Journal of the Hong Kong College of
CARDIOLOGY

HONG KONG

Including Abstracts of
8th Asian Preventive Cardiology and
Cardiac Rehabilitation Conference
28-29 November 2020

Journal of the Hong Kong College of Cardiology

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Validation of the Specific Activity Scale Hong Kong Chinese Version Among Chinese Patients with Heart Diseases

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CHAN ET AL.: *Validation of the Specific Activity Scale Hong Kong Chinese Version among Chinese Patients with Heart Diseases. Background: The interview-based Specific Activity Scale classified cardiac patients into four functional classes based on ability in performing the specific activities with symptom consideration. This tool is widely used by occupational therapist in evaluating the functional performance in cardiac rehabilitation program but it has not been translated into Chinese language. Objective: The objective is to study concurrent validity and test-retest reliability of the Specific Activity Scale Hong Kong Chinese version (SASHKCV) on patients with heart diseases in Hong Kong. Methods: This was a prospective study where cardiac patients were recruited in day cardiac rehabilitation centres. SASHKCV was conducted twice within 7 days. Metabolic Equivalent (MET) in stress test was collected within study period. Results: 179 patients had completed the SASHKCV and stress test. Patients with recent Myocardial Infarction (MI) during initial assessment were classified as MI group. The other patients were sorted into non-MI group. The results of the test-retest reliability of the MI group was 0.948 (p<0.001), and that of the non-MI group was 0.933 (p<0.001). Total group correlation was 0.944 (p<0.001). Furthermore, the correlation between the functional class of SASHKCV and MET in MI group was 0.459 (p<0.001) and non-MI group was 0.536 (p<0.001). Overall correlation coefficient was 0.496 (p<0.001). Conclusion: SASHKCV is a valid and reliable tool in evaluating the functional performance of cardiac patients. There is a moderate correlation between the functional class of SASHKCV and MET achieved from stress test. (J HK Coll Cardiol 2020;28:51-58)*

Cardiac Rehabilitation, Functional Capacity, Metabolic Equivalent, Occupational Therapy, Outcome Measure, Specific Activity Scale

摘要

背景：活動功能級別量表是一份訪談式評估，根據心臟病患者進行特定活動的能力和症狀分為四個功能級別，該評估已被職業治療師廣泛應用於心臟復康計劃，但尚未曾翻譯成中文。目的：目的是研究《活動功能級別量表香港版本》（ＳＡＳＨＫＣＶ）對香港心臟病患者的同時效度和重測信度。方法：這是一項前瞻性研究，在心臟日間復康中心招募心臟病患者，於七天內進行兩次 ＳＡＳＨＫＣＶ 在研究期內收集了負苛測試中的代謝當量。結果：１７９名患者完成了評估和負苛測試，在初次評估診斷為心肌梗塞的患者分為心肌梗塞組（ＭＩ組），其他心臟病患者則為非心肌梗塞組(non-MI組)。MI組的重測信度為0.948 (p<0.001)，而non-MI組的重測信度為0.933 (p<0.001)，整體得分0.944 (p<0.001)；此外MI組中SASHKCV功能級別和MET的相關性為0.459 (p<0.001)，而non-MI組是0.536 (p<0.001)，整體相關係數為0.496(p<0.001)。結論：SASHKCV是一份評估心臟病患者功能表現的可靠量度工具，ＳＡＳＨＫＣＶ 的功能級別和負苛測試的MET之間存在適量的相關性。

心臟復康、功能能力、代謝當量、職業治療、療效指標、活動功能級別量表

Introduction

Cardiovascular disease (CVD) is one of the major causes of morbidity and mortality in the world.[1] In Hong Kong, it was ranked the top three killer disease which accounted for 3,769 (7.9%) of all registered deaths in 2018.[2] CVD is largely preventable through modification of risks factors and appropriate treatment.[3] Therefore, Hospital Authority, the major public medical service provider in Hong Kong, formulated strategies in medical treatment and related supportive services such as cardiac rehabilitation programs.[4] Measurement of capacity of cardiovascular function is highly important in clinical management which provided reference for making clinical decision and risk stratification for cardiac patients. Functional capacity can be measured by stress test of aerobic capacity such as treadmill,[5] while functional performance was measured by scales. There is no unique evaluation or assessment that can provide definite measure and reference of capacity of cardiovascular system.[6] Apart from functional capacity evaluation, functional performance determined by questionnaire can be used to stratify the patients.[7] Specific Activity Scale (SAS) was designed in 1981 by Goldman.[8] The interview-based SAS is a set of standardized questions about activities of daily living. Similar to New York Heart Association (NYHA) classification,[9] SAS classifies cardiac patients into four functional classes based on their abilities in performing the specific activities with symptom consideration. Each class represents activities corresponding a specific range of Metabolic Equivalent (MET). This tool is used by occupational therapists to estimate the capacity of cardiac patients according to their functional performances. SAS has not been translated into Chinese language. Therefore, the aim of the current study was to cross-culturally validate the translated Specific Activity Scale Hong Kong Chinese Version (SASHKCV) (Appendix 1). In particular, the concurrent validity and test-retest reliability of the SASHKCV on patient with heart diseases in Hong Kong were studied.

Methodology

This was a prospective study in concurrent validities and test-retest reliability of SASHKCV on patients with heart diseases in Hong Kong. Having obtained the endorsement from Professor Lee Goldman from Columbia University, SAS was translated into Chinese in 2016. An expert panel with 10 occupational therapists specialized in cardiac rehabilitation for more than 10 years' experiences from 7 Hospital Authority clusters in Hong Kong had been formed to review the SAS and translated it into SASHKCV with the consideration of the cultural relevance to Hong Kong population. This Chinese translated version was then undergone backward translation to English by a graduate of Linguistics and Translation from a local university. The backward translated version was almost 100% agreed with the original version without distorting the meaning and nature of the activity. Day-patients and out-patients with heart diseases were recruited from 5 cardiac rehabilitation centres in Hong Kong between July and September 2016. These centres provide standardized and structural cardiac rehabilitation program, which cover more than 50% of cardiac rehabilitation service in Hong Kong. The inclusion criteria were: (1) proficiency in Chinese language for reading, listening and speaking; (2) attend day or out-patient cardiac rehabilitation services; (3) stable in cardiovascular condition without significant sign and symptoms. Subjects who are unable to communicate in Chinese and have cognitive deficiencies were excluded. Those subjects with in-complete set of data also not be studied. The subjects were classified into two groups: Myocardial Infarction (MI) group and non-Myocardial Infarction (non-MI) group. MI group included patients recently diagnosed with myocardial infarction during the initial assessment while non-MI group included patients with other cardiac conditions such as congenital heart disease, heart failure, arrhythmia and valvular heart disease. All subjects were interviewed with the SASHKCV by an occupational therapist during initial assessment. Formal consent was obtained to ensure all the subjects understood the purpose and potential risk in this study. Ethics approvals were obtained from the Institutional Review Board of the University of Hong Kong, the Chinese University of Hong Kong and the Hospital Authority Clinical Research Ethics Committee (IRB reference no. UW17-221) which included all study clusters in Hospital Authority. The first SASHKCV was collected at initial assessment and the second

collection will be within 7 days by phone. The data collection period was 3 months. MET will be retrieved from stress test during this study period. The stress test was usually performed in a graded walking protocol in treadmill. The results obtained was then analyzed by using the Intraclass Correlation Coefficient (ICC) for test-retest reliability. It was also used to investigate the correlation between functional class from SASHKCV and achieved MET by Analysis of Variance (ANOVA). Both statistical tests were performed by using SPSS version 22.

Result

There were 252 patients recruited from 5 cardiac rehabilitation centres. During the period of data collection, some of the cases without the stress test result or with missing data were excluded. Therefore, the total population for study remained as 179 which composed of 132 (73.7%) male and 47 (26.3%) female. The age range was 30 to 87 with mean age 62.5±11.3. The MET achieved in this study population was ranged from 1.5 to 15.8 with mean 6.13±2.93. The total population was divided into MI group in which 124 (69.3%) patients with recent principal diagnosis with MI and non-MI group in which 55 (30.7%) patients with valvular disease, heart failure and other cardiac condition. In MI group, there were 102 (82.3%) male and 22 (17.7%) female with age ranging from 30 to 87 (mean age 62.0±11.8). The MET was ranged from 1.5 to 15.8 (mean 6.55±2.98). In the non-MI group, there were 30 (54.5%) male and 25 (45.5%) female with age ranging from 37 to 84 (mean age 63.5±10.2). The MET was ranged from 1.7 to 10.5 (mean 5.16±2.59) (Table 1). The ICC obtained from the total population, MI group and non-MI group were as 0.944, 0.948 and 0.933 respectively. All the results were significant and indicated very high level reliability. Therefore, the SASHKCV can be applied in most of different cardiac conditions (Table 2). The mean values MET of functional class I, II, III and IV obtained in total population were 8.4, 6.1, 4.0 and 2.1 respectively. From the ANOVA, these four classes have distinct differences from each other in terms of MET levels. All these results were significant with p value <0.001 (Table 3). Comparing MET achieved to SASHKCV functional classes, moderate significant positive correlations were observed. The Pearson Correlation Coefficient in total population, MI group, non-MI group were -0.496, -0.459 and -0.536 respectively. Positive correlation implied higher functional class achieved higher MET level. Negative values were obtained as class I has a higher function than class IV. This implied that class I has a higher achieved MET than class IV (Table 4).

Discussion

In SASHKCV, the activity content was not altered. Although tasks like shovel snow and skiing are not relevant in Hong Kong, a person might perform these activities outside Hong Kong during vacation. The assessment tool might also be applied to Chinese in Mainland China living in mid-north region with snowy weather. Furthermore, the completion of the level was counted from any one of the many activities in the activity list. The activity 'shovel snow' was still applicable to the Chinese population. During the translation process of the SAS scale, the working group standardized the process performed in normal circumstance. The translated version can eliminate variations among therapists' interpretation

Table 1. Demographic characteristics of study population

Characteristics	Mean	SD
Total population n=179		
Age	62.5	11.3
Male 132 (73.7%)	60.9	10.7
Female 47 (26.3%)	66.8	12.0
MET	6.13	2.93
MI group n=124		
Age	62.0	11.8
MET	6.55	2.98
Non-MI group n=55		
Age	63.5	10.2
MET	5.16	2.59

SD: Standard Deviation; MI: Myocardial Infarction, MET: Metabolic Equivalent

Table 2. Test-retest reliability of the SASHKCV

Overall subject (n=179)		SASHKCV test				Total
		1.0	**2.0**	**3.0**	**4.0**	
SASHKCV retest	1.0	32	2	0	0	34
	2.0	3	107	3	0	113
	3.0	0	1	27	0	28
	4.0	0	0	0	4	4
Total		35	110	30	4	179

ICC(3,k) absolute agreement is 0.944 with p<0.001
Chi square x^2=475.382, df=9, p<0.001
Pearson correlation r=0.944, p<0.001

MI group (n=124)		SASHKCV test				Total
		1.0	**2.0**	**3.0**	**4.0**	
SASHKCV retest	1.0	27	1	0	0	28
	2.0	1	73	2	0	76
	3.0	0	1	19	0	20
	4.0	0	0	0	0	0
Total		28	75	21	0	124

ICC(3,k) absolute agreement is 0.948 with p<0.001
Chi square x^2=214.322, df=4, p<0.001
Pearson correlation r=0.948, p<0.001

Non MI group (n=55)		SASHKCV test				Total
		1.0	**2.0**	**3.0**	**4.0**	
SASHKCV retest	1.0	5	1	0	0	6
	2.0	2	34	1	0	37
	3.0	0	0	8	0	8
	4.0	0	0	0	4	4
Total		7	35	9	4	55

ICC(3,k) absolute agreement is 0.933 with p<0.001
Chi square x^2=132.0, df=9, p<0.001
Pearson correlation r=0.932, p<0.001

SASHKCV: Specific Activity Scale Hong Kong Chinese Version; MI: Myocardial Infarction

and to enhance administration of SASHKCV by patients themselves. For example, a patient is required to perform stair climbing without holding a handrail and perform the tasks in an appropriate duration about 10 minutes. Furthermore, the distance and weights in metric system had been added together with imperial system in SASHKCV. In other words, pound (lb) and kilogram (kg) were stated together same as mile per hour (mph) and kilometer per hour (km/h) were listed together to facilitate interpretation according to the systems used in

the society. At the same time, standardization may help to reduce variations between therapists in conducting SASHKCV. MET is commonly used to describe the functional capacity of cardiac patients.[10] Since many activities in self-care, household, occupation, leisure and sports were calibrated with MET values, the calibrated MET can be used to compare achieved MET of patient.[11] The results obtained are used in activity prescription for cardiac patients in order to resume daily living demand after cardiac events.[12] In general, patients are able to cope

Table 3. Achieved MET in the SASHKCV classes

SASHKCV Class		MI group (n=124) MET level		Non-MI group (n=55) MET level		Total (n=179) MET level	
		Mean	SD	Mean	SD	Mean	SD
I.	Patient can perform to completion any activity requiring 7 METs	1.0	8.6	3.21	7.3	2.91	8.4	3.15
II.	Patient can perform to completion any activity requiring 5 METs but cannot or does not perform to completion activities requiring 7 METs	2.0	6.4	2.44	5.5	2.38	6.1	2.45
III.	Patient can perform to completion any activity requiring 2 METs but cannot or does not perform to completion any activities requiring 5 METs	3.0	4.3	2.66	3.3	1.27	4.0	2.35
IV.	Patient cannot or does not perform to completion activities requiring 2 METs	4.0	0	0.00	2.1	0.35	2.1	0.35
p value			<0.001*		<0.001*		<0.001*	

*test of difference among the 4 classes of SASHKCV by ANOVA
MET: Metabolic Equivalent; SASHKCV: Specific Activity Scale Hong Kong Chinese Version; MI: Myocardial Infarction

Table 4. Pearson correlation coefficient between SASHKCV and achieved MET

	MI group (n=124)	Non-MI group (n=55)	Total (n=179)
Pearson correlation coefficient	-0.459*	-0.536*	-0.496*

*p<0.001
SASHKCV: Specific Activity Scale Hong Kong Chinese Version; MET: Metabolic Equivalent; MI: Myocardial Infarction

with those activities within the achieved MET in stress test.[13] The activities in SASHKCV were well defined in actual requirement such as the pacing and loading for patient to make accurate judgement and valid data from medical professional as reference. It had collective activities in certain MET range, any one of these activities performed means the patient's functional capacity could be achieved. Activities such as walking in different speed and weight carrying were common in daily life. During daily practice, not every patient is arranged for the functional capacity evaluation due to limited resources, time cost and professional staff requirements. The advantages of the self-reported test are that it is easily administered and low costing in terms of manpower. Another benefit is that it is more realistic to patient's daily life role and actual performance in daily living activities. On the other hand, functional performance questionnaire is a complimentary assessment with objective evaluation. For example, some cases may be afraid of treadmill test due to various musculoskeletal issues such as knee pain or not habituated to the treadmill. The performance might be underestimated and therefore medical professionals were unable to obtain accurate references. Stress test was still valuable because the ECG could be recorded during the test while the SASHKCV could not provide this ECG information.[14] As a result, stress test and questionnaire in capacity were complimentary in clinical evaluation. The SASHKCV could be used for risk stratification in clinical evaluation. Patients with cardiac diseases were classified into four different functional levels. If the patient reported that he or she can perform class I activities, that meant the MET level estimated was 7 or above. Each class represented a specific range of MET level. The classification could facilitate therapists in planning more specific and tailor-made treatment to patients; and provide supplementary data for functional performance evaluation. SASHKCV is a self-report questionnaire and can be performed in phone interview or tele-media. Therefore, assessment could be performed during situations like pandemic of COVID-19 where most services were suspended and reduced social contact. Therapists could provide safety advice in dealing with patient's daily work demand

according to the functional class as each class resembling a specific range of MET. Therefore, the accuracy and safety in activity prescription could be enhanced. As a result, SASHKCV served as assessment and outcome measure for tele-rehabilitation service if the patient had the difficulty in access of cardiac rehabilitation service, especially for those living far away from the centre. Pre and post phone interview can be adopted to estimate the outcome of the rehabilitation program or over a period of time. Our results showed that the SASHKCV is a valid, reliable and standardized functional assessment tool. The test re-test reliability of the SASHKCV was very high especially for the MI group. Even the non-MI group had mixed cardiac conditions, the test-retest was also satisfactory. This indicated that it is a reliable tool can be applied to various cardiac conditions. The correlation between the SASHKCV and exercise stress testing was moderate in magnitude. This result was expected and similar to the original version of SAS, as well as other functional assessment tools such as 6-minute walk test.[15] Similar correlations was also obtained from the validation study on NYHA classification.[16] The discrepancy might be attributed to the difference between functional capacity tests and the actual functional performance. From clinical observation, some participants were not accustomed to the stress test in a laboratory environment, whereas SASHKCV measures the functional performance that a person actually performed in real life situations in accordance with the metabolic expenditure values of those activities. However, results of a self-reported SASHKCV might be affected by various factors such as self-interpretation of symptoms and self-report in completion of functional activities. A moderate correlation between functional class and MET was expected. To conclude, both evaluation methods were adopted in rehabilitation program in order to reflect the true capacity by supplementing each other. For the correlational study between functional class and MET, the actual time of treadmill test was not used. It is because there are many different protocols for the treadmill test such as Bruce and modified Bruce. Different stages are set in different protocols. For

example, Bruce has fewer stages than modified Bruce to reach the same speed and inclination of the treadmill. MET was used in correlation with functional class rather than duration of time. In this study, we separated the patients into two groups like the MI group contributing most of subjects. The other group was non-MI group with different heart related diseases including congenital heart disease, heart failure, arrhythmia, valvular heart disease. It was recommended to recruit more other specific patient groups, for example, congestive heart failure, atrial fibrillation or valvular heart disease for further study. Although the results of the mixed group were sound and significant, more differentiation in diagnostic groups could be tested to provide more precise results. Moreover, the number of subjects in class IV of SASHKCV was comparatively small. This might be due to the accessibility of rehabilitation for low functional level patients was comparatively difficult than those with higher functional level. They might not be referred as the travelling difficulty. Sometimes they also need companion of family members, this will hinder low functional patient to access rehabilitation service. The limited number in class IV could be one of the limitation to achieve better correlation between functional class and MET achieved. Our study has another limitation. For example, the number of patients in each class was not balanced which was relatively low in class IV. Further larger scale study may develop better generalization to the usage of the SASHKCV.

Conclusion

This study demonstrated that the SASHKCV is a valid and reliable tool to assess the functional performance of Chinese people with various cardiac diseases. It is an easy self-administered evaluation tool with cultural relevance to the local population. SASHKCV can help clinicians retrieve more precise and comprehensive information regarding the onset of cardiovascular symptoms during the performance of daily activities in real life situations. It can also serve as an outcome measure for cardiac rehabilitation, and a quick reference on the impact of cardiac diseases on daily activities.

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Appendix 1: 活動功能級別量表香港版本 (Specific Activity Scale Hong Kong Chinese Version, SASHKCV)

	能夠 （任何一項）	不能夠
1. 你能否行落一層樓梯而不需要停頓？(4.2-5.2 METs)	往第2題	往第4題
2. 你能否攜帶任何物品上一層八級樓梯而不需要停頓？(5-5.5 METs) 或你能否： (a) 進行性行為 (5-5.5 METs） (b) 進行園藝、耙泥、除草 (5.6 METs) (c) 進行滾軸溜冰、狐步舞 (5-6 METs) (d) 以時速4英里／6.4公里在平地步行 (5-6 METs)	往第3題	第三級別
3. 你能否提起最少24磅／10.9公斤重的物件上八級樓梯？(10 METs) 或你能否： (a) 提起最少80磅／36.4公斤重的物件（8 METs） (b) 進行戶外工作，如鏟泥、鏟雪 (7 METs) (c) 進行消閑活動，如籃球、足球、壁球、手球、滑雪 (7-10 METs) (d) 以時速5英里／8公里急步走或緩步跑 (9 METs)	第一級別	第二級別
4. 你能否洗澡而不需要停頓？(3.6-4.2 METs)或你能否： (a) 收拾及整理床舖 (3.9-5 METs) (b) 拖地 (4.2 METs) (c) 掛起已洗的衣服 (4.4 METs) (d) 抹窗 (3.7 METs) (e) 以時速2.5英里／4公里步行 (3-3.5 METs) (f) 打保齡球 (3-4.4 METs) (g) 打哥爾夫球(包括步行及帶著球杆) (4.5 METs) (h) 推動電動割草機 (4 METs)	第三級別	往第5題
5. 你能否穿衣服而不會因病徵而停下來？(2-2.3 METs)	第三級別	第四級別

活動功能級別量表（級別標準）

第一級別　　病患者能完成任何代謝當量≥7的活動
第二級別　　病患者能完成任何代謝當量≥5的活動，但未能完成或沒有進行任何代謝當量≥7 的活動
第三級別　　病患者能完成任何代謝當量≥2的活動，但未能完成或沒有進行任何代謝當量≥5 的活動
第四級別　　病患者未能完成或沒有進行任何代謝當量≥2 的活動

註：METs代謝當量

Proceedings of
8th Asian Preventive Cardiology
and
Cardiac Rehabilitation Conference

28-29 November 2020
Hong Kong
(Virtual Conference)

Cardiovascular Disease Management and Cardiac Rehabilitation
in the Era of COVID-19 Pandemic

Organized by
Hong Kong College of Cardiology

Supported by
Asian Pacific Society of Cardiology
Care for Your Heart
Centre on Behavioral Health, The University of Hong Kong
College of Nursing, Hong Kong
Department of Health, Hong Kong SAR
Grantham Hospital
Hong Kong Association of Rehabilitation Medicine
Hong Kong Cardiac Nursing Association Limited
Hong Kong College of Cardiac Nursing
Hong Kong Dietitians Association
Hong Kong Heart Foundation Limited
Hong Kong Nutrition Association Ltd.
Hong Kong Occupational Therapy Association
Hong Kong Physiotherapy Association Limited
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In the treatment of patients with type 2 diabetes and established
CV disease receiving standard of care,[†‡§] **CV death can strike at any time**

BATTLE CV DEATH NOW
MORE THAN EVER[§]

**JARDIANCE demonstrated
38% RRR in CV death[1,2]**

Established HbA1c efficacy[2]

Demonstrated safety profile[1,2]

Convenient, once-daily oral dosing[2]

ADA & EASD recognize JARDIANCE
as the SGLT2 inhibitor with stronger
evidence of CV benefits[3#]

Jardiance®
(empagliflozin)

CV: cardiovascular; RRR: relative risk reduction; ADA: American Diabetes Association; EASD: European Association for the Study of Diabetes; CVD: cardiovascular disease; OAD: oral antidiabetic drug; T2DM: type 2 diabetes mellitus

Reference: 1. Zinman B, et al. N Engl J Med, 2015:373(22): 2117-2118. 2. Jardiance Hong Kong Prescribing Information. 3. Davies MJ, D'Alessio DA, Fradkin J,et al. Management of hyperglycaemia in type 2 diabetes. 2018. A consensus report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). Diabetologia. 2018.

† JARDIANCE demonstrated RRR in CV death in adult patients with insufficiently controlled type 2 diabetes (baseline HbA1c 7-10%) and established CV disease (coronary artery disease, peripheral artery disease, or a history of myocardial infarction or stroke).[1]

‡ Standard of care included CV medications and glucose-lowering agents given at the discretion of physicians.[1]

§ Empagliflozin versus placebo on top of standard of care.[1]

Management of hyperglycemia in type 2 diabetes, 2018. A consensus report by the ADA and EASD stated that among patients with established CVD, there is likely cardiovascular benefit, with the evidence of benefit modestly stronger for empagliflozin than canagliflozin[3]

JARDIANCE® Abbreviated Prescribing Information (aPI-JAR-12-13-V1 R1)

Presentation: Empagliflozin. Film-coated tablets 10 mg; 25 mg. **Indications:** Indicated in the treatment of type 2 diabetes mellitus to improve glycaemic control in adults as: monotherapy when diet and exercise alone do not provide adequate glycaemic control in patients for whom use of metformin is considered inappropriate due to intolerance; and as add-on combination therapy with other glucose-lowering medicinal products including insulin, when these, together with diet and exercise, do not provide adequate glycaemic control. Indicated in patients with type 2 diabetes mellitus and established cardiovascular disease to reduce the risk of cardiovascular death. **Dosage and administration:** 10 mg once daily. In patients tolerating 10 mg once daily and requiring additional glycaemic control, the dose can be increased to 25 mg once daily. Can be taken with or without food. No dose adjustment is required for patients with eGFR ≥ 45mL/min/1.73m² or with hepatic impairment, or for elderly patients. **Contraindication:** Hypersensitivity to empagliflozin or any of the excipients. Patients on dialysis, eGFR <30mL/min/1.73m² or CrCl <30mL/min, or eGFR persistently <45mL/min/1.73m² or CrCl persistently <45mL/min. Rare hereditary conditions that may be incompatible with an excipient. **Special warnings and precautions:** Should not be used in patients with type 1 diabetes or for treatment of DKA. Discontinue immediately when DKA is suspected or diagnosed. Treatment should be interrupted in patients who are hospitalised for major surgical procedures or acute serious medical illnesses, and may be restarted once the patient's condition has stabilised. Discontinue when the eGFR is persistently <45mL/min/1.73m² or CrCl <45mL/min. Discontinue in cases of recurrent UTI. Due to a risk of modest decrease in blood pressure, caution should be exercised in patients with known cardiovascular disease, patients on diuretics, patients with history of hypotension or patients aged 75 years and older. Monitoring of volume status and electrolytes is recommended. Regularly examine the feet and counsel patients on routine preventative footcare. Caution is advised in patients at increased risk of genital infections. Avoid use during pregnancy and breast-feeding. Safety and effectiveness in children under 18 years of age have not been established. Initiation is not recommended in patients aged 85 years and older. Urine will test positive for glucose while patients are taking JARDIANCE. **Interactions:** Risk of dehydration and hypotension may increase when used in combination with thiazide and loop diuretics. Lower dose of insulin or an insulin secretagogue may be required to reduce the risk of hypoglycemia when used in combination with JARDIANCE. **Adverse reactions:** Hypoglycaemia (depends on type of background therapy of patients); Urinary tract infection, vaginal moniliasis, vulvovaginitis, balanitis and other genital infection; Increased urination, dysuria; Pruritus; Volume depletion; Thirst; Glomerular filtration rate decreased, blood creatinine increased, haematocrit increased, serum lipids increased. Post-marketing experience: Ketoacidosis, urosepsis, pyelonephritis, necrotising fasciitis of the perineum (Fournier's gangrene), allergic skin reaction, angioedema. **Storage condition:** Please refer to outer packaging for special precautions for storage. **Note:** Before prescribing, please consult full prescribing information.

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THE ONLY
OAD WITH CV
INDICATION

Jardiance is indicated in
**T2DM patients and established
cardiovascular disease** to
reduce the risk of
cardiovascular death[1]

8th Asian Preventive Cardiology and Cardiac Rehabilitation Conference

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Keynote Speaker: Prof. Salim VIRANI
Professor of Medicine, Baylor College of Medicine, United States
Chair, Prevention of Cardiovascular Disease Council, American College of Cardiology

Prof. Sherry GRACE
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Mr. Dennis FUNG	Mr. Samson LI	Ms. Christina YAU
Prof. Alice Pik-Shan KONG	Mr. Alex LO	Prof. Cheuk-Man YU

Scientific Programme

Saturday, 28 November 2020

Room 1

0930-1130 **Symposium 1**
Cardiac Rehabilitation in Heart Failure Symposium
Chairpersons: Yu-ho Chan, Leonard Li

Invasive Hemodynamic Exercise Assessment in Heart Failure with Preserved Ejection Fraction	Ssu-Yuan Chen
Adaptation of Cardiac Rehabilitation in Hong Kong Amidst the COVID-19 Outbreak	Leonard SW Li
Model of Pulmonary Rehabilitation for Chronic Heart Failure	Mohamad Yatim Saari
Cardiac Rehabilitation in Heart Failure	Shigeru Makita

1130-1200 Break / Exhibition / e-Poster Presentation

1200-1245 **Symposium 2**
Hong Kong Heart Foundation Symposium
Chairpersons: Ngai-yin Chan, Kathy Lee

How Do We Assess, Personalize, Reclassify and Communicate Atherosclerotic Cardiovascular Risk?	Salim Virani

1300-1400 **Lunchtime Symposium**
Chairpersons: Chu-pak Lau, Albert Leung

Renal Outcome of NOAC: An Asian Perspective	Alex PW Lee

1400-1415 **Opening Ceremony**

1415-1620 **Symposium 3**
Heart Failure Symposium
Chairpersons: Katherine Fan, Godwin Leung

Contemporary Holistic Care for Heart Failure Patients: From Drugs to Rehabilitation	Ngai-yin Chan
New Insights on SGLT2i for HFrEF Management: The EMPEROR-Reduced Study	Stefan Anker
Heart Failure: From Prevention to Treatment through SGLT2 Inhibition	Cheuk-man Yu
Managing Hyponatremia in Advanced Heart Failure	Cheuk-chun Szeto
Emerging Data in Heart Failure: Are We Doing Enough for Our Patients?	Martin Cowie

1620-1630 Break / Exhibition / e-Poster Presentation

1630-1730 **Symposium 4**
Hypertension and AF Symposium
Chairpersons: Adrian Cheong, Bernard Cheung

AF Management with Anticoagulation in the Era of COVID-19 Pandemic	So-ryoung Lee
In Case You Have Missed It: What Is Happening Lately in Renal Denervation?	Cho-shan Li

Room 2

0900-1030 **Oral Abstract Presentation**
Chairpersons: Ronnie Chan, Ngai-shing Mok

Apabetalone Reduces Alkaline Phosphatase: A Meta-analysis	Hang-long Li
Home-based Cardiac Tele-rehabilitation during COVID-19-Early Preliminary Experience for Post Cardiac Surgery Patients in Hong Kong	Katherine Fan
The Effects of Maintenance Cardiac Rehabilitation: A Systematic Review and Meta-analysis	Mohiul Chowdhury
Cardiac Rehabilitation Component Attendance, and Impact of Intervening Clinical Events, as well as Disease Severity and Risk Factor Burden	Taslima Mamataz
Right Ventricular Function, Mechanical Ventilation Duration, and ICU Length of Stay in Heart Valve Surgery Patients Underwent Preoperative Inspiratory Muscle Training	Hari Hendriarti Satoto
The Effects of Smartphone-based Cardiac Rehabilitation Program for Percutaneous Coronary Intervention Patients in Macau	Sarah SW Lao
Exercise Training in Patients with Implanted Ventricular Assist Devices	Na Zhou
Degree of Emphasis on Cardiac Rehabilitation in Online Health Information	Jooyoung Moon
Effects of Intradialytic Exercise Training on Functional Capacity and Quality of Life among Hemodialysis Patients at a Tertiary Cardiac Center in the Philippines	Lilian Ville Bacalso

1030-1100 Break / Exhibition / e-Poster Presentation

1100-1230 **Best Abstract Presentation**
Chairpersons: Bernard Cheung, Iris Kwan
Judges: Kam-tim Chan, Chung-seung Chiang, Ngai-shing Mok

Effectiveness of Technology-Assisted Cardiac Rehabilitation: A Systematic Review and Meta-Analysis	Mei-sin Chong
The Effect of Mobile Phone-based Interventions for Controlling Blood Pressure in Patients with Uncontrolled Hypertension Grade II	Niyata Hananta Karunawan
Association Between Acute Hyperglycemia and Fatal Arrhythmia in Previously Diabetic Patients With STEMI	Surenjav Chimed
Recent Trends in Out-of-Hospital Cardiac Arrest (OHCA) Outcomes in Singapore in the Era of COVID-19	Qin-xiang Ng
The Benefits of Home Based Telemonitored Cardiac Rehabilitation Exercise Program Among Patients with Reduced Ejection Fraction Heart Failure: Its Significance on COVID-19 Pandemic	Vienna Rosalinda
What Factors That Elderly Patients with Heart Failure 90 Years Old Or More Should Obtain Due To Get Their Independence Gait for 50m Continuous?	Satoru Hanada

1230-1400 Lunch Break / Exhibition / e-Poster Presentation

1400-1530 **Cardiac Rehabilitation & COVID-19 "Virtual Reality" Session: Workshop for Allied Healthcare Providers**
Chairpersons: Dick Cheng, Raymond Fung, Catherine PG Shea

Evidence-based Review on Intermittent Fasting Diet	Andrea Chan
Health Break - Stretches	Arthur Cheung
Overview of the Impact of COVID-19 on Cardiac Rehabilitation in Asia	Swee-yaw Tan Yutaka Kimura Carmen Chan
Health Break - Get Active	Arthur Cheung

1530-1600 Break / Exhibition / e-Poster Presentation

1600-1730	**Cardiac Rehabilitation & COVID-19 "Virtual Reality" Session:**	
	Workshop for Allied Healthcare Providers	
	Chairpersons: Dick Cheng, Raymond Fung, Catherine PG Shea	

	How Technologies Break the Communication Gap? (I): Gadgets/Wearing Devices	David Siu
	Health Break - Have You Laughed Yet Today?	Alex Lo
	How Technologies Break the Communication Gap? (II)	Dennis Fung
		Samson Li

Sunday, 29 November 2020

Room 1

0900-1100	**Symposium 5**	
	Cardiac Rehabilitation & COVID-19 Symposium	
	Chairpersons: Carmen Chan, Raymond Fung, Patrick Ko	
	ICCPR's Global Cardiac Rehabilitation Program Survey on COVID Impacts	Sherry Grace
	Cardiac Rehabilitation in Japan during COVID-19 Epidemic	Shigeru Makita
	Cardiac Considerations for Return to Sports Amidst COVID-19	Tee-joo Yeo
	Cardiovascular, Pulmonary and Neuromuscular Involvement in COVID-19 and its Management	Farzaneh Torkan

1100-1130	Break / Exhibition / e-Poster Presentation	

1130-1230	**Symposium 6**	
	Lipid Symposium	
	Chairpersons: Chun-ho Cheng, Yuk-kong Lau, Kin-lam Tsui	
	Is Atherosclerosis an Inflammatory or a Cholesterol Disorder?	Salim Virani
	Current Lipid-lowering Therapy Landscape Review and the APSC Consensus Statement	Jack WC Tan

1230-1400	Lunch Break / Exhibition / e-Poster Presentation	

1400-1530	**Symposium 7**	
	e-Cardiac Rehabilitation Symposium	
	Chairpersons: Kwok-keung Chan, Eddie Chow, Peter Wong	
	Tele-cardiac Rehabilitation Medicine: A New Frontier or a False Dawn	Swee-yaw Tan
	Cardiac Rehabilitation Using Wearables	Jong-young Lee
	Mobile App for High-risk Patients	Visal Kantaratanakul

1530-1600	Break / Exhibition / e-Poster Presentation	

1600-1730	**Symposium 8**	
	Cardiovascular Risk Factors Symposium	
	Chairpersons: David Lo, Thomas Tunggal	
	Current Understanding on Mental Stress-induced Myocardial Ischaemia	Lan Guo
	Management of People with Diabetes and Cardiovascular Diseases - What's New?	Alice PS Kong
	Diagnostic and Therapeutic Considerations to Tailor Treatments for Angina Patients	Mario Marzilli

1730-1740	**Closing Remarks**	Leonard SW Li

Room 2

1230-1400   Lunch Break / Exhibition / e-Poster Presentation

1400-1530   **Cardiac Rehabilitation & COVID-19 "Virtual Reality" Session:**
             Workshop for Allied Healthcare Providers
             Chairpersons: Man-chun Choi, Shu-kin Li, Sunny CF Tsang

          How to Exercise Safely in an Increasingly Challenging Pandemic Environment?   Gary Mak
          Health Break - Stretches   Christina Yau
          Special Patient Group (I):   Ka-lam Wong
          Cardiac Rehabilitation in Patients with Heart Failure
          Health Break - Stay Active   Christina Yau

1530-1600   Break / Exhibition / e-Poster Presentation

1600-1715   **Cardiac Rehabilitation & COVID-19 "Virtual Reality" Session:**
             Workshop for Allied Healthcare Providers
             Chairpersons: Man-chun Choi, Shu-kin Li, Sunny CF Tsang

          Special Patient Group (II):   Ting-ting Low
          Coronary Heart Disease in Women; Y Does X Make a Difference?
          Health Break - Heart Imagery Exercise for Relaxation   Nora Leung
          COVID-19 Pandemic: We Connected!   Tee-joo Yeo

公眾研討會 Public Lecture Programme

日期：2020 年 11 月 29 日
時間：上午 9 時 30 分至上午 11 時 30 分
對象：心臟病患者及其家屬

0930   開幕典禮   李常威醫生

0935-1030   新冠肺炎：心臟病患者是高危一族？   曾振峯醫生
           (伊利沙伯醫院內科
           副顧問醫生)
           佘佩芝醫生
           (瑪麗醫院心臟科
           副顧問醫生)

1030-1130   運動抗疫護身心   曾振峯醫生
           (伊利沙伯醫院內科
           副顧問醫生)
           佘佩芝醫生
           (瑪麗醫院心臟科
           副顧問醫生)

          起動！齊運動   張秀儀小姐
           (香港複康會適健中心
           一級物理治療師)

Pradaxa®
dabigatran etexilate

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THEIR FUTURES
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CONFIDENCE[1-3]
with vetted global evidence

REVERSIBILITY[4]
in facing emergency situation

PROTECTION[5-6]
for extended medical condition

Abbreviated Prescribing Information PRADAXA® (aPI PRA 19 locrev1, 21 locrev1 V1)
Presentation: Dabigatran etexilate (Hard Capsules: 75mg, 110mg, 150mg). Indications: Prevention of stroke and systemic embolism in adult patients with non valvular atrial fibrillation (NVAF), with one or more risk factors, such as prior stroke or transient ischemic attack (TIA): age ≥ 75 years; heart failure (NYHA Class ≥ II); diabetes mellitus; hypertension. **Dosage and administration:** The recommended daily dose of PRADAXA® is 300 mg taken as one 150 mg capsule twice daily. Therapy should be continued long term. For patients aged ≥80 years or patients who receive concomitant verapamil, the recommended daily dose of PRADAXA® is 220 mg taken as one 110 mg capsule twice daily. For the patients aged between 75-80 years, patients with moderate renal impairment, patients with gastritis, esophagitis or gastroesophageal reflux or other patients at increased risk of bleeding, the daily dose of PRADAXA® is 300 mg or 220 mg and should be selected based on an individual assessment of the thromboembolic risk and the risk of bleeding. Patients can stay on PRADAXA® while being cardioverted. Catheter ablation can be conducted in patients on 150 mg twice daily PRADAXA® treatment and PRADAXA® treatment does not need to be interrupted. Patients with NVAF who undergo a percutaneous coronary intervention (PCI) with stenting can be treated with PRADAXA® in combination with antiplatelets after haemostasis is achieved. **Contraindication:** Hypersensitivity to the active substance or to any of the excipients. Patients with severe renal impairment (CrCL < 30 mL/min). Active clinically significant bleeding. Lesion or condition, if considered a significant risk factor for major bleeding, which may include current or recent gastrointestinal ulceration, presence of malignant neoplasms at high risk of bleeding, recent brain or spinal injury, recent brain, spinal or ophthalmic surgery, recent intracranial haemorrhage, known or suspected oesophageal varices, arteriovenous malformations, vascular aneurysms or major intraspinal or intracerebral vascular abnormalities. Concomitant treatment with any other anticoagulants e.g. unfractionated heparin (UFH), low molecular weight heparins (enoxaparin, dalteparin etc), heparin derivatives (fondaparinux etc), oral anticoagulants (warfarin, rivaroxaban, apixaban etc) except under specific circumstances of switching anticoagulant therapy or when UFH is given at doses necessary to maintain an open central venous or arterial catheter. Hepatic impairment or liver disease expected to have any impact on survival. Concomitant treatment with the following strong P-gp inhibitors: systemic ketoconazole, cyclosporine, itraconazole and dronedarone. Prosthetic heart valves requiring anticoagulant treatment. **Special warnings and precautions:** PRADAXA® should be used with caution in conditions with an increased risk of bleeding or with concomitant use of medicinal products affecting haemostasis by inhibition of platelet aggregation. In clinical trials, PRADAXA® was associated with higher rates of major gastrointestinal (GI) bleeding. An increased risk was seen in the elderly (≥ 75 years) for the 150 mg twice daily dose regimen. The presence of lesions, conditions, procedures and/or pharmacological treatment (such as NSAIDs, antiplatelets, SSRIs and SNRIs), which significantly increase the risk of major bleeding requires a careful benefit–risk assessment. Close observation for signs of bleeding or anaemia is recommended throughout the treatment period, especially if risk factors are combined. Patients who develop acute renal failure must discontinue PRADAXA®. The use of fibrinolytic medicinal products for the treatment of acute ischemic stroke may be considered if the patient presents with a dTT, ECT or aPTT not exceeding the upper limit of normal (ULN) according to the local reference range. Patients on PRADAXA® who undergo surgery or invasive procedures are at increased risk for bleeding and may therefore require temporary discontinuation of PRADAXA®. PRADAXA® treatment should be resumed / started after the invasive procedure or surgical intervention as soon as possible provided the clinical situation allows and adequate haemostasis has been established. No treatment experience is available for patients with elevated liver enzymes > 2 ULN, and therefore the use of PRADAXA® is not recommended in this population. Direct acting oral anticoagulants (DOACs) including PRADAXA® are not recommended for patients with a history of thrombosis who are diagnosed with antiphospholipid syndrome, in particular for patients that are triple positive (for lupus anticoagulant, anticardiolipin antibodies, and anti–beta 2–glycoprotein I antibodies) Myocardial infarction. **Interactions:** Dabigatran etexilate is a substrate for the efflux transporter P–gp. Concomitant administration of P–gp inhibitors is expected to result in increased dabigatran plasma concentrations. There is no or only limited experience with the following treatments which may increase the risk of bleeding when used concomitantly with PRADAXA®: anticoagulants such as unfractionated heparin (UFH), low molecular weight heparins (LMWH), and heparin derivatives (fondaparinux, desirudin), thrombolytic medicinal products, and vitamin K antagonists, rivaroxaban or other oral anticoagulants, and antiplatelet aggregation medicinal products such as GPIIb/IIIa receptor antagonists, ticlopidine, prasugrel, ticagrelor, dextran, and sulfinpyrazone. **Adverse reactions:** Common: Anaemia, Epistaxis, Gastrointestinal haemorrhage, Abdominal pain, Diarrhoea, Dyspepsia, Nausea, Skin haemorrhage, Genitourological haemorrhage including haematuria. Uncommon: Haemoglobin decreased, Thrombocytopenia, Drug hypersensitivity, Rash, Pruritus, Intracranial haemorrhage, Haematoma, Haemorrhage, Haemoptysis, Rectal haemorrhage, Haemorrhoidal haemorrhage, Gastrointestinal ulcer including oesophageal ulcer, Gastroesophagitis, Gastroesophageal reflux disease, Vomiting, Dysphagia, Hepatic function abnormal/ Liver function Test abnormal, Alanine aminotransferase increased, Aspartate aminotransferase increased. Rare: Haematocrit decreased, Anaphylactic reaction, Angioedema, Urticaria, Hepatic enzyme increased, Hyperbilirubinaemia, Haemarthrosis, Injection site haemorrhage, Catheter site haemorrhage, Traumatic haemorrhage, Incision site haemorrhage. **Storage conditions:** Store in the original package in order to protect from moisture. Store below 30oC. Do not remove capsules from blister pack until just before use. **Note:** Before prescribing, please consult full prescribing information.

Abbreviated Prescribing Information PRAXBIND® (aPI PRAX 03 V1)
Presentation: Idarucizumab (solution for injection/infusion: vial of 2.5g/50mL). Indications: Praxbind is a specific reversal agent for dabigatran and is indicated in adult patients treated with Pradaxa (dabigatran etexilate) when rapid reversal of its anticoagulant effects is required: For emergency surgery/urgent procedures; In life threatening or uncontrolled bleeding. **Dosage and administration:** Restricted to hospital use only. The recommended dose of Praxbind is 5 g (2x2.5 g/50 mL), administered intravenously as two consecutive infusions over 5 to 10 minutes each or as a bolus injection. No dose adjustment is required in renally impaired patients, patients with hepatic injury, and in elderly patients aged 65 years and above. **Contraindication:** None. **Special warnings and precautions:** Idarucizumab binds specifically to dabigatran and reverses its anticoagulant effect. It will not reverse the effects of other anticoagulants. Praxbind treatment can be used in conjunction with standard supportive measures, which should be as medically appropriate. If an anaphylactic reaction or other serious allergic reaction occurs, administration of Praxbind should be discontinued immediately and appropriate therapy initiated. The recommended dose of Praxbind contains 4 g sorbitol as an excipient. Therefore, in patients with hereditary fructose intolerance the risk of treatment with Praxbind must be weighed against the potential benefit of such an emergency treatment. Patients being treated with dabigatran have underlying disease states that predispose them to thromboembolic events. Reversing dabigatran therapy exposes patients to the thrombotic risk of their underlying disease. To reduce this risk, resumption of anticoagulant therapy should be considered as soon as medically appropriate. Praxbind causes transient proteinuria, which is not indicative of renal damage. This medicinal product contains 50 mg sodium per dose, equivalent to 2.5% of the WHO recommended maximum daily intake of 2 g sodium for an adult. **Interactions:** No formal interaction studies with Praxbind and other medicinal products have been performed. Based on the pharmacokinetic properties and the high specificity in binding to dabigatran, clinically relevant interactions with other medicinal products are considered unlikely. **Adverse reactions:** No adverse reactions have been identified. **Storage conditions:** Store in a refrigerator (2oC - 8oC). Do not freeze. **Note:** Before prescribing, please consult full prescribing information.

PC-HK-100418 (Oct 2020)

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ABSTRACTS

SYMPOSIUM 1: CARDIAC REHABILITATION IN HEART FAILURE SYMPOSIUM

1.

Model of Pulmonary Rehabilitation for Chronic Heart Failure

MY Saari
Hospital Serdang, Malaysia

Chronic heart failure (CHF) and chronic obstructive pulmonary disease (COPD) patients commonly suffer from exertional symptoms of breathlessness and fatigue. The similar systemic manifestations of the conditions, including skeletal muscle dysfunction, are a major contributing factor to the limitation in exercise capacity. A period of exercise training has been shown to improve exercise performance and health-related quality of life for both conditions. Exercise training is a key component of pulmonary rehabilitation (PR) which is now a standard of care for patients with COPD and is symptom based. Although it may be assumed that patients with CHF could be incorporated into cardiac rehabilitation, this is predominantly a secondary prevention programme for patients who are largely asymptomatic. It has been shown that patients with CHF can be successfully trained together with patients with COPD by the same therapists within PR. There are comparable outcome measures that can be used for both COPD and CHF. Many patients with CHF still do not have access to an exercise rehabilitation programme and incorporating them into the PR model of care could be one solution.

2.

Cardiac Rehabilitation in Heart Failure

S Makita
The Japanese Association of Cardiac Rehabilitation, Japan

In Japan the number of our population is about 120 million and the total number of heart failure (HF) patients counts about 1,200,000. Especially elderly HF patients are increasing. Our population has been decreasing by about 250,000 annually in the past several years. The ratio of elderly people aged 65 or older to Japan's total population has reached 28.4% which is the highest one in the world. From JCARE-CARD study (Circ J 2006) revealed that more HF patients had comorbidities such as hypertension, diabetes mellitus, chronic kidney disease, anemia and atrial fibrillation and that 1-year mortality was7.3% and readmission rate within 1-year was 35%. The most commonly identified cause for hospital readmission was lack of compliance with medical and dietary treatment.

It has also been pointed out that sarcopenia and frailty predict the long-term prognosis of elderly patients with HF. As a result of meta-analysis on HF, Denfeld (Int J Cardiol 2017) reported the prevalence rate of frailty was 43% at a high rate.

Accordingly, out-patient and home-based interventions are essential for elderly patients with HF and noncardiac comorbidities with a high risk of rehospitalization to improve QOL and exercise capacity and prevent rehospitalization and conditions requiring nursing care. Many studies have reported the efficacy of multidisciplinary intervention/disease management programs in patients with HF, and a systemic review has concluded that multidisciplinary interventions significantly reduce rehospitalization rates and all-cause mortality in patients with HF.

Japanese Circulation Society published Guideline on Diagnosis and Treatment of Acute and Chronic Heart Failure in 2019. In the session of exercise therapy of this guideline, the item "For patients with HFrEF, conduct exercise therapy as ambulatory cardiac rehabilitation (CR) sessions to improve symptoms and exercise capacity" is I in class of recommendation and A in level of evidence.

Kamiya (Circ Heart Fail 2020) reported that outpatient CR participation was associated with substantial prognostic benefit in a large HF cohort regardless of age, sex, comorbidities, frailty, and HF with preserved ejection fraction. But according to the first nationwide survey (Circ J 2019) demonstrated that the implementation rates of multidisciplinary care and CR for HF, especially for outpatients, are low in Japan. The spread and continuation of CR is an important issue in Japan.

ABSTRACTS

SYMPOSIUM 2: HONG KONG HEART FOUNDATION SYMPOSIUM

3.

How Do We Assess, Personalize, Reclassify and Communicate Atherosclerotic Cardiovascular Risk?

S Virani
Baylor College of Medicine, USA

In this presentation, we will assess the 3 major steps to stratify atherosclerotic cardiovascular disease (ASCVD) risk in a patient. We will start out with what risk assessment tools are available to assess this risk. We will then assess what other patients factors (not captured in the risk assessment tools) should clinicians keep in mind when assessing a patient's ASCVD risk. Lastly, we will discuss how we can use imaging to further risk stratify patients in terms of both up classification and down classification of ASCVD risk. We will finally discuss how to use all these 3 concepts together to assess, personalize and reclassify ASCVD risk.

LUNCHTIME SYMPOSIUM

4.

Renal Outcome of NOAC: An Asian Perspective

APW Lee
The Chinese University of Hong Kong, Hong Kong

Non-Vitamin K antagonist oral anticoagulants (NOACs) are now considered to be the standard of care for stroke prevention in AF patients by international guidelines. While all NOACs are approved in AF patients with a GFR of 30 ml/min or above, there are differences in the proportion of drug excretion through kidney. However, little evidence of clinical impact has been reviewed in this aspect. Recently post hoc analysis from NOAC trials demonstrated less renal function decline with certain NOACs comparing with warfarin. Furthermore, another practice-based data from the United States also demonstrated similar renal protective effect of NOACs. In this presentation, Prof. Alex Lee will discuss his recent analysis on renal function outcome in NOAC treated AF patients in Prince of Wales Hospital and provide insights from local setting.

ABSTRACTS

SYMPOSIUM 3: HEART FAILURE SYMPOSIUM

5.

Managing Hyponatremia in Advanced Heart Failure

CC Szeto

The Chinese University of Hong Kong, Hong Kong

Hyponatremia is present in over 20% of patients admitted to hospital with heart failure, and is associated with poor short- and long-term outcomes. There are two major pathogenic mechanisms of hyponatremia in heart failure: volume overload with excessive secretion of arginine vasopressin (AVP), which is a result of reduction in cardiac output and activation of intravascular volume sensor, and hypovolemic hyponatremia due to excessive use of diuretic agents. These two conditions require entirely opposite therapeutic approaches. Fluid restriction and loop diuretics are the mainstay treatments for hypervolemic hyponatremia in patients with heart failure. More recently, AVP antagonists have been proposed as a potentially promising treatment option. Other less established options include isolated extracorporeal ultrafiltration and combination therapy of hypertonic saline and loop diuretics. On the other hand, hypovolemic hyponatremia requires reduction in diuretic dosage and occasionally normal saline infusion. In this lecture, I shall summarize the current literature on the pathogenesis and management of hyponatremia in patients with heart failure.

6.

Emerging Data in Heart Failure: Are We Doing Enough for Our Patients?

M Cowie

Imperial College London, United Kingdom

There are now many options for patients with heart failure with reduced ejection fraction (HFrEF). New trials - such as DAPA-HF and EMPEROR-reduced - suggest that SGLT2 inhibition may soon be another pillar to HFrEF therapy. But how good are we at applying the knowledge we already have? This lecture will focus on how we can ensure that patients are managed according to best practice.   Many patients are losing out in terms of length of life, hospitalisation risk, and quality of life due to under-treatment. A global survey, QUALIFY, confirms that doctor compliance with guidelines is an important prognostic factor that is often overlooked.

Heart rate is a good marker of prognosis (including hospitalisation risk) in HFrEF. We have known for 20 years that beta-blockade (BB) may improve prognosis - largely mediated by better heart rate control at rest and on exertion. Even when a BB is used at optimally tolerated doses, many patients still have a high resting heart rate, indicating a poorer prognosis. Corolan, an If channel blocker, is a well-tolerated drug that slows sinus rhythm and its use can improve patient quality-of-life, and reduce the risk of cardiovascular mortality and HF hospitalisation risk. Despite us knowing this for over a decade, many, if not most, patients are left with a higher-than-ideal resting heart rate.

When we see a patient with HFrEF, we must not forget the basics: in addition to lifestyle measures polypharmacy will be required - the better the doctor is at following the guidelines the better the patient's outcome will be. The OPTIMIZE-HF programme uses simple tools to drive up the quality of care - using protocols, discharge check lists, and patient information (written and electronic) to help improve outcomes without additional expenditure.

ABSTRACTS

SYMPOSIUM 4: HYPERTENSION AND AF SYMPOSIUM

7.

AF Management with Anticoagulation in the Era of COVID-19 Pandemic
SR Lee
Seoul National University Hospital, Korea

Non-Vitamin K Antagonist Oral Anticoagulant (NOAC) has emerged as the preferred anticoagulant option for stroke prevention in atrial fibrillation (SPAF) in the last decade. Asians, in particular, benefit greater from NOAC than vitamin-K oral anticoagulant (VKA) in terms of both efficacy and safety. Data also supports the use of NOAC in patients undergoing cardiac procedures, such as percutaneous intervention (PCI) and catheter ablation. On the other hand, this year has brought on more challenges than ever. Entering the era of COVID-19 pandemic, we will discuss how our clinical practice has changed and evolved.

CARDIAC REHABILITATION & COVID-19 "VIRTUAL REALITY" SESSION: WORKSHOP FOR ALLIED HEALTHCARE PROVIDERS

8.

Evidence-based Review on Intermittent Fasting Diet
AKW Chan
Hospital Authority, Hong Kong

Nutrition management is essential in reducing risks of cardiovascular events. Long term studies show the effectiveness in improving biomarkers of at-risk populations. Among the popular dietary approaches, the Mediterranean diet, plant-based diet and the DASH diet are best known and well researched diets with proven effectiveness.
Intermittent fasting is another dietary approach that has gained popularity in recent years. Many consider it an unconventional yet practical approach, as there are different alterations and variations in which one can apply. In this session, I will introduce this dietary approach and review the available clinical outcomes of short-term studies. While outcomes appear promising in some short-term studies, adherence can be challenging and long-term clinical outcomes are still under way. To prevent adverse events, individuals' current health and situation should be considered before implementing intermittent fasting diet.

ABSTRACTS

CARDIAC REHABILITATION & COVID-19 "VIRTUAL REALITY" SESSION:
WORKSHOP FOR ALLIED HEALTHCARE PROVIDERS

9.

Health Break - Have You Laughed Yet Today?
A Lo

Hong Kong Laughter Yoga Academy, Hong Kong

What is Laughter Yoga & How can it help you?
Everyone wants health and happiness in their lives. But instead they are getting stressed out , depressed, getting less sleep, more negative thoughts and feeling isolated. Does this sound like you? Are you someone who wants to move on and bring more laughter and joy into your life? You are in the right place. Laughter Yoga is the answer.

Laughter Yoga is a revolutionary idea - simple and profound. An exercise routine, it is sweeping the world and is a complete well-being workout. Developed by a medical doctor from India Dr. Madan Kataria and it has spread across 100 countries.

- You can laugh with special guided techniques: It's easy. Anyone can laugh for no reason without relying on humor, jokes or comedy and one can feel the benefits on the very first session!
- Real and Contagious Laughter: We initiate laughter as a body exercise in a group and with eye contact and childlike playfulness. It soon turns into real and contagious laughter.
- Oxygenates Your Body and Brain: Laughter Yoga is combination of deep breathing exercises from yoga and laughter exercises, which oxygenates our body and brain, makes us feel more healthy and energetic.

5 Benefits of Laughter Yoga

- Good Mood and More Laughter: Laughter Yoga helps to change your mood within minutes by releasing certain chemicals from your brain cells called endorphins. You will remain cheerful and in a good mood throughout the day and will laugh more than you normally do.

- Healthy Exercise to Beat Stress: Laughter Yoga is like an aerobic exercise (cardio workout) which brings more oxygen to the body and brain thereby making one feel more energetic and relaxed.
- Health Benefits: Laughter Yoga reduces the stress and strengthens the immune system.You will not fall sick easily and if you have some chronic health conditions, you will heal faster.
- Quality of Life: Laughter is a positive energy which helps people to connect with other people quickly and improves relationships. If you laugh more, you will attract many friends.
- Positive Attitude in Challenging Times: Everyone can laugh when life is good, but how does one laugh when faced with challenges? Laughter helps to create a positive mental state to deal with negative situations and negative people. It gives hope and optimism to cope with difficult times.

Source: https://laughteryoga.org/laughter-yoga/about-laughter-yoga/

10.

How Technologies Break the Communication Gap?(II)
D Fung

TytoCare, Hong Kong

TytoCare is transforming primary care by putting health in the hands of consumers. We seamlessly connect people to clinicians to provide the best home examination and diagnosis solutions. All solutions are designed to replicate a face-to-face clinician visit and include a hand-held modular examination tool for examining the heart, lungs, skin, throat, ears and body temperature, and a complete telehealth platform for sharing exam data, conducting live video exams and scheduling visit. TytoCare enables health systems to extend the reach of their clinicians, and it saves costs to patients and most importantly to the healthcare systems.

11.

How Technologies Break the Communication Gap?(II)
SLi

CarryAI, Hong Kong

AI technology has been consistently improving, combined with computer vision, it can help reduce human resource, especially in the COVID-19 pandemic.

Human Pose Estimation technology is one of the highly anticipated usages of Computer Vision. While previously it required powerful cloud computing resource, nowadays we can perform the AI detection with a standalone and portable device.

With Human Pose Estimation, we can implement fall detection algorithms to help monitor patients and provide assistants when needed. Body gesture calculations, this enables therapists to perform real time monitoring of patients of their rehab progress

AI Robotic Chair allows disabled patients to stay home independently while assisting them to use move around in their home and even use toilet.

State of the art vital sensing technology using mmWave technology perform heart rate and breath rate monitoring in an unobtrusive way while this is a major improvement over solutions requiring users to wear tracking devices.

ABSTRACTS

SYMPOSIUM 5: CARDIAC REHABILITATION & COVID-19 SYMPOSIUM

12.

ICCPR's Global Cardiac Rehabilitation Program Survey on COVID Impacts
S Grace
York University, Canada

In this presentation, I will describe the impacts of COVID-19 on CR delivery around the globe, including effects on providers and patients, and policies regarding safe service resumption. Through a cross-sectional study, a piloted survey was administered to CR programs globally via REDCap from April-June/2020. The 50 members of the ICCPR and personal contacts facilitated program identification. Overall, 1062 (18.3% program response rate) responses were received from 70/111 (63.1% country response rate) countries in the world with existent CR programs. Of these, 367 (49.1%) programs reported they had stopped CR delivery, and 203 (27.1%) stopped temporarily (mean=8.3±2.8weeks); Alternative models were delivered in 322 (39.7%) programs, primarily through low-tech modes (n=226,19.3%). 353 (30.2%) respondents were re-deployed, and 276 (37.3%) felt the need to work due to fear of losing their job, despite the perceived risk of contracting COVID-19 (mean=30.0%±27.4/100). 266 (22.5%) reported anxiety, 241 (20.4%) were concerned about exposing their family, 113 (9.7%) reported increased workload to transition to remote delivery, and 105 (9.0%) were juggling caregiving responsibilities during business hours. Patients were often contacting staff regarding grocery shopping for heart-healthy foods (n=333, 28.4%), how to use technology to interact with the program (n=329,27.9%), having to stop their exercise because they have no place to exercise (n=303, 25.7%), and their risk of death from COVID-19 due to pre-existing cardiovascular disease (n=249, 21.2%). Respondents perceived staff (n=488, 41.3%) and patient (n=453, 38.6%) personal protective equipment, as well as COVID-19 screening (n=414, 35.2%) and testing (n=411, 35.0%) as paramount to in-person service resumption. In conclusion, approximately 4400 programs ceased service delivery. Those that remain open are implementing new technologies to ensure their patients receive CR safely, despite the challenges.

13.

Cardiac Rehabilitation in Japan during COVID-19 Epidemic
S Makita
The Japanese Association of Cardiac Rehabilitation, Japan

Coronavirus Disease 2019 (COVID-19) has become the global threat which rapidly increases the number of infected patients in Japan, particularly in the main urban areas. There are still no signs of termination yet.
On 7th April 2020, the Japanese government first declared a national state of emergency over the novel coronavirus outbreak for the seven prefectures including main urban areas and announced that the risk of the occurrence of clusters was particularly high when the 3Cs overlap each other. It is quite difficult to avoid close-contact settings, including "Closed spaces with poor ventilation", "Crowded places with many people nearby" and "Close-contact setting such as close-range conversations", in cardiac rehabilitation (CR). Therefore, it is indispensable to enforce sufficient measures to prevent the infection among health care providers and patients receiving CR and the spread of nosocomial infection and to continuously provide appropriate and safe CR and cardiopulmonary exercise testing (CPX).
We have no data from detailed researches concerning the status of CR in Japan under the COVID-19 outbreak; thus, it is urgently required to investigate the current CR situation. A questionnaire survey was conducted in the CR training facilities to figure out what measures were taken against COVID-19 outbreak after the government's declaration of a state of emergency.
We conducted an online questionnaire survey to the 40 Japanese CR training facilities on April 13, 2020. The obtained data were compiled by the Public Relations Committee of the Japanese Association of Cardiac Rehabilitation.

The questionnaire survey included basic information of facilities, exercise therapy implementation, exercise testing, cardiac telerehabilitation, patient guidance, and other aspects affecting CR implementation and education. From the results of questionnaire, we assessed the differences in facilities and regions.
In parallel with the questionnaire survey, the Japanese Society of Cardiology organized a special team to tackle COVID-19-related matters, to disseminate promptly information and to suggest collaborations with the other departments and hospitals.

ABSTRACTS

SYMPOSIUM 5: CARDIAC REHABILITATION & COVID-19 SYMPOSIUM

14.

Cardiac Considerations for Return to Sports Amidst COVID-19
TJ Yeo
National University Heart Centre, Singapore

Although the end of the COVID-19 pandemic is still not in sight, it is stablising as life gradually returns to a new form of normal. This is especially important for physical activity, whether in competitive athletes, healthy individuals engaging in recreational sport or those with pre-existing heart conditions looking to improve their fitness. Avoiding sedentary behaviour, along with regular physical activity, are essential in reducing cardiovascular risk. However, with more evidence reporting multiple adverse short and long term cardiovascular sequelae in COVID-19 patients, how can we keep ourselves safe while continuing to enjoy physical activity? This lecture will cover contemporary guidelines and recommendations for physical activity and sports amidst the COVID-19 pandemic, especially in those who have contracted the disease, as well as those with pre-existing heart conditions.

15.

Cardiovascular, Pulmonary and Neuromuscular Involvement in COVID-19 and Its Management
F Torkan
Shefa Research Center, Iran

Regarding the most critical health threat in 21st century, caused by the coronavirus, identifying its controlling methods and treatments is the first priority of the medical society. Up-to-date methods are required for identifying and controlling coronavirus, due to its raising pervalence and mutations.

In this presentation, we discuss cardiac, pulmonary, and musculoskeletal side effects of coronavirus.

While COVID-19 may affect multiple organ systems, symptoms are most often located in the respiratory tract. Approximately 80% of symptomatic patients present with mild disease: symptoms of fever, runny nose, sore throat or dry cough. Moderate to severe disease is characterized by pneumonia.

Underlying CVD and/or development of acute cardiac injury are associated with significantly worse outcome in these patient, Information about other cardiovascular manifestations is very limited at patients with coronavirus disease 2019 (COVID-19) have underlying cardiovascular (CV) disease or develop acute cardiac injury during the course of the illness. Adequate understanding of the interplay between COVID-19 and CV disease is required for optimum management of these patients.

COVID-19 is primarily a respiratory illness but cardiovascular involvement can occur through several mechanism

Acute cardiac injury is the most reported cardiovascular abnormality in COVID-19, with average incidence 8-12%.

Recently research about musculoskeletal disorders in COVID-19 represent, COVID-19 that has an affinity for neural tissue. There are reports of encephalitis, encephalopathy, cranial neuropathy, Guillain-Barrè syndrome, and myositis/rhabdomyolysis in patients with COVID-19.

Moreover, Rehabilitation methods, especially exercise therapy, are discussed as supporting treatments for COVID-19. Considering cardiac side effects, like Myocarditis, and other pulmonary side effects, especially pneumonia, as well as identifying musculoskeletal side effects of COVID-19, including Neuropathy, have great importance. Furthermore, secondary side effects, caused by this disease due to deconditioning; results in a decrease in cardiac, respirational, and mobility performance of the patients after an acute period; however, by using an exact, scientific rehabilitation program, the recovery process can become shorter, and the patients can return to their normal lives cycles in a quicker way.

ABSTRACTS

SYMPOSIUM 6: LIPID SYMPOSIUM

16.

Is Atherosclerosis an Inflammatory or a Cholesterol Disorder?

S Virani
Baylor College of Medicine, USA

In this presentation, we will first start out with how cholesterol lowering reduces atherosclerotic cardiovascular disease (ASCVD risk). We will then discuss historical perspective of how inflammation is associated with ASCVD risk. We will discuss how cholesterol and inflammation are related and how cholesterol lowering can also lower the ASCVD risk attributed to inflammation. We will then discuss whether selectively targeting inflammation without lowering cholesterol is also associated with a reduction in ASCVD risk based on novel therapies and therapies like colchicine.

17.

Current Lipid-lowering Therapy Landscape Review and the APSC Consensus Statement

JWC Tan
National Heart Centre, Singapore

Volumes of research in the past half-century has established the role of dyslipidaemia in the pathogenesis of atherosclerotic cardiovascular diseases. This has also paved the way for the development of lipid-lowering therapies (LLT), including the widely used statins, which have become the cornerstone of practice guidelines worldwide. Other LLTs, such as ezetimibe and bile acid sequestrants, are also recommended, either in combination with statins or as monotherapy, in various international guidelines. Importantly, recent advances, including protein convertase subtilisin/kexin type 9 (PCSK9) inhibitors, have been shown to dramatically lower various lipid fractions. Hence, these treatments are now finding their way into international guidelines for the treatment of very-high-risk individuals.

With over 60% of the world's population residing in the Asia-Pacific region, the burden of cardiovascular disease in this part of the world cannot be ignored. However, patients from Asia-Pacific are often under-represented in clinical trials. The region is also characterized by diversity in terms of healthcare systems, access to treatment, cultural influences, and even genetic factors that may influence pharmacotherapy. With all these factors to consider, it can be a challenge for the clinician to formulate rational therapies that account for these important considerations. Hence, in 2019, the Asia Pacific Society of Cardiology (APSC) has worked on developing a series of consensus statements to aid clinicians in the region in rational decision-making. These statements cover a wide range of cardiovascular topics, from the diagnosis of acute coronary syndrome in the emergency room, to the appropriate use of pharmacotherapy and catheter-based interventions in the management of coronary heart disease, atrial fibrillation and valvular heart disease. The APSC consensus statements also focused on the management of important risk factors, such as diabetes mellitus and dyslipidaemia.

In the consensus statements for dyslipidaemia, the APSC panel defined the criteria for high-risk and very-high-risk individuals. The statements then provided recommendations for treatment for each risk group. Importantly, the APSC panel discussed the role of novel LLTs, after considering the issues and challenges patients in the Asia-Pacific region face. Lastly, as new trends in diagnosis, genetic testing and pharmacotherapy emerge, the APSC panel also considered statements on the management of familial hypercholesterolaemia and lipoprotein (a).

ABSTRACTS

SYMPOSIUM 8: CARDIOVASCULAR RISK FACTORS SYMPOSIUM

18.

Current Understanding on Mental Stress-induced Myocardial Ischaemia

L Guo

Guangdong Cardiovascular Institute, Provincial People's Hospital, China

Mental stress-induced myocardial ischemia (MSIMI) is a transient myocardial ischemic response to mental stress that can be induced in patients with coronary artery disease (CAD) during a standardized mental stress challenge, which is different from exercise-induced myocardial ischemia (ESIMI). While MSIMI was initially identified 50 years ago during activities of daily living through the use of wearable Holter monitor, subsequent research utilized the technologies of cardiac imaging-ventriculography and myocardial perfusion-under controlled conditions to pursue an understanding of pathophysiology and prognosis. This work revealed that MSIMI occurs in almost half of patients with stable CAD and is associated with cardiac events and early mortality. Recently¡Athe prevalence of MSIMI in patients with ischemic heart disease is as high as 70%. Notably, patients with CAD are more likely to develop MSIMI under the influence of factors, such as age, sex, and psychosocial characteristics. The mechanism of MSIMI involves systemic vascular resistance, endothelial function, microvascular dysfunction, Sex differences in platelet reactivity, peripheral vasoconstrictive responses, brain, and demand/supply mismatch. MSIMI has a twofold increased risk of a combined end point of cardiac events or total mortality. MSIMI not only affects the quality of life of patients but also leads to the deterioration of clinical prognosis and an increased risk of death, especially in young women. Nevertheless, the diagnostic criteria, pathogenesis, cardiovascular imaging, and treatment of MSIMI are still in the clinical exploration stage. Hence, considering recent studies, this paper summarizes the research status of MSIMI from the aspects of mechanism, cardiovascular imaging, diagnosis, and treatment strategies to provide a theoretical basis for the follow-up diagnostic methods and treatment guidelines for MSIMI.

19.

Management of People with Diabetes and Cardiovascular Diseases - What's New?

APS Kong

The Chinese University of Hong Kong, Hong Kong

Current guidelines from American Diabetes Association (ADA) and European Association for the Study of Diabetes (EASD) highlight the compelling need to minimize hypoglycemia in choosing glucose-lowering medication in people with diabetes, particularly in those with established cardiovascular disease (CVD).

For diabetes with established atherosclerotic cardiovascular disease (ASCVD) or those at risk, glucagon-like peptide-1 receptor agonist (GLP-1 RA) and sodium-glucose cotransporter 2 inhibitor (SGLT2 i) are recommended independent of glycated haemoglobin (HbA1c) due to the CVD benefits from results of cardiovascular outcomes trials (CVOTs).

In view of the progressive nature of type 2 diabetes (T2D), many patients with T2D may eventually require insulin therapy. Basal insulin is the most convenient initial insulin regimen and long-acting basal insulin analogs may convey a lower hypoglycemic risk compared to human insulin. The combination of basal insulin analogs and GLP-1 RA is an attractive treatment option for T2D with CVD who need insulin therapy. This presentation will review the evidence and guidelines regarding the choice of anti-diabetic regimen in T2D with CVD.

ABSTRACTS

CARDIAC REHABILITATION & COVID-19 "VIRTUAL REALITY" SESSION: WORKSHOP FOR ALLIED HEALTHCARE PROVIDERS

20.

How to Exercise Safely in an Increasingly Challenging Climate/ Pandemic Environment?

G Mak
Pro-Wellness Health Group, Hong Kong

This challenging COVID Pandemic has led to major Deconditioning Pandemic and its associate Covibesity (COVID + Obesity). The combination of infection, Depression and inactivity have adversely affected the general and cardiovascular health of the population. Being active and exercise in a safe and structured way is essential. Potential issues on effects of deconditioning / detraining, the safe way of resuming exercise and cardiovascular assessment for infected individual before return to play/exercise especially for the athletes will be discussed.

21.

Coronary Heart Disease in Women: Y Does X Make a Difference?

TT Low
National University Heart Centre, Singapore

Sypnosis: Sexual dimorphism in cardiovascular disease extends a wide spectrum. In particular to coronary artery disease, there are notable differences between women and men in terms coronary disease burden, risk factors, clinical presentation and prognosis. While there are still knowledge gaps in our understanding of the pathophysiologic basis for these sex differences, cardiac rehabilitation plays a potentially important role for effective sex-specific management strategies. This talk will provide current approaches to the evaluation and treatment of acute coronary syndrome and other coronary artery disease entities that have greater prevalence or unique considerations in women.

22.

Health Break - Heart Imagery Exercise for Relaxation

N Leung
Critical Incident Psychological Services Centre, Hong Kong

Guided imagery is a focused practice that involves each of the five senses to ignite positive healing messages throughout the mind and body. The practice is often interchanged with visualization and guided meditation. The benefits of guided imagery are vast - there is research that shows the practice can reduce heart rate, fear and anxiety, lessen the frequency of headaches and has been proven to decrease psychological distress in cancer patients.

Sound upload to Youtube as below:
https://youtu.be/EaF0SL3Xodc

23.

COVID-19 Pandemic: We Connected!

TJ Yeo
National University Heart Centre, Singapore

The COVID-19 pandemic has resulted in enforced and prolonged social and physical distancing. For cardiac patients, this has led to suspension of group exercise classes, whereas many healthcare providers were re-deployed to the frontlines of the COVID-19 battle. Strict travel restrictions within and between countries have also led to many families being separated from one another in different parts of the world, leading to significant stress, anxiety and even depression. Find out how both patients and healthcare workers have been impacted by the pandemic, how technology has played a part in delivering cardiac rehabilitation remotely, as well as available resources for stress relief.

ABSTRACTS

BEST ABSTRACT PRESENTATION

A18.

Effectiveness of Technology-Assisted Cardiac Rehabilitation: A Systematic Review and Meta-Analysis

MS Chong, SY Chair, JWH Sit
Nethersole School of Nursing, The Chinese University of Hong Kong, Hong Kong

Objectives: This review aims to examine the effectiveness of technology-assisted interventions in cardiac rehabilitation (CR), and to synthesise its delivery modes.

Methods: Six electronic databases including CINALH Complete, Cochrane Library, PubMed, MEDLINE via OvidSP, British Nursing Index and PsycINFO were searched from 2010 to 2020. Randomised control trials that met the inclusion criteria were critically appraised by two independent reviewers using Revised Cochrane risk of bias tool for randomized trials (RoB2). Meta-analysis was conducted using Review Manager 5.3 for at least two studies reporting the same outcome parameter. Narrative synthesis was performed if there was a considerable heterogeneity (I2) with a significant p-value.

Results: Nine trials with 1016 participants with coronary heart diseases in phase II cardiac rehabilitation (mean age between 54.9 ± 9.6 and 62.68 ± 11.95 years old, predominantly male (81.7%) were included. Technology-assisted CR interventions showed comparable effectiveness with traditional centre-based CR on modifiable coronary risk factors (systolic and diastolic blood pressure, and total cholesterol, all pooled results p>0.05), exercise capacity (peak VO2: SMD 0.13, 95% CI -0.10 to 0.35, p=0.28), psychological outcomes (anxiety: SMD 0.25, 95% CI -0.11 to 0.61, p=0.17 and depression: SMD 0.09, 95% CI -0.16 to 0.35, p=0.47). Narrative synthesis was conducted for adherence to CR. Inconsistent results were found among studies. The technology assisted CR interventions with web apps and wearable technology for self-monitoring were found to improve CR adherence when compared to traditional centre-based CR. Adverse events were self-reported, mostly were unrelated to technology-assisted CR interventions and the number of events was comparable between both groups.

Conclusion: The technology-assisted interventions, incorporating smartphone and web apps, wearable physiological sensing devices, real-time video conferencing and secure messaging in home-based or hybrid CR, have demonstrated comparable effectiveness on patient outcomes as comparing with the traditional centre-based CR programs. Thus, it has opened up an array of opportunities for patient-professional coaching and monitoring while bridging geographical distances and physical contacts, especially during the current COVID-19 pandemic. There was lack of theory-based guided intervention in technology-assisted CR for enhancing self-efficacy, social support and behavioural change strategies, which may shed light on future studies.

A21.

The Effect of Mobile Phone-based Interventions for Controlling Blood Pressure in Patients with Uncontrolled Hypertension Grade II

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Objectives: This study aimed to evaluate whether the effect of interventions delivered by mobile-phone to blood pressure control in patients with uncontrolled hypertension grade 2 at primary care.

Methods: This study is prospective study design, the study compared the blood pressure levels between mobile phone-based interventions and standard care inpatient with essential hypertension grade II. Mobile phone-based interventions are used group interactive WhatsApp (WA)Messenger and private messages WA-Messenger such as education information about the importance of medication intake and adherence, healthy diet (salt intake), and also antihypertensive medication schedule. Text messages were sent every 6 days (Table 1) during the 3-month. The primary outcome of the study is blood pressure control after follow up 3-month intervention. The Data were analyzed univariate and bivariate followed by the chi-square test and paired T-test.

Results: The data of 100 patients consisted of 50 patients who were randomized to receive and 50 to not receive the intervention. Subjects were dominated by females (70.8%), 32.7% had an elementary-high school educational level, and the mean age was 48.97 ± 6.55 years. After 3 months of follow-up, systolic blood pressure level in the intervention group decreased from 163.24 ± 2.09 mmHg to 138.44 ± 11.17 mmHg (P<0.001). Mobile phone-based intervention improved Blood Pressure control (RR, 1.57; 95% CI, 1.07-2.30, p=0.016) inpatient with uncontrolled hypertension grade 2 at primary care.

Conclusion: Mobile phone-based intervention can become an effective tool to blood pressure control by providing drug intake reminders, offering information, and healthy lifestyle education. This program has great potential to improve population health and should be considered for large-scale use at primary care in Indonesia.

Table 1. List of mobile phone text messages (translated into English) and the day the message was sent

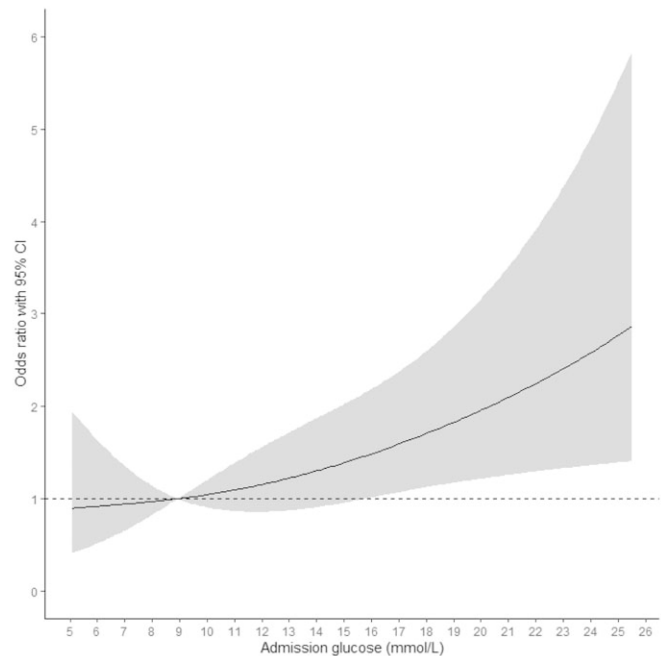|	Content of message	Day
1	Remember to take medication prescribed by your doctor according the recommended dose and schedule. Dont stop any tablet!	2
2	Blood pressure drugs work through different mechanisms. If you stop a tablet, you will lose the action and can increase blood pressure	8
3	If you have a medication prescribed at night, remember to take medication! The drug's effect lasts some hours and if you forget this dose, blood pressure can increase	14
4	Remember that salt increases blood pressure. Reduce your intake of high-sodium products such as biscuits, canned foods, and instant foods	20
5	Remember that your doctor knows your specific case and knows what you need to lower blood pressure. Take what you have been prescribed	26
6	How many blood pressure drug do you have left? If you have only a few pills for this week, plan to get your medication on time	32
7	Take the medications your doctor prescribed immediately, strictly following the schedule and doses indicated	38
8	If you feel that your blood pressure medicine causes you discomfort, tell your doctor immediately for a change. Do not decide to change it by yourself	44
9	Do not stop treatment even if your blood pressure has returned to normal, or if you feel better, except on your doctor's advice	50
10	Stress affects hypertension. Take quiet space and moments, and don't forget to take your medications at the time and dose indicated.	56
11	If you forget to take the morning medicine, do it as soon as possible. To avoid forgetfulness, leave it near your breakfast cup.	62
12	If you must take medication during working hours, program your cell phone alarm to remind you when appropriate.	68
13	Have you tried eating food with less salt? If you do not like it, at least try to get the salt shaker off the table. That's already an improvement.	74
14	If this week you have taken all your medications at the correct time and dose, congratulations!	80
15	By controlling blood pressure, you add years to your life. Remember to take your medications to control it. We want to take care of you!	86

ABSTRACTS

A29.

Association Between Acute Hyperglycemia and Fatal Arrhythmia in Previously Diabetic Patients with STEMI

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Objective: Acute hyperglycemia is common phenomenon in patients with ST elevation myocardial infarction (STEMI) and associated with unfavorable outcome. In this study, we aimed to reveal association between acute hyperglycemia and fatal arrhythmia in previously diabetic patients who experienced STEMI.

Methods: In this study, we choose patients with STEMI who treated by primary PCI. Ventricular tachycardia (VT) or fibrillation (VF) are considered as a fatal arrhythmia. Spline curve estimation used to investigate optimal cut-off of admission blood glucose level to define acute hyperglycemia. Univariable and multivariable logistic regression used to determine association between acute hyperglycemia and VT/VF.

Results: A total of 542 patients were selected (mean age 60±14, male 84%) and 171 (31%) patients were previously diabetic. During hospitalization, VT/VF occurred in 39 (7%) patients. Spline curve estimation showed that there was gradual increase of the relative risk of VT/VF with increased admission glucose level and admission glucose >9 mmol/L was associated with increased risk of VT/VF. After adjustment of systolic blood pressure, QRS duration, serum potassium level, final TIMI 3 flow of coronary circulation and left ventricular ejection fraction, multivariable logistic regression revealed that admission blood glucose level was independently associated with VT/VF (OR=1.08, 95% CI 1.00-1.16, p<0.05) in previously diabetic patients with STEMI.

Conclusion: Acute hyperglycemia is independent predictor of fatal arrhythmia in previously diabetic patients with STEMI who treated by primary PCI.

A32.

Recent Trends in Out-of-hospital Cardiac Arrest (OHCA) Outcomes in Singapore in the Era of COVID-19

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Objectives: To analyse the incidence of emergency medical service-attended out-of-hospital cardiac arrests (OHCAs) and prehospital return of spontaneous circulation (ROSC) outcomes in Singapore from January to May 2020, as compared to the same period in 2018 and 2019.

Methods: This was a retrospective observational study comparing current and previous emergency medical service (EMS) data and OHCA records maintained by the Singapore Civil Defence Force (SCDF). These figures were tabulated from data input by experienced paramedics responding to EMS calls and verified by an internal audit team. The study was conducted in accordance with the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) guidelines, and examined factors that may have contributed to an increase or decrease in OHCA incidence and prehospital ROSC attainments during the different time periods.

Results: Coronavirus Disease 2019 (COVID-19) is a global pandemic of unparalleled scale. Despite total EMS call volumes and overall OHCA incidence remaining comparable to pre-COVID periods, there was a concerning decrease in pre-hospital ROSC attainments between January to May 2020 (an average of 8.4%). Based on multivariable logistic regression, this was much lower when compared to previous years, where the pre-hospital ROSC rates remained around 12% (p<0.001). Further analyses did not reveal significant differences in terms of the median age of OHCA victims, the percentage of shockable rhythm or response times. However, it was noted that more OHCAs were occurring in residential homes, while those in public spaces decreased considerably compared to previous years (p<0.001). In addition, there was also a drop in the overall bystander cardiopulmonary resuscitation (CPR) rates compared to pre-COVID periods (p<0.001).

Conclusion: The findings remain preliminary and follow-up data in the subsequent months are necessary to further investigate these trends. Nonetheless, they provide important lessons for public education and pandemic preparedness. To strengthen the first links in the survival chain, members of the public should be educated to initiate CPR and automated external defibrillator (AED) for any non-responsive victim (even without mouth-to-mouth ventilation).

ABSTRACTS

A44.

The Benefits of Home Based Telemonitored Cardiac Rehabilitation Exercise Program Among Patients with Reduced Ejection Fraction Heart Failure: Its Significance on COVID-19 Pandemic

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Objectives: This study is a randomized clinical trial aimed to investigate the effects of a home-based cardiac rehabilitation exercise program with social media-based supervision on NT-proBNP level and functional capacity of heart failure with reduced ejection fraction patients.

Methods: We randomly recruited 25 subjects with left ventricle ejection fraction <40%, early after heart failure hospitalisation, resting heart rate <100 bpm, NYHA class I and II, and 6MWT entry test >100 m. Subjects were allocated into combination of hospital and home group (Control Group/CG) (n=12) and the home group under supervision of videocall telemonitor using WhatsApp (Intervention Group/IG) (n=13). Both groups got an exercise program 5 times / week, moderate intensity, 30 minutes per session for 4 weeks. The endpoint is a change in NT-proBNP level and 6 minute walk distance (6MWD) at week 4 as a marker of increased functional capacity.

Results: The groups have similar baseline characteristics. There was a significant decrease in NT-proBNP levels in IG and CG (2834±1546.39 pg/mL and 3340±853.18 pg/mL, p=0.001 vs 0.041). Comparative analysis of changes in NT-proBNP level between the two groups did not show a significant difference (p=0.979). Post-intervention NT-proBNP levels in the IG group were 2553±778.86 pg/mL and CG group 2448.90±701.84 pg/mL, p=0.852. The 6MWT distance increased significantly in both groups (IG and CG 29.92±30.95 m vs 69.75±75.68 m, p=0.005 vs 0.009, respectively), mean increase in CG was higher than IG, but not significant (p=0.225). Post-intervention 6MWD result of the IG was 340.92±109.38 m, and CG 378.42± 142.69 m, p=0.401.

Conclusion: Home-based telemonitored cardiac rehabilitation with social media supervision (using WhatsApp) programs has comparable effectiveness as the combined cardiac rehabilitation program. In current COVID-19 pandemic, home-based telemonitored cardiac rehabilitation program can be implemented with similar benefit as conventional program.

A54.

What Factors That Elderly Patients with Heart Failure 90 Years Old or More Should Obtain Due to Get Their Independence Gait for 50m Continuous?

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Objectives: This study aimed to clarify what factor influenced to get the ability of independent gait for heart failure (HF) patients 90 years old or more.

Methods: From February 2019 to July 2020, we consecutively enrolled all HF patients 90 years old or more who gait independence or with a cane. First, we divided them into two groups whether could gait 50m or more independence or not at the discharging hospital. The blood samples, echocardiographic parameters, physical findings, and physical performance were adopted as measurement data. We compared these data between the groups using Fisher's exact test and the Mann - Whitney U-test. Second, a logistic regression analysis was performed to extract the characteristic of patients who can walk 50m or more independently. Finally, we constructed a receiver-operating characteristic (ROC) curve to evaluate parameters that were chosen by logistic regression analysis. We also calculated cutoff points and the area under the curve (AUC) to evaluate the accuracy of it. This study was a single-center retrospective observational study.

Results: We enrolled 26 subjects (16 independent, 10 not). The independent gait group showed significantly higher short physical performance battery (SPPB) score [4 (2.8-5), non: 8 (7-8.8), independent, p<0.001], and lower C-reactive protein (CRP) level [0.55 (0.07-1.42), non : 0.05 (0.03 - 0.06), independent, p=0.005). Second, we performed logistic regression analysis, in which only SPPB score (OR=4.12, 95% CI: 1.05-16.1, p=0.042) was significantly associated with getting ability of the independent gait. Finally, The AUC of the ROC had a prediction accuracy of 0.956 (95% confidence interval: 0.89 to 1) and the cutoff of SPPB score was 7 points.

Conclusion: SPPB score is a strong predictor for enabling elderly patients with HF 90 years old or more to gait 50m continuously.

ABSTRACTS

ORAL ABSTRACT PRESENTATION

A3.

Apabetalone Reduces Alkaline Phosphatase: A Meta-analysis

HL Li, BMY Cheung

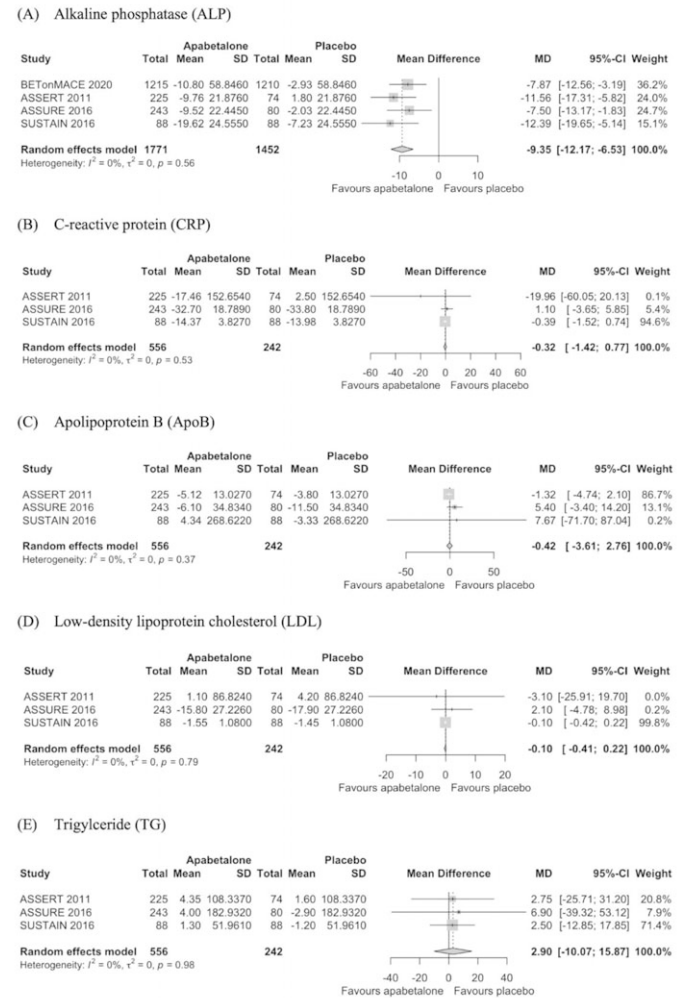Department of Medicine, LKS Faculty of Medicine, The University of Hong Kong, Hong Kong

Objectives: Apabetalone is a novel drug that exerts anti-inflammatory effects by inhibiting bromodomain and extra-terminal proteins (BET). We have previously performed a meta-analysis and demonstrated that it reduced major adverse cardiovascular events and hospitalization due to heart failure, and increased levels of apolipoprotein A-I and high-density lipoprotein cholesterol (HDL), compared to placebo. In this meta-analysis, we evaluated the effects of apabetalone on inflammatory markers and other lipid parameters.

Methods: We searched the literature for randomised controlled trials on apabetalone. Four trials (BETonMACE, ASSERT, ASSURE, SUSTAIN) were eligible for inclusion. The outcomes of interest were inflammatory markers (alkaline phosphatase (ALP) and high-sensitivity C-reactive protein (CRP)) and atherogenic lipids (Apolipoprotein B (ApoB), low-density lipoprotein cholesterol (LDL), and triglyceride (TG)). Pooled mean differences (MD) and 95% confidence intervals (95% CI) in a random-effects model were generated using the "meta" package in R (version 3.6.3).

Results: Altogether 3223 patients were included. All patients had coronary artery disease and received standard statin therapy. Apabetalone significantly reduced ALP (MD -9.35%, 95% CI: -12.17 to -6.53) (Figure 1), but the reduction in CRP was not statistically significant (MD -0.32%, 95% CI -1.42 to 0.77). No significant differences were observed for ApoB (MD -0.42%, 95% CI -3.61 to 2.76), LDL (MD -0.10%, 95% CI -0.41 to 0.22), and TG (MD 2.90%, 95% CI -10.07 to 15.87). There was no significant heterogeneity among the included trials.

Conclusion: Apabetalone reduces ALP, an inflammatory marker associated with cardiovascular risk. It increases HDL but there was no reduction in LDL or CRP, indicating that apabetalone acts differently from statins. It is a promising therapeutic strategy for hypercholesterolaemia and cardiovascular diseases, but how it reduces cardiovascular events warrants further investigation.

Figure 1.

(A) Alkaline phosphatase (ALP)

(B) C-reactive protein (CRP)

(C) Apolipoprotein B (ApoB)

(D) Low-density lipoprotein cholesterol (LDL)

(E) Triglyceride (TG)

ABSTRACTS

A12.

Home-based Cardiac Tele-rehabilitation during COVID-19 – Early Preliminary Experience for Post Cardiac Surgery Patients in Hong Kong

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Objectives: Home-based Cardiac rehabilitation (HBCR) models have been implemented as a potential solution to address access barriers to cardiac rehabilitation (CR). During COVID-19 pandemic peak period in Hong Kong, there is increasing emphasis on social distancing and caregiving strategies to better reach patients (pt) outside hospital. We designed and implemented HBCR amongst cardiac pts recovering from major cardiac surgeries including heart transplantation. We report our early 4 weeks' experience of HBCR during peak COVID-19 outbreak and explore the safety and feasibility of HBCR with telecommunication and tele-monitoring using wearable device (WD).

Methods: Twelve pts (8 men (66%); mean age 52.6±9.7) were enrolled in July 2020. There are 5 post-heart transplant pts, 6 post-cardiac surgery pts and 1 post-PCI pt. HBCR includes exercise prescription, nutrition and risk factor modification for 12 weeks. An individualized exercise prescription is determined based on initial standardized assessments in hospital and tailored to fit lifestyle and home environment. Goal is set at 150 minutes of low to moderate-intensity aerobic exercise per week. Exercise is progressed weekly based on daily metrics recorded by WD (exercise log and % target heart rate reserve (THRR) attained), exercise routine and rate of perceived exertion (RPE). These were reported by pts through an online survey after each exercise session which were reviewed daily, with progress follow-up by phone calls or text messages on a weekly basis.

Results: All pts participated and uploaded their WD data successfully despite early connectivity issue in 1 pt. 75% pts submitted online survey after each exercise session. Weekly average exercise time was 330 minutes (median). Mean % THRR was 58%. Overall mean reported BP was 118±10 mmHg and mean RPE was 11±1.7. No adverse event or emergency hospitalization reported. Weekly follow-up communications were all successful. One pt with new onset atrial fibrillation was detected with prompt in-hospital consultation.

Conclusion: HBCR protocol designed and supervised remotely by dedicated CR team is safe and effective. It is foreseeable that HBCR will continue beyond COVID-19 to serve critical needs of pts with improved utilization of CR.

A35.

The Effects of Maintenance Cardiac Rehabilitation: A Systematic Review and Meta-analysis

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Objective: Maintenance (phase III/IV) cardiac rehabilitation (CR) is recommended to promote maintenance of benefits achieved during Phase II, yet there has been no meta-analysis to date. The objective of this study was to determine the effects of maintenance CR on any outcome.

Methods: Medline, Pubmed, Embase, Lilacs, PsycINFO, CINAHL, and Emcare were searched for articles from inception to January 2020. Randomized controlled trials on the effects of maintenance CR (≥ 6 months, regardless of setting) in cardiovascular disease patients who had graduated from CR (≥ 6 weeks), with a control or comparison arm were included. Citations were processed by 2 authors independently. Methodological quality was assessed using Cochrane's Risk of Bias tool (v1), and level of evidence evaluated with GRADEPro. Outcomes were quantitatively synthesized with meta-analysis where possible.

Results: 819 citations were identified, with 10 trials (21 papers) meeting inclusion criteria (5238 participants; 859 [16.4%] female). Results showed maintenance CR resulted in lower low-density lipoprotein cholesterol (mean difference [MD]=-0.58; 95% confidence interval [CI]=-1.06-0.10; very low-quality evidence; I2=95%) and greater quality of life (MD=0.28, 95% CI=0.05-0.52; low-quality evidence; I2=0%) when compared to usual care; no significant effects were observed for adverse events, functional capacity, or other risk factors. Qualitatively, included trials revealed better muscle strength, medication adherence, social support and cognition, as well as lower depressive symptoms with maintenance CR. Outcomes for women and sex differences were mixed.

Conclusions: Maintenance programs appear to sustain patient's quality of life, but more focus on women's outcomes is needed. Consideration of accessibility to these services is warranted, given the benefits of phase II CR, and that patients often pay out-of-pocket.

ABSTRACTS

A36.

Cardiac Rehabilitation Component Attendance, and Impact of Intervening Clinical Events, as well as Disease Severity and Risk Factor Burden

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Objectives: To examine: (1) the rate of clinical events precluding cardiac rehabilitation (CR) continuation, (2) CR attendance by component in those without events, and (3) the association between disease severity (e.g., tobacco use, diabetes, and depression) and component attendance (e.g., exercise, diet, stress management, tobacco cessation).

Methods: Retrospective analysis of electronic records of the CR program in London, Ontario from 1999-2017. Patients in the supervised program are offered exercise sessions twice per week, with a minimum of 48 prescribed sessions tailored to patient need. Patients attending ≥1 session without major factors that would limit their exercise ability were included. Intervening events were recorded, as was component attendance.

Results: Of 5508 enrolled, supervised patients, 3696 did not have a condition that could preclude exercise. Of these, one-sixth (n=912) had an intervening event; these patients were less likely to work, more likely to have medical risk factors, had more severe angina and depression, and lower functional capacity. The remaining cohort attended a mean of 26.49±21.30 sessions overall (median=27; 19.36% attending ≥48 sessions), including 20.49±17.45 exercise sessions (median=21). After exercise, the most common components attended were individual dietary and psychological counselling. Patients with more severe angina and depressive symptoms as well as tobacco users attended significantly fewer total sessions, but more of some specific components.

Conclusions: In 1/6 of patients, CR attendance and completion are impacted by clinical factors beyond their control. Many patients are taking advantage of components specific to their risk factors, buttressing the value of individually-tailored, menu-based programming.

ABSTRACTS

A39.

Right Ventricular Function, Mechanical Ventilation Duration, and ICU Length of Stay in Heart Valve Surgery Patients Underwent Preoperative Inspiratory Muscle Training

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[1]Department of Cardiology and Vascular Medicine Faculty of Medicine, Diponegoro University - Dr. Kariadi General Hospital; [2]Department of Physical Medicine and Rehabilitation Faculty of Medicine Diponegoro University - Dr. Kariadi General Hospital, Semarang, Indonesia

Background and Objectives: The reduction of right ventricular function after heart valve surgery was associated with mortality and morbidity after cardiac surgery, longer mechanical ventilation duration and ICU length of stay (ICU LOS), which resulted in higher hospital cost. Inspiratory muscle training can be considered for improving right ventricular systolic function by optimalize afterload and cardiac contractility. The objective of this study was to investigate the benefit of preoperative inspiratory muscle training on right ventricular systolic function by using echocardiography right ventricular fractional area changes (RV FAC) measurement and it's impact on mechanical ventilation duration and ICU LOS in heart valve surgery patients.

Methods: Thirty patients scheduled for elective heart valve surgery on August-November 2019 were randomized into conventional preoperative rehabilitation group and conventional preoperative rehabilitation added high intensity inspiratory muscle training at least 14 days before surgery. Echocardiography examination were performed before preoperative rehabilitation program and after cardiac surgery.

Results: The patients were randomized into 15 patients in control group and 15 patients in intervention group. There were 12 patients on each group completed the preoperative and postoperative echocardiography evaluations. Both groups had no significant differences on RV FAC (44.3±4.1% vs 42.0±8.5%; p=0.562) during the preoperative examination. We found significant difference on RV FAC between intervention and control group (43.2±4.9% vs 35.1±8.8; p=0.006) on postoperative evaluations. Although mechanical ventilation in the intervention group was shorter than control group, it wasn't statistically significant (16±9 vs 21±15 hours; p=0.38). The ICU LOS in intervention group was significantly shorter than control group (3.2±0.8 and 4.2±1.3 days; p=0.044).

Conclusion: Patients underwent conventional preoperative rehabilitation added inspiratory muscle training had better right ventricular function postoperatively and shorter ICU length of stay than patients in control group. However, there was no significant difference on mechanical ventilation duration between two groups.

Table 1. Baseline characteristics

	Intervention (n=12)	Control (n=12)	p
Age (y.o)	44.9 ± 9.5	41.2 ± 11.6	0.406[a]
Sex			
Female (n)	6 (50%)	6 (50%)	1.0[b]
Type of surgery			0.589[c]
- MVR	9 (75%)	8 (67%)	
- DVR	3 (25%)	3 (25%)	
- AVR	0 (0%)	1 (8%)	
RV FAC (%)	44.3 ± 4.1	42.0 ± 8.5	0.562[a]
LVEF (%)	65.5 ± 8.5	64.7 ± 7.8	0.805[a]
PH probability (n)			0.607[c]
- No PH	3 (25%)	3 (25%)	
- Possible	7 (58%)	5 (42%)	
- Likely	2 (17%)	4 (33%)	

[a]independent t test; [b]Fischer exact test; [c]chi square

Table 2. RV FAC before and after cardiac surgery, mechanical ventilation duration, and ICU LOS

	Intervention (n=12)	Control (n=12)	p
RV FAC (%)			
- Pre	44.3 ± 4.1; 43.5 (39 − 52)	42.0 ± 8.5; 42.5 (19 − 56)	0.562[a]
- Post	43.2 ± 4.9; 42.5 (36 − 56)	35.1 ± 8.8; 37 (17 − 51)	0.006[a]
- Δ Reduction	1.1 ± 7.4; 1 (-13 − 16)	6.9 ± 5.8; 6 (0 − 18)	0.043[b]
Mechanical ventilation duration (hours)	16 ± 9	21 ± 15	0.38[b]
ICU LOS (days)	3.2 ± 0.8	4.2 ± 1.3	0.044[b]

[a]Mann Whitney test [b]Independent t-test

ABSTRACTS

A45.

The Effects of Smartphone-based Cardiac Rehabilitation Program for Percutaneous Coronary Intervention Patients in Macau

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Objectives: To assess the effects of a smartphone-based mHealth cardiac rehabilitation (mCR) intervention, compared to usual CR care, among post percutaneous coronary intervention (PCI) patients on the outcomes of: level of anxiety and depression, exercise capacity, physical activity level, risk factors modification, medication adherence, self-efficacy on cardiac exercise and diet, and health-related quality of life (HRQL).
Method: A randomized-controlled trial was conducted during December of 2017 to December of 2019 in a Macau non-governmental Hospital. In which 140 out of 110 recruited CR participants were eligible for random assignment to either experimental group (EG, mCR group) or control group (CG, CR booklet group). The EG was grounded by Social Cognitive Theory.
Results: 110 patients were randomized and 100 patients completed the study. The recruitment rate was 78.57%. A significant interventional effect on total cholesterol reduction of 0.507 mmol/L (ß=-0.507; p=0.031) and 0.464 mmol/L in low density lipoproteins (ß=-0.464; p=0.032). Sitting time reduction at the 12th week was found a significant effect in EG (ß=-0.171; p=0.023). In addition, regular exercise performance in favour of the intervention group were significantly improved at the 6th week (OR=3.564; p=0.027) and the 12th week (OR=7.141; p=0.000), 6-minute walk test at both the 6th week (ß=26.296; p=0.034) and the 12th week (ß=29.690; p=0.037). Significant reductions at the 12th week were observed in anxiety by Hospital Anxiety and Depression Scale (HADS) (ß=-0.451; p=0.020) and total HADS score (ß=-0.483; p=0.003). Moreover, significant improvements at the 12th week in self-efficacy on cardiac exercise and diet (ß=11.464; p=0.000; ß=7.590; p=0.001), and HRQL (ß=-8.378; p=0.000).
Conclusion: This mCR study was designed for Macau post PCI patients to support their self-care and adherence in phase II CR after hospital discharge. The results were encouraging and helped post-PCI patients adhere to their CR recommendations.

A55.

Exercise Training in Patients with Implanted Ventricular Assist Devices

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[1]Yunnan BOYA Hospital, Kunming, China; [2]Hospital Corentin Celton, Paris, France; [3]Free University of Belgium, Brussels, Belgium

Background: Patients implanted with ventricular assist device (VAD) still have impairment of exercise capacity. Only few recipients' patients were included in a cardiac rehabilitation (CR) program and moreover have sufficient intensity training.
Purpose: The aim of this study was to evaluate the impact of exercise training on exercise capacity in patients implanted with VAD.
Methods: This monocentric retrospective study includes 71 VAD patients (67 males, mean age: 53.6±13.2 years) referred to CR 63±54 days after implantation; 13 biventricular and 58 left VAD. Patients underwent clinical evaluation and cardiopulmonary exercise testing (CPET) before and at the end of the CR program; education and personalized exercise training including endurance and resistance training for 20 sessions. The main outcome was the changes on maximal and submaximal exercise capacity (the oxygen consumption (VO2) at peak exercise and at first ventilatory threshold levels (VT1)).

Results: Among the whole population, 70 were able to perform the baseline CPET (peak VO2 is 39±9% of normal values). The CPET after CR was available for 81.6% (13 patients not complete the entire program due to early transplantation, complications or willingness). For the 58 patients who have completed the program, results are displayed in Table 1.
Conclusions: Exercise training improves significantly the exercise capacities of VAD recipients. This contributes to enhance quality of life and probably better clinical status in awaiting transplant patients.

Table 1.

	Baseline	End of training	p
Peak workload (watts)	56.9 ± 18.2	85.7 ± 29.8	<0.001
Peak VO$_2$ (ml/kg/mn)	12.0 ± 2.8	15.4 ± 4.5	<0.001
Peak METs	3.4 ± 0.8	4.4 ± 1.2	<0.001
VT1 (ml/kg/mn)	8.7 ± 2.2	11.1 ± 3.2	<0.001
VE/VCO$_2$ slope	43.6 ± 8.9	38.6 ± 7.9	<0.001

ABSTRACTS

A58.

Degree of Emphasis on Cardiac Rehabilitation in Online Health Information

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Objectives: Lifestyle changes are critical for prevention of coronary artery diseases. Among recommended changes, cardiac rehabilitation (CR) has been identified as the most important evidence-based intervention for secondary prevention of myocardial infarction (MI); however, it has widely been reported to be fraught by poor adherence and completion rates. As most uncomplicated MI patients are discharged after only 24 to 48 hours of hospitalization, more patients are turning to the web for information. Therefore, this study aimed to assess online data on CR with regards to lifestyle change.

Methods: Two independent investigators queried the lay terms "lifestyle changes after heart attack" on Google search engine. The first 100 websites were analyzed and categorized into either informational or professional. Websites were first screened for the mention of CR; if CR was mentioned, the relative order of CR amongst other lifestyle changes was assessed as per primacy effect. Statistical analyses were performed using Chi-square and two-tailed T-test with significance of $p<0.05$.

Results: Of the 100 websites analyzed (45 informational and 55 professional), 26 websites (26%) mentioned CR as a mode of lifestyle change. There was no significant difference between informational and professional websites (22% and 29%, respectively with $p=0.44$). When the 26 websites were further analyzed on the mean order of CR mention amongst other advice, there was no significant difference between informational and professional websites (3.2 and 2.31, respectively with $p=0.17$).

Conclusion: There was no significant difference between professional and informational websites in terms of mention and the order of CR, but it is important to note that CR was under-emphasized with just 26% of first 100 websites mentioning it. Therefore, physicians should educate cardiovascular patients on the importance of CR during hospitalization and follow-up visits.

A66.

Effects of Intradialytic Exercise Training on Functional Capacity and Quality of Life among Hemodialysis Patients at a Tertiary Cardiac Center in the Philippines

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Objectives: To determine the effectiveness of a structured intradialytic exercise program in the functional capacity and quality of life among chronic kidney disease (CKD) patients on hemodialysis (HD).

Methods: An experimental research design was adopted to conduct the study in an outpatient HD unit. Thirty-three patients (mean age 53.36 + 16.11 years, 63.6% male) were allocated into experimental group (EG) and control group (CG). The EG received an 8-week structured program compared to no exercise training for the CG. Pre and Post assessment of functional capacity thru 6-minute walk test (6MWT) and sit to stand test (STS) were analysed. Quality of life was assessed using a Filipino version of the Kidney Disease Quality of Life (KDQOL) questionnaire.

Results: On completion of the program, there was a significant improvement in the mean 6MWT distance of 318.6 meters ($p=0.017$) and the mean STS time of 19 sec ($p=0.009$) in the EG compared to the CG. There was also a significant improvement in the EG's overall quality of life across all domains characterized. No adverse events were noted.

Conclusion: The results of this pilot study, the first structured intradialytic exercise program among CKD patients in the Philippines, suggest that the prescribed program is a safe and effective clinical intervention to improve functional parameters and quality of life in these patients.

ABSTRACTS

E-Poster Presentation:

A2.

Early Cardiac Rrehabilitation Clinic Appointment for Acute Coronary Syndrome Patients

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Khoo Teck Puat Hospital, Singapore

Cardiac Rehabilitation Program (CRP) has been proven to be effective and beneficial for patients after acute coronary syndrome (ACS). In our hospital, phase 1 CRP is mandatory for all ACS patients during the index admission. However, the recruitment of phase 2 CRP was poor.

Objectives: To compare the recruitment rate (RR) of phase 2 CRP and risk factor modification between cardiac rehabilitation clinic (CRC) run by cardiac rehabilitation professionals and routine cardiac clinic (RC) run by general cardiologists.

Methods: From September 2018 to February 2019, patients admitted for ACS were randomly assigned to either CRC or RC for follow up. In the CRC group, patients will be followed up 1-2 weeks after discharge and then for 1 year. During the first visit of CRC, the benefits of CRP, targets LDL level and blood pressure (BP) were advised. Whereas, in the RC group, patients will be followed up in 3-4 months post discharge as per usual practice and then for 1 year. BP and serum LDL level were monitored regularly in both clinics. Total 271 were admitted to our hospital for ACS during this 6 month period. 43 were assigned to CRC and 228 to RC. The baseline characteristics were compared and also the RR of phase 2 CRP. BP reading and serum LDL levels after 1 year of FU were also compared.

Results: Among the 271 patients, 33 patients were lost for follow up (4 and 29 in CRC & RC respectively). The baseline characteristics were similar in both group, except the age, whereas patients were younger in the CRC group (52+/-10 vs. 60 +/- 11 years, p<0.01). The RR of phase 2 CRP was significantly higher in the CRC group (43.6% vs. 15.6%, p<0.01). After 1 year of follow up, serum LDL level was significantly lower in CRC patients (1.70+/-0.55 vs. 2.07+/-0.79 mmol/l, p<0.01) but there was no significant difference in BP control.

Conclusions: Early CRC run by cardiac rehabilitation professionals within 1-2 weeks after discharge for ACS can significantly improve the phase 2 cardiac rehabilitation program recruitment rate and LDL control.

A4.

Cardiopulmonary Rehabilitation in Coronary Arterial Disease, Chronic Heart Failure Caused by Valvular Heart Disease in Mitral and Tricuspid Valve with Chronic Obstructive Pulmonary Disease: A Case Report

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Objectives: To determine the effect of cardiopulmonary rehabilitation program on the functional capacity, and quality of life in elder patient with coronary arterial disease (CAD), chronic heart failure (CHF) caused by valvular heart disease (VHD) in mitral-tricuspid valve with chronic obstructive pulmonary disease (COPD). COPD causes heart failure thus can increase the risk of death in patients. Besides medical treatment, we provide an appropriate rehabilitation program to increase functional capacity and quality of life (QoL).

Methods: A case report of a male patient age 63 years old, diagnosed with CAD, CHF caused by VHD in mitral-tricuspid valve who underwent coronary artery bypass graft (CABG) and mitral-tricuspid valve repair procedure four years ago. Patient had COPD in pass 6 years. Patient's chief complaint was shortness of breath and fatigue in performing moderate activities. The results of spirometry were FEV1 25%, FVC 47%, FEV1 / FVC 52%. Patient had low inspiratory and expiratory capacities with ineffective coughing ability. The six minutes walking test indicated a functional capacity of 4.65 metabolic equivalents (METs). QoL was assessed with the St George's Respiratory Questionnaire (SGRQ). Comprehensive cardiopulmonary rehabilitation consists of counseling education and exercise. Patient was given breathing retraining, active cycle breathing technique and inspiratory muscle training with load intensity 30-60% maximal inspiratory pressure (MIP) 2 times a day. Aerobic exercise using treadmill 3 times a week with 60% heart rate reserve (HRR) for 20 minutes, progressing to 80% HRR in 30 minutes in 8 weeks. After 8 weeks, there was an increase in the inspiratory and expiratory capacity, cough ability, functional capacity and decrease total SGRQ score.

Results: There was increase functional capacity from 4.9 METs in 4 weeks into 5.5 METs in 8 weeks; For SGRQ after 8 weeks showed improvement QoL by decreasing the total score from 62.27 to 36.96. There is improvement of cough ability, increasing MIP from 55 into 73 and MEP from 51.7 into 68 in 8 weeks.

Conclusion: A supervised comprehensive cardiopulmonary exercise program in 8 weeks is proven to increase functional capacity and improvement QoL in elder patient with CHF and COPD.

ABSTRACTS

E-Poster Presentation:

A5.

SGLT2 Inhibitors Reduce the Risk of Arrhythmias: A Meta-analysis

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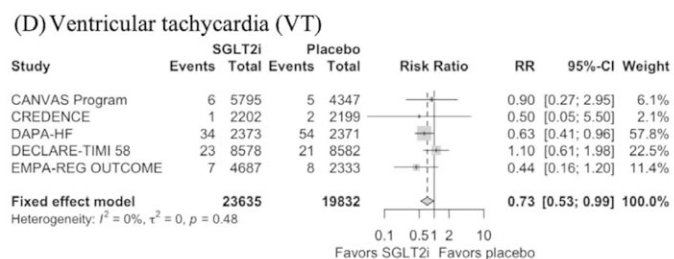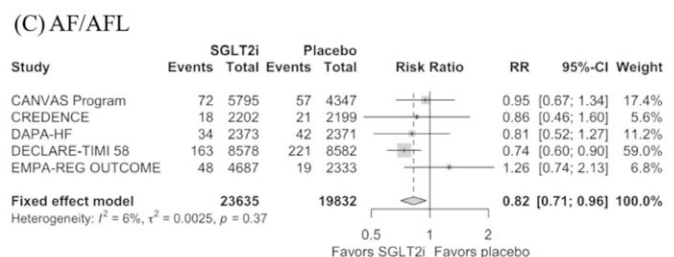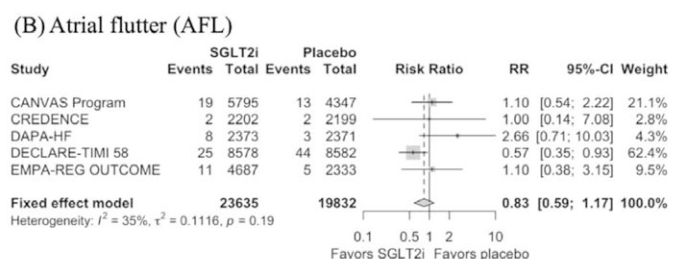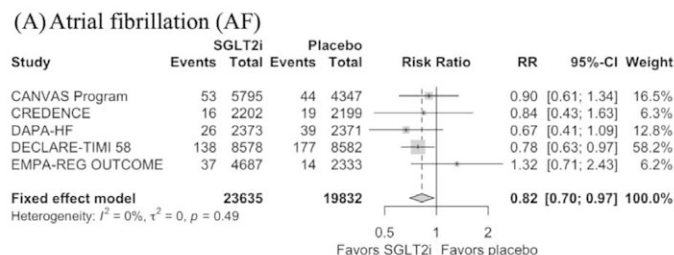
Objectives: Atrial fibrillation (AF) and cardiac arrhythmias are closely associated with diabetes mellitus (DM), heart failure (HF), and chronic kidney disease (CKD). A recent secondary analysis of the DECLARE-TIMI 58 trial showed that sodium-glucose cotransporter 2 inhibitors (SGLT2i) reduced the incidences of AF/atrial flutter (AFL). However, a previous meta-analysis did not show a significant association between SGLT2i treatment and AF. This systematic review and meta-analysis aim to reconcile these inconsistencies by investigating the association between SGLT2i treatment and cardiac arrhythmias.

Methods: MEDLINE, EMBASE, and ClinicalTrials.gov were searched up to 20 August 2020. Placebo-controlled trials of SGLT2i that randomized ≥1000 patients with DM, HF, or CKD that reported outcomes of interest as serious adverse events were included. The primary outcome was AF, and the secondary outcomes were AFL, a composite outcome of AF and AFL (AF/AFL), ventricular tachycardia (VT), and cardiac arrest. Pooled relative risks (RRs) and 95% confidence intervals (CI) were generated using fixed-effects model in R (v3.6.3).
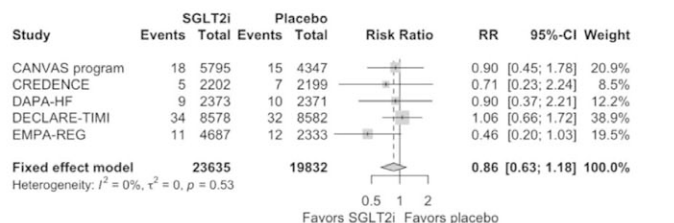
Results: Out of 3311 citations, five trials with altogether 43467 patients were included. SGLT2i were associated with a lower risk of AF (RR 0.82, 95% CI 0.70-0.97), AF/AFL (RR 0.82, 95% CI 0.71-0.96), and VT (RR 0.73, 95% CI 0.53-0.99), while the risk reduction in AFL (RR 0.83, 95% CI 0.59-1.17) and cardiac arrest (RR 0.86, 95% CI 0.63-1.18) did not reach statistical significance. The associations appeared to be consistent across baseline conditions (DM vs DM+CKD vs HF) and the SGLT2i used.

Conclusions: SGLT2i reduced the risk of cardiac arrhythmias. Our study provides further evidence for recommending the use of SGLT2i in patients with DM and HF, and further research is needed to fully elucidate the mechanism by which SGLT2i protects against arrhythmias.

Figure. Forest plots of meta-analyses.

(A) Atrial fibrillation (AF)

(B) Atrial flutter (AFL)

(C) AF/AFL

(D) Ventricular tachycardia (VT)

(E) Cardiac arrest

ABSTRACTS

E-Poster Presentation:

A6.

Angiopoietin-like Protein 2 is Associated with Exercise Tolerance in Patients with Chronic Heart Failure

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Objectives: Angiopoietin-like protein 2 (ANGPTL2) is a protein, whose structure of is similar to that of angiopoietin, but binds to a different receptor. Overexpression of ANGPTL2 promotes chronic inflammation and relates to the development of aging-related diseases. ANGPTL2 has been reported to be secreted by adipose tissue, vascular endothelial cells, and plaque nest macrophages. Recently, ANGPTL2 has been implicated in the pathogenesis of heart failure. Until now, there are no studies on the relationship between exercise therapy and serum ANGPTL2 levels in patients with heart failure. The aim of this study was to investigate the characteristics and related factors of ANGPTL2 in patients with chronic heart failure during the maintenance phase of cardiac rehabilitation.

Methods: The subjects included 57 patients (70.1±10.2 years old; 46 men) with chronic heart failure whose serum ANGPTL2 levels were measured during the maintenance phase of cardiac rehabilitation program. We excluded patients who were admitted or discharged from the hospital within 3 months before or after serum ANGPTL2 measurement. We evaluated exercise tolerance using the cardiopulmonary exercise test, grip strength, body composition using a body composition analyzer, blood examinations, and echocardiography. Serum ANGPTL2 was measured by centrifuging patients' blood samples to collect serum based on a solid-phase sandwich enzyme-linked immunosorbent assay (ELISA).

Results: The median value of ANGPTL2 was 4.045 ng/ml. ANGPTL2 was positively correlated with body weight, body fat mass, C-reactive protein (CRP) and total protein (TP) levels, and negatively correlated with skeletal muscle mass percentage and anaerobic threshold (AT). From the result of the logistic regression analysis, AT (OR=0.69, 95% CI:0.49-0.98) and TP (OR=22.63, 95% CI:2.79-183.70) were extracted as independent factors related to the level of ANGPTL2.

Conclusions: Exercise tolerance in patients with chronic heart failure during maintenance phase might be related to the inflammation marker ANGPTL2.

A7.

Exercise-based Cardiac Rehabilitation Improves Symptoms and Functional Abilities of Patient with Heart Failure Caused by Peripartum Cardiomyopathy

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Objectives: To report the effect of exercises in phase II cardiac rehabilitation (CR) on dyspnea, fatigue, six-minute walk distance (Six-MWD), metabolic equivalent (METs), and basic and instrumental activities of daily living (ADL) in patient with heart failure (HF) New York Heart Association class III with reduced ejection fraction (EF) caused by peripartum cardiomyopathy (PCM).

Methods: Female patient, age 32 years, was given a supervised-exercise programs for 12-week. Aerobic exercise was given 3 times a week, 30-40% of Heart Rate Reserve or 9-11 of Rating of Perceived Exertion, begin with 20 minutes, progress 5 minute every 2 weeks as tolerated. Flexibility exercise was given every single day, 1 set, 8 repetitions, applied to head-neck, shoulder girdle and upper back muscles. Isotonic resistance exercise was given twice a week, 30-40% of 1 repetition maximum, 1 set, 10 repetition, applied to quadriceps and biceps muscles, progress 2 repetitions every 1-2 weeks as tolerated. Before and after CR program, Modified Medical Research Council (mMRC) scale and Fatigue Severity Scale (FSS) was recorded to describe symptoms. Six-MWD, METs prediction with treadmill testing, Barthel Index (BI), and Lawton Instrumental ADL (Lawton-IADL) was measured to describe functional abilities. Education about activity management, environment modification, and energy conservation techniques was also given at the beginning of the program.

Results: After 12 weeks, MMRC and FSS decreased from 4 to 2 and 52 to 40, respectively. Six-MWD increased from 250 to 371 meters, METs increased from 5.27 to 6.95, BI score increased from 15/20 to 20/20, and Lawton-IADL showed improvement in food preparation, housekeeping, and laundry. Hemodynamic response was appropriate, no symptoms, ischemic response and arrhythmia during the first and second treadmill testing.

Conclusion: Supervised 12 weeks exercise-based CR improves symptoms and functional abilities of patient with HF with reduced EF caused by PCM.

ABSTRACTS

E-Poster Presentation:

A8.

Knowledge of Coronary Heart Disease Risk Factors in Rural Community in Indonesia: A Pilot Study

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Objectives: This study aims to evaluate knowledge of Coronary Heart Disease (CHD) risk factors in a remote area in Indonesia.

Methods: This is a descriptive cross-sectional pilot study that was carried out among a convenience sample of 108 adults. They participated in a non-communicable disease routine screening held by government primary healthcare in the local district located in Ketawang, Malang, East Java in July 2019. An Indonesian version of the Heart Disease Facts Questionnaire (HDFQ) was used to assess knowledge of CHD risk factors. Scores were calculated by summing the correct answers for each question (20 items). Inadequate knowledge was indicated by a mean score of <70%. Descriptive methods were applied to obtain frequency and multivariate logistic regression analyses were performed to evaluate participants' apprehension and recognize associated demographic variables.

Results: A total of 108 subjects were included in the study, 78 participants (72.2%) have adequate knowledge of CHD risk factors. Meanwhile, participants that were still unaware of CHD risk factors were 30 participants (27.8%). In this study, knowledge of CHD risk factors is significantly associated with the participants' level of education (odds ratio [OR]: 5.648, P=0.017).

Conclusion: Adequate knowledge levels of CHD risk factors were observed among the studied community sample in Indonesia despite their remote location. This situation showed that information about heart disease risk factors is accessible to everyone. Thus, this study increased the awareness of CHD among the local population in the suburban area, improve their quality of life, and promote them to engage in the cardiovascular preventive program.

A9.

Factors Influencing the Improvement of Nutritional Risk in Elderly Heart Failure Patients at Home

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Objectives: It has been shown that Nutritional status influence the prognosis of patients with heart failure. The purpose of this study was to investigate factors contributing to improved nutritional risk in elderly heart failure patients discharged from home after treatment for heart failure.

Methods: Seventy-three homebound elderly heart failure patients (mean age 84.5 years) who began home health care after being discharged from the hospital were included in the study. Nutritional risk was compared at discharge and 3 months after discharge. Nutritional risk was assessed using the Geriatric Nutritional Risk Index (GNRI) and judged to be severe, moderate, low, or absent. Patients with improved nutritional risk were designated as the improved group and those with no improvement were designated as the non-improved group. The survey items included age, gender, performance status, presence of hypertension, diabetes and dementia, blood test results after discharge (BUN, CRE, BNP, Hb, CRP, K, Na, Cl, and T-Bil), medications at discharge (tolvaptan, loop diuretics, thiazide diuretics, β-blocker, spironolactone, ACE/ARB inhibitors, nitrates, digoxin, anticoagulants, antiplatelet agents, and calcium channel blockers), items related to heart failure (NYHA, EF), and nutritional status (weight at discharge, GNRI, brachial circumference, and lower leg circumference) were extracted.

Results: At discharge, the GNRIs were absent in 19 patients, low in 11, moderate in 27, and severe in 16. Three months after discharge, there were 21 patients with absent, 21 with low, 25 with moderate, and 5 with severe. The improvement group consisted of 25 patients. At discharge, mean weight, circumference of the upper arm, circumference of the lower leg, GNRI and Hb were significantly lower in the improved group, and mean Cl was significantly higher in the improved group.

Conclusion: In elderly patients with heart failure at home, improvement in nutritional status during the first 3 months after discharge may be influenced by poor nutritional status at discharge and anemia, not by cardiac function at discharge or severity of heart failure.

ABSTRACTS

E-Poster Presentation:

A10.

Evidence-Based Translation of the Cardiac Rehabilitation Barriers Scale to Kannada (CRBS-Ka)

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Objective: Cardiac rehabilitation (CR) is associated with 20% reductions in mortality. Unfortunately, most patients do not access CR; this is particularly true in India, where the need for CR has been determined to be the greatest globally. Barriers include factors at the health system, referring provider, program and patient-levels. The Cardiac Rehabilitation Barriers Scale (CRBS) is a 22-item self-report scale which assesses these multi-level barriers, which has been translated to 14 languages, including 3 frequently-used in India. To enable administration of this questionnaire in Karnataka, India as well, the purpose of this study was to formally-translate the questionnaire to Kannada.

Methods: Best practices in translation and cross-cultural adaptation were applied. First the CRBS questionnaire underwent a forward translation from English to Kannada by an informed translator who was a cardiac nurse and uninformed translator (T-1 and T-2 respectively). It was then synthesized and any discrepancies were resolved leading to version T-12. The second step was a back translation from Kannada to English of the version T-12 by two native English speaking back translators (BT-1 and BT-2) and naïve to the purpose of the instrument. Thirdly, it was followed by an expert committee review consisting of all the four translators, one Methodist and one language professional to reach a consensus on any discrepancies or ambiguities and then establish a pre-final version (Kannada). Fourth, healthcare professionals then reviewed the scale to consider wording and ease of understanding. Fifth, this pre-final version was then administered to ten patients (4 angioplasties and 6 heart failure) from the Cardiology ward who were eligible for CR on the day of discharge.

Results: The multi-step process resulted in some changes to the initial translation. Healthcare providers and patients were satisfied with the clarity of the wording in the final version. It is available at: https://sgrace.info.yorku.ca/cr-barriers-scale/crbs-instructions-and-languages-translations/.

Conclusion: The CRBS-Ka may facilitate identification and mitigation of barriers in this region; testing the reliability and validity of the scale more widely is now warranted, as is established with other translations.

A11.

Effect of Exercise Intensity on Health-related Quality of Life in Patients with Acute Myocardial Infarction

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Objectives: Health-related quality of life (HRQOL) in patients with acute myocardial infarction (AMI) improves with exercise-based cardiac rehabilitation (CR). The anaerobic threshold (AT) is the gold standard for assessing the intensity of exercise during cardiac rehabilitation in Japan. However, the effects of exercise above the AT on HRQOL are unknown. The purpose of this study was to investigate the effect of exercise intensity on HRQOL in patients with AMI.

Methods: This study included 57 patients who were admitted to the outpatient CR unit with a diagnosis of AMI. The participants had a cardiopulmonary exercise test (CPX) and were randomly divided into two groups: the Over AT group had 25 patients who performed at an intensity higher than the AT, and the AT group had 32 patients who did not perform at an intensity higher than the AT. The following measurements were made during the CPX: maximum oxygen uptake (peak VO2), AT oxygen uptake (AT VO2), and the increase in oxygen uptake during exercise (ΔVO2/ΔWR). HRQOL was measured using the Short Form-36 (SF-36) questionnaire: Physical functioning (PF), Role physical (RP), Bodily pain (BP), General health (GH), Vitality (VT), Social functioning (SF), Role emotional (RE), Mental health (MH)), and isometric knee extension strength (IKES). Measurements were obtained at the start of exercise therapy and after 2, 3, and 4 months. The SF-36 was completed at baseline and at 4 months.

Results: Peak VO2, AT VO2, ΔVO2/ΔWR, and SF-36 significantly improved after 4 months in both groups. IKES improved in the Over AT group after 2 months. Peak VO2 was remarkably higher in the Over AT group after 2 months. After 3 months, AT VO2 and ΔVO2/ΔWR were significantly higher in the Over AT group. Moreover, RE and MH in SF-36 were significantly higher in the Over AT group after 4 months.

Conclusion: Exercise above AT intensity significantly improved RE and MH components of HRQOL compared to AT group. Our findings suggest that patients with AMI and stable cardiac function may benefit from exercise intensity above the AT.

ABSTRACTS

E-Poster Presentation:

A13.

Thioredoxin-interacting Protein Aggravates Myocardial Ischemia Reperfusion Injury In Diabetes Through NF-κB Signaling-mediated Inflammation

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Objectives: The exact reasons for greater myocardial ischemia reperfusion injury (IRI) in diabetes haven't been known. Thioredoxin-interacting protein (TXNIP) is a factor critically involved in glucose metabolism, and inflammation. This study explored the relationship between myocardial IRI aggravation and TXNIP activity in hyperglycemia. Also, cardio-protection by remote ischemic preconditioning (RIPC) in diabetes and association with TXNIP regulation were discussed.

Methods: Type 1 diabetic rats were induced by streptozotocin injection. RIPC was conducted as four cycles of 5-min ischemia and 5-min reperfusion at the lower limb for three days. Myocardial IRI was set as 30-min ischemia and 120-min reperfusion. Small interference RNA was transfected into H9C2 cells to knockdown TXNIP expression. Cells were subjected to 6 hours of hypoxia and 12 hours of reoxygenation (H/R).

Results: In consistence with cardiac injury degree, TXNIP significantly increased after myocardial IRI and even higher in diabetes. RIPC protected the diabetic heart with significantly reduced myocardial infarct size after IRI. Meanwhile, remarkable decline in TXNIP expression, NF-κB activation, and pro-inflammatory cytokine level after IRI were detected in diabetic rats treated by RIPC. In vitro study revealed that TXNIP knock-down significantly improved cell viability, reduced LDH release, alleviated apoptosis, inhibited IκBα/NF-κB activity, and suppressed the release of pro-inflammatory cytokines TNF-α, IL-1β, and IL-6 after H/R treatment in hyperglycemic condition. However, exogenous activation of NF-κB via PMA, even with TXNIP knock-down, cancelled the above cardio-protective effect with up-regulated pro-inflammatory cytokines, reduced cell viability, and greater apoptosis after H/R.

Conclusion: TXNIP could mediate myocardial IRI aggravation in hyperglycemic condition. Specific gene knock-down of TXNIP showed cardio-protection in hyperglycemia via suppressing IκBα/NF-κB signaling and pro-inflammatory cytokines. RIPC attenuated diabetic myocardial IRI, possibly via negatively regulating TXNIP and IκBα/NF-κB-mediated inflammation.

A15.

Home-Based Cardiac Rehabilitation to Address Evolving Patient Needs During the COVID-19 Pandemic

P Chockalingam,[1] V Natarajan,[1] T Sekar,[1] A Chockalingam[2]

[1]Cardiac Wellness Institute, Chennai, India; [2]University of Missouri, Columbia, USA

Objectives: Home-based cardiac rehabilitation (HBCR) and prevention programs (HBPP) which occupied a small proportion of the overall Preventive Cardiology work in the past have become mainstream during the COVID-19 pandemic. This study aims to analyse the design and delivery of HBCR/HBPP pre and during the pandemic to address evolving patient needs.

Methods: All patients who had undergone HBCR/HBPP at our Preventive Cardiology centre in Chennai, India till 22 March 2020 (pre-pandemic enrolees) and from 23 March-10 September 2020 (during-pandemic enrolees) were included. Hybrid programs had some in-person and some online/phone sessions; completely home-based programs had only online/phone sessions. Intake evaluation consisted of physician consultation, review of medical records, health-related lifestyle questionnaire, quality of life questionnaire, 24-hour diet recall and body mass index and functional capacity (FC) assessment. The six-minute walk test (6MWT) or the 2-minute step test (2MST) was used for FC assessment. A multidisciplinary team consisting of Physician, Physiotherapist and Dietician provided 1-2 sessions per week for 3-6 months. HBCR was offered to low/medium risk patients.

Results: Of the 29 subjects (57±13 years, 69% male), 16 (55%) were pre-pandemic enrolees and 13 (45%) during-pandemic enrolees. Completely home-based programs were provided to 4 (25%) of the pre-pandemic enrolees and to 13 (100%) of the during-pandemic enrolees (p=0.0002). Almost all pre-pandemic enrolees resided outside Chennai and travelled by air/train/road for in-person sessions in the hybrid program; an elderly woman residing in Chennai preferred the hybrid program, as she needed a caregiver to accompany her. Majority of pre-pandemic home-based sessions were phone calls whereas majority of during-pandemic sessions were online video sessions with supervised exercise and/or audiovisual presentation. FC was assessed using 6MWT in 17 (59%) and 2MST in 9 (31%) subjects; FC was not assessed in 3 pre-pandemic enrolees. No adverse events were reported.

Conclusion: Multidisciplinary HBCR/HBPP is an effective and safer alternative to traditional programs. There is potential to expand these services post-pandemic to all patients irrespective of place of residence and risk profile.

ABSTRACTS

E-Poster Presentation:

A16.

Role of Web-Based Programs in Heart Disease Prevention and Rehabilitation in the COVID-19 Era

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Objectives: Cardiovascular disease (CVD) is the leading non-communicable cause of mortality and morbidity globally. In-person education and awareness programs conducted as part of the CVD prevention efforts have either come to a standstill or have been replaced by web-based programs in the COVID-19 era. This study describes the design and execution of web-based programs to improve awareness and educate cardiac patients during the pandemic.

Methods: All web-based education/awareness sessions conducted since the start of the government-enforced lockdown in India till date (23 March - 10 September 2020) were included. A multidisciplinary team consisting of Physician, Physiotherapist and Dietician worked completely online to maintain continuity of service to previously enrolled patients and to develop comprehensive web-based programs for newly enrolling patients. Patient education sessions were incorporated into the home-based CVD prevention/rehabilitation programs, which also consisted of supervised exercise sessions. Web-based awareness programs about CVD prevention strategies during the pandemic were provided to corporate employees, paying special attention to the psychosocial challenges of working from home, and to the general public. Google Meet or Zoom was used for the audiovisual presentation followed by discussion.

Results: Our team provided 28 web-based education sessions and 6 awareness webinars for a total of 185 individuals during this period. The topics covered are provided in the Table. The enrolees and their family members actively participated in the sessions and interacted during the discussion. The feedback was that the communication was clear and that the online sessions were effective. The only barrier was the occasional technical snag or connectivity issue, which hindered the continuity of the session briefly.

Conclusion: There has been a huge sea change in the way healthcare has been delivered during the COVID-19 pandemic and CVD prevention services are no exception. Web-based programs with online sessions replacing in-person sessions are proving to be effective in patient education and awareness creation and might be the way forward even after the pandemic in resource-limited settings like India.

Table: Topics covered in Patient Education Sessions and Awareness Webinars

Patient Education Topics	Awareness Webinar Topics
Basics of heart health	Holistic heart health in the COVID-19 era
Fundamentals of healthy diet	Addressing the Work From Home Challenges
Overview of cardiovascular drugs	COVID-19 prevention strategies for CVD population
Relaxation strategies	Healthy Lifestyle for Occupational Wellness
Healthy cooking methods	Preventing lifestyle diseases through healthier choices
Overcoming barriers to healthy lifestyle	Stress management tenchniques for mental wellbeing

A17.

Added Value of Home Virtual Exercise in Cardiac Rehabilitation during COVID-19

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Objectives: Cardiac rehabilitation is the key component in optimizing physical function, reducing the cardiovascular risk and mortality for cardiac patients. However, as the coronavirus disease 2019 (COVID-19) pandemic has begun since the end of 2019, usual service is affected. Patients' compliance and attendance to exercise training is worth concern and the general recommendation of 150-minute per week of moderate intensity exercise is almost unachievable. The limitation of routine health care delivery is explored. In order to increase patients' physical activity and prevent secondary complication, the Cardiac Society of Australia and New Zealand (CSANZ) recommended health care profession continued to deliver evidenced-based strategies with the use of electronic health platforms as it was more accessible during the pandemic. This study sought to examine the value of home virtual exercise in cardiac rehabilitation during COVID-19.

Methods: Twenty-eight patients were recruited from the Cardiac Rehabilitation program (CRP) in Tseung Kwan O Hospital between December 2019 and August 2020. Patients who attended the CRP were under usual care receiving 1.5-hour center-based training 1-2 times per week. The home virtual exercise which was circuit training was given via QR code. All patients completed 12-sessions of CRP. Patients' safety, body weight and body mass index (BMI), 6 Minutes Walk Test (6MWT) distance, Five Times Sit To Stand (FTSTS) and Cardiac Exercise Self-Efficacy Instrument (CESEI) were measured at baseline and at end of 12th session.

Results: No adverse events were reported in relation to home virtual exercise. Although there were no statistically changes in body weight and BMI (p>0.109), there were significant improvement in 6MWT distance (p=0.000), FTSTS (p=0.000) and CESEI (p=0.007).

Conclusion: Home virtual exercise appears to be safe and effective for patients to exercise at home during COVID-19. Improvement in functional capacity and self-efficacy were observed, therefore, suggesting that home virtual exercise could be used in addition to center-based training to improve cardiovascular risk. Cardiac rehabilitation specialists should consider using electronic platforms during the pandemic to deliver exercise regimes. Future study is needed to explore the long-term effects of virtual exercise after program completion.

ABSTRACTS

E-Poster Presentation:

A19.

The Outcome of the Brief Phase II Cardiac Rehabilitation Program on Health-related Quality of Life for Patients with Coronary Heart Disease

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Objectives: Coronary heart disease (CHD) comprising 67% of all heart disease deaths in Hong Kong. CHD increases mortality and morbidity, and induces negative impacts on the physiological, psychological, and social aspects of individuals (Benetti et al, 2010). These factors will greatly impair individuals' quality of life (Sandstrom & Stahle, 2005). Phase II Cardiac Rehabilitation Program (CRPII) is designed to enhance secondary prevention and adoption of healthy lifestyle for patients after coronary events. This study is to evaluate the outcome of the brief CRPII on Health Related Quality of Life (HRQOL) in patients with CHD.

Methods: Quasi-experimental pre-post study was conducted to patients with CHD recruited to CRPII in PMH from 1 April 2018 to 31 December 2019. Patients would have undergone the multidisciplinary program in open group format including educational talks and exercise sessions with relaxation. The Chinese version of Short Form 36 Health Status Survey (SF-36) was administrated by the occupational therapists at the first and the last session of the CRPII for evaluating the HRQOL scores. Paired t-test was used to compare the pre-post SF-36 scores. Multiple regression was used to predict the difference of HRQOL scores from sex, hypertension (HT), diabetes mellitus (DM), hyperlipidemia, obesity, smoking status and drinking status.

Results: 122 participants (81% males;19% females) with mean age and BMI of 60.6 (SD=8.36) and 26.3 (SD=4.87) were recruited into the study. More than half of them were with HT and hyperlipidemia while one-third was with DM. Five participants(4%) were existing smokers and more than one-third were drinkers. All patients had undergone percutaneous coronary intervention. For SF-36, there was statistically significant increase in all health domain scores (p<0.05) especially in Physical Functioning, Bodily pain, General Health, Vitality and Social Functioning (p<0.001). There was no statistically significant predictor for the change of HRQOL scores from the tested variables (p>0.05). Participants with drinking habits (p=0.049) and hyperlipidemia (p=0.044) may be potential predictors in experiencing less bodily pain after CRPII (R2=0.147; p=0.031).

Conclusion: The brief CRPII in PMH is effective in improving the HRQOL of patients with CHD. It has given more confident on professionals to further develop the cardiac rehabilitation program in PMH.

A20.

Has Advancement in the Field of Interventional Cardiology Mitigated the Risk of Adverse Outcomes Following PCI in Women?

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Objective: Improvement in secondary prevention and progress in revascularization techniques have led to 45.7% decline in mortality following myocardial infarction. However, women are still being less referred for PCI - a life saving procedure, due to the perceived risk of adverse outcomes following PCI attributable to high risk factors, unfavourable coronary anatomy and plaque composition in women. This study was conducted to determine the influence of revolutionized interventional cardiology in mitigating the peril of worst outcomes following PCI in women; as previous studies have been inconsistent in this regard.

Methodology: A prospective study was conducted from January 2016 till December 2018 in the Coronary care unit of Aga Khan University Hospital. Total 184 patients who underwent PCI were included and equally divided into two groups; males as group A and females as group B. Thirty days outcome measured in terms of mortality following PCI was noted. Chi-square test was applied to compare the mortality in both groups. Relative risk (RR) was calculated. Post stratification Chi-square/ Fisher exact test was applied.

Results: Women compared to men were significantly more diabetic 60.9% versus 29.3%, and hypertensive 83.7% versus 46.7%. However, there were no significant difference between men and women in terms of dyslipidemia, past history of ischemic heart disease and prior history of PCI which were 15.2%, 16.3%, and 14.1% respectively in men and 23.9%, 28.3%, and 12% respectively in women. There was 8.7% mortality in women contrary to none in men (p-value 0.007). Significant association of mortality with gender was observed with relative risk 2.095 for women in the era of advanced Interventional cardiology. Causes of mortality within thirty days following PCI in women are shown in Table-1.

Conclusion: Despite advancement in the field of interventional cardiology, female gender is associated with an apparent hazard of increased mortality following PCI which persists even after adjustment of differences in baseline risk factors.

TABLE - 1
FREQUENCY DISTRIBUTION OF CAUSES OF MORTALITY
WITHIN 30 DAYS AFTER PCI IN GROUP B (WOMEN)

Causes of mortality within 30 days post PCI	Frequency	Percentage
Atrial fibrillation	1	12.5%
Post procedure MI	5	62.5%
Renal Failure	1	12.5%
Ventricular fibrillation	1	12.5%
Total	8	

ABSTRACTS

E-Poster Presentation:

A22.

Blood Glucose and Risk of Cardiovascular Disease Among Children & Adolescents of Asian Indian Origin

PS Datta

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Objectives: The purpose of this cross-sectional study was to find out the prevalence of blood glucose and other CVD risk factors in children and adolescents of Asian Indian origin.

Methods: A total of 1101 (532 boys and 569 girls) children and adolescents were took part in this study, aged 10 to 17 years from West Bengal, India. Nine Anthropometric measurements, such as stature, body weight, circumferences at mid arm (MUAC), minimum waist (MWC) and maximum hip (MHC), skinfolds at biceps (BSF), triceps (TSF), sub scapular (SSSF) and supra iliac (SISF) regions etc., were measured using standard technique. Blood glucose and lipid profiles were measured from each participant. Systolic (SBP) and Diastolic (DBP) blood pressure were also recorded according to a proper methodology. A schedule was used to collect data on the socio-economic status, birth records, behavioral activity, weekly physical activity and family history of hypertension & diabetes.

Results: The urban participants have higher mean values of weight, stature, body mass index (BMI), minimum waist circumference (MWC), maximum hip circumference (MHC) and waist-hip ratio (WHR) in all age and sex groups. Mean values of blood glucose and lipid profile are slightly higher in the urban participants. Significantly, mean values of systolic blood pressure (SBP) & diastolic blood pressure are almost similar in participants from different habitat variation. Beside this, no significant sex difference is observed for SBP and DBP. Sedentary lifestyle and faulty food habits was found to be significant association with blood glucose level.

Conclusion: The study showed that the prevalence of CVD risk factors was high in both urban, sub urban and rural participants. Since diabetes mellitus usually starts mid and late adult age in life, the cardiovascular morbidity & mortality will be enormous in later life of the participants, if these trends continue. Prevention should begin during early ages in life, when a modification in lifestyle can reduce the incidence of cardiovascular disease. Therefore, there are need an effective preventive strategy, targeting the children & adolescent to encourage and improve their unhealthy life style, so that they do not become the epidemics of the 21st century.

A23.

Effect of Diaphragmatic and Chest Expansion Resistance Training on Inspiratory Capacity and Endurance of Athlete: Protocol for Randomized Controlled Trial

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Objective: Aerobic endurance performance is dependent on maximal oxygen uptake (VO2max). VO2max and Inspiratory capacity help in endurance athlete to enhance their performance in sport.

Methods: 30 male endurance athletes aged 18-30 years without any history of recent illness or surgery will be included. Participants randomly selected into two groups, treatment protocol is for four weeks in both the groups, experimental as well as conventional. In experimental group, diaphragmatic resistance training, diaphragm PNF and chest resistance training (chest expansion exercises) and usual sports practice sessions, are given thrice a week. In conventional group, only chest expansion exercise and usual sports practice sessions are given to the participants.

Result: There may be significant improvement in endurance, inspiratory capacity, and performance of player by using chest expansion resistance training on accessory muscles of respiration and diaphragm.

Conclusion: This study will help athlete to enhance their endurance and inspiratory capacity to help them in performing well and improve their sport.

ABSTRACTS

E-Poster Presentation:

A24.

Effects of Fermented Soy Foods on Metabolic Syndrome Among Adults: A Literature Review

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Background: Metabolic syndrome (MetS) describes as a collection of cardiometabolic conditions that higher the risks of cardiovascular diseases, diabetes, and overall mortality. It becomes a global health care crisis due to higher medical costs on individuals with MetS, with more than US$2000 yearly and around one quarter increase in the cost of health care with each additional risk factor. An unhealthy lifestyle, especially inactive individuals are highly prone to develop with MetS. Although, the usual treatments include exercise and drug therapy to managing the problems with effects, numerous potential side effects and poor adherence are observed. Fermented soy foods (FSFs) such as natto, miso, and chungkookjang as a functional food with an abundance of the bioactive compounds that have many potential health benefits and positive outcome on diabetic and obese individuals.

Aim: This literature review is to evaluate the existing studies and evidence on individuals with MetS ingestion of the FSFs on improving cardiometabolic conditions include raised blood pressure, hyperlipidemia, obesity, higher waist circumference and poor glucose control.

Method: Available studies and literature were searched and identified through Cochrane Library, MEDLINE, ScienceDirect, BioMed Central and PubMed on the effects of fermented soy foods on adults with MetS.

Results: Results indicate the positive outcomes of FSFs on physical anthropometric data of individuals with MetS, which included: lowering blood pressure, improving serum lipids (e.g. decrease in serum triglycerides, low density lipoprotein cholesterol, increase in high density lipoprotein cholesterol); reducing serum glucose levels, reducing in body weight and abdominal visceral fat.

Conclusion: The literature review identified the positive outcomes of FSFs in managing on adults with MetS. Based on the findings of the present review, further research and systematic review in this area is needed to explore the type, amount/ dosage and frequency of consumption of FSFs on individuals with MetS.

ABSTRACTS

E-Poster Presentation:

A25.

Arab Health Promoters' Perspectives on Religious/Cultural Challenges to Adopt Healthy Lifestyle Behaviours Among Arab Immigrants in Canada

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Background: Adopting healthy lifestyle behaviours and managing stress is the target of primary and secondary prevention in cardiac rehabilitation programs. Unfortunately, Arab immigrants tend to have higher levels of risk factors for cardiovascular diseases. Despite the importance of faith and cultural background in Arab immigrants' lives, little is known about their role among this population to prevent cardiovascular diseases.
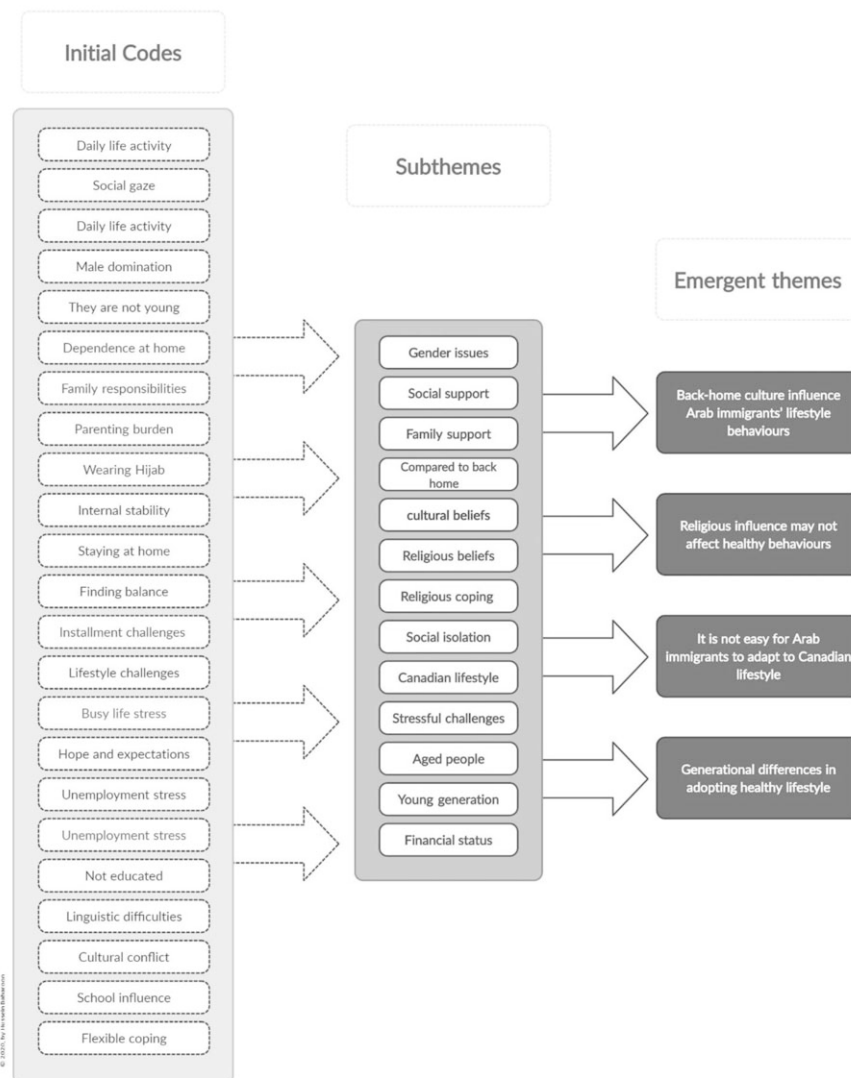
Objective: To understand the challenges related to acculturation and religion in adopting healthy lifestyle behaviours and managing stress among Arab immigrants.

Method: Three face-to-face focus groups were conducted with 17 Arab health promoters who are members of the Canadian Arabic Health Coalition. On average of 80 minutes in length, focus groups were conducted in Ottawa, Canada, in February and March 2018. Transcripts were analyzed with an inductive content analysis approach to identify themes.

Results: Focus group participants shared both; their work experiences as health promoters to the Arab community and their personal experiences as Arab individuals living in Canada. Data were coded into four themes: back-home culture influence Arab immigrants' lifestyle behaviours, religious influence may not affect healthy behaviours, it is not easy for Arab immigrants to adapt to Canadian lifestyle, generational differences in adopting a healthy lifestyle.

Conclusions: Some religious or cultural beliefs may be barriers to practicing physical activity, especially for women and older people. These barriers may be augmented with acculturative stress. As well, religion may play an important indirect role in managing stress through socialization, family support, and adoption of coping strategies. Younger people in Arabic communities appear to be more flexible in dealing with these religious/cultural issues. To further explore and expand these findings from the patient's perspective, follow up studies are currently being conducted.

ABSTRACTS

E-Poster Presentation:

A26.

Determinants of Exercise Intensity Achieved During Exercise Prehabilitation Program for Patients Awaiting Cardiac Surgery

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Objectives: This is a sub-study of an ongoing randomised controlled trial, PREQUEL (ChiCTR1800016098) which examines the effect of a hospital-based exercise prehabilitation program. The objective was to evaluate the most relevant determinants of the exercise intensity achieved by the participants in the cardiac prehabilitation program.

Methods: This exercise prehabilitation program, supervised by a physiotherapist, was performed at a university hospital in Hong Kong. Multiple regression was performed to examine the potential determinants affecting exercise intensity achieved, including (i) age, gender; (ii) frailty level, presence of cardiovascular risk factors; and (iii) prehabilitation-related factors: length of time available for prehabilitation before surgery, and total number of training sessions on the average and maximum exercise intensity achieved by pre-frail and frail patients (Clinical Frailty Scale [CFS 4-6]) during prehabilitation between July 2018 and September 2020. We estimated the proportion of total variance explained by the model (R^2) and the relative importance of each factor using the "rego" package for STATA software.

Results: Of the 29 participants (8 females, 21 males), 3 were frail (CFS 5) and 26 were pre-frail (CFS 4). The median (IQR) prehabilitaiton duration was 7 weeks (5-11 weeks), and number of training sessions was 7 (6-12). The median (IQR) of the average and maximum exercise intensity achieved by participants during the prehabilitation period was 71% (57%-93%) and 112% (83%-146%) of baseline predicted peak oxygen consumption reserve (VO2R) respectively. The multiple regression model for average exercise intensity accounted for 48% of the total variance, with the greatest relative contributions provided by the length of time ($\geq$8 weeks) for training available (48%) and total number of training sessions ($\geq$8 sessions) completed (23%) (Table 1). Similar results were found for the maximum exercise intensity model.

Conclusion: The training time available, rather than age, gender, frailty, cardiovascular risk factors, and the number of sessions completed before surgery was the significant factor associated with the exercise intensity achieved.

Table 1. Determinants of mean exercise intensity in cardiac prehabilitation patients (n=29)

Independent variable	β [a]	95% CI	P value	R^2	RC [b]
Overall model				0.48	*100*
Intercept	64.62	43.19 – 86.05	<0.001		
Demographic					*2.96*
Age (per unit from 65 years)	0.20	-0.77 – 1.16	0.68	0.64	
Male	2.41	-22.93 – 27.75	0.85	2.31	
Illness burden					*25.85*
Frailty (CFS = 5)	-11.51	-54.80 – 31.78	0.59	11.50	
Presence of any CV risk factor	-11.38	-30.53 – 7.76	0.23	14.34	
Prehabilition					*71.20*
Training time available ($\geq$8 weeks)	22.57	5.99 – 39.16	0.01	47.84	
Number of sessions ($\geq$8 sessions)	11.27	-7.48 – 30.01	0.23	23.36	

Italicised RC represent the summation of relative contribution of subcategories.
CFS, Clinical Frailty Scale; CV, cardiovascular
[a] Regression coefficient.
[b] Relative contribution (%) to the overall R^2 of the model.

ABSTRACTS

E-Poster Presentation:

A27.

Self-Directed Cardiac Rehabilitation using Game-based Mobile Application Paired with Sensor: A Pilot Feasibility Study

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Objectives: Cardiac rehabilitation (CR) is a known secondary prevention strategy to reduce cardiovascular mortality and morbidity. Despite proven benefits, CR uptake remains low. Home-based CR facilitated by mobile technology has shown promise in improving CR rates. However, there is a paucity of data on usage of game-based mobile applications for CR. This pilot study aimed to develop a game-based mobile app (Heart Track™) for self-directed CR and determine its feasibility, usability and acceptability.
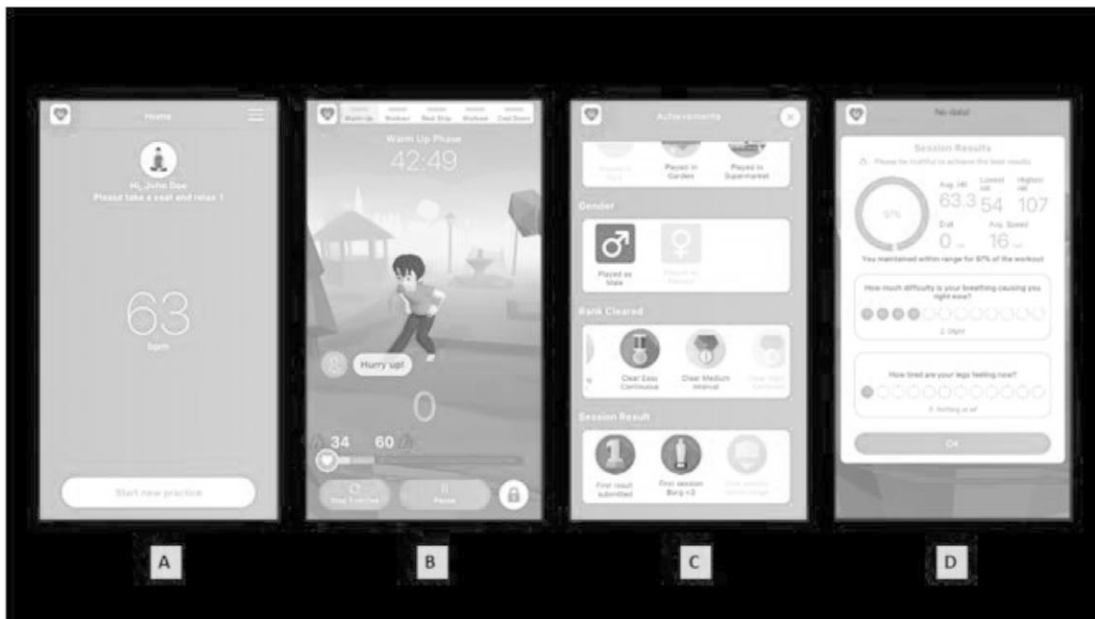
Methods: Subjects who underwent coronary revascularization for acute myocardial infarction (MI) were recruited. They were shown how to use Heart Track™ and instructed to complete at least 2 app-guided exercise sessions at home during a 1-week trial. Patients then completed Mobile Application Rating Scale (MARS) and usability questionnaires on Heart Track™, and participated in a semi-structured interview.

Results: Twelve subjects (mean age of 68.1 years) were recruited. Majority (11/12; 91.7%) were male. Median (range) number of exercise sessions completed was 4.5 (2-16). On the MARS questionnaire, overall mean app quality score for Heart Track™ was 3.3/5. On the usability questionnaire, over 70% of subjects reported they were comfortable using, and satisfied with, Heart Track™. Subjects also found the app useful in increasing exercise frequency and intensity.

Conclusions: To our knowledge, Heart Track™ is the first game-centric, home-based mobile health solution to CR in Singapore. Heart Track™ was found to be usable and acceptable, and CR patients were overall satisfied with the app. This pilot also provided insights on CR patients' expectations of a game-based mobile app for home-based CR. These insights will be useful for the refinement and enhancement of CR related mobile app to improve user experience.

Fig. 1. Screenshots of Heart Track™, a novel, gamed-based mobile application for home-based cardiac rehabilitation. Patients were prescribed tailored exercise programs based on their resting HR (**A**), measured by the Polar® OH1 wearable HR monitor which was synchronized with the app. Gamification elements in the app such as avatars (**B**) and unlocking achievements (**C**) engaged the patients and motivated them to exercise. At the end of each exercise session, patients were able to view their results and self-report symptoms they experienced (**D**).

ABSTRACTS

E-Poster Presentation:

A28.

Trends in Cardiac Rehabilitation Enrollment Post-Coronary Artery Bypass Grafting Upon Implementation of an Institutional Clinical Pathway-Based Automatic Referral System in a Low-Resource Setting

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Objectives: Cardiac rehabilitation (CR) is an effective but underutilized intervention, including in the Philippines. Strategies have been identified to increase its use. We sought to determine the effect of an institutional clinical pathway-based automatic referral system on CR enrollment post-coronary artery bypass graft (CABG) surgery, in comparison to the usual referral system at the discretion of the attending physician. There is paucity of data on automatic referral in low-resource settings.

Methods: The paper-based pathway was introduced in 2012 at the Philippine Heart Center. The checklist with CR referral on the third day post-operation triggered a CR nurse to educate the patient about CR, initiate Phase 1 and encourage enrollment in Phase 2. Some patients are not eligible for the pathway due to administrative or clinical reasons (e.g. high risk patients). Patients completing most of Phase 1 are eligible for Phase 2 coverage. This was a retrospective cohort study of consecutive post-CABG patients enrolled to Phase 2 CR from 2012 to 2019. Enrollment was defined as attendance of at least a first CR visit. Characteristics of patients who enrolled following the usual referral were compared to those via the automatic referral pathway.

Results: Three hundred and ninety-four patients (mean age=59.2+9.8 years, 84.4% males) enrolled in Phase 2 CR during the study period. Significantly more patients enrolled via the automatic referral system compared to usual referral (225 [57.1%] vs. 169 [42.9%]; OR=2.2, 95% CI=1.8-2.7), with great increases up to 23.4% enrollment in 2014 (vs average enrollment rate of 5.9% under usual referral; Figure 1). Patients who enrolled following automatic referral were significant younger and more often employed; no other differences were observed.

Conclusion: An institutional clinical pathway-based automatic CR referral strategy is associated with improved enrollment to Phase 2 CR, although sustained efforts to maintain this effect is required. Automatic referral may also reduce some disparities in access. Given the volume of CABG procedures done annually and the capacity of the CR program, more should be done to increase access and overcome the barriers to enrollment.
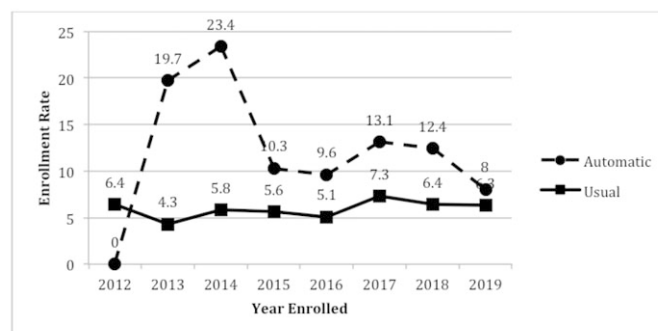

Figure 1. Trends in Enrollment to Phase 2 Cardiac Rehabilitation from 2012 to 2019

A30.

Is Cardiac Rehabilitation Equally Effective After PCI and CABG? The First Experience from the Eastern Mediterranean Region

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Objectives: There are only limited data on the effects of cardiac rehabilitation (CR) programs on patients with either percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG). The aim of this study was to compare the effects of phase II comprehensive CR in patients recruited following either PCI or CABG on coronary heart disease risk factors, psychological variables, and functional capacity in patients from the Eastern Mediterranean region.

Methods: For this retrospective study, the CR center medical records from 2008 to 2018 were reviewed. Essential assessments were performed before and after the 8-week program. Age, sex, smoking status, clinical data (resting heart rate (HR), resting systolic and diastolic blood pressure (SBP and DBP, respectively), and echocardiography), and laboratory data consisting of lipid profile and fasting blood sugar (FBS) were obtained. Functional capacity was evaluated using the international physical activity questionnaire, and a treadmill exercise test with maximum HR and both SBP and DBP. Anxiety, depression, general quality of life (QoL), and health-related QoL were selected for psychological status.

Results: Following CR, resting HR, but neither SBP nor DBP, decreased significantly (p=0.02) in patients with CABG. Although low-density lipoprotein-cholesterol and total cholesterol levels did not change in either group, FBS (p=0.01) and triglycerides (p=0.01) levels decreased significantly in patients with PCI. While maximum HR increased significantly (p=0.01) in patients with PCI, no other significant functional capacity difference was observed between patients with either PCI or CABG. The CR program was equally effective in patients with either PCI or CABG.

Conclusion: Both PCI and CABG patients from the Eastern Mediterranean region benefit significantly, and to the same extend, from CR. Therefore, it signifies that CR should be supported by the health-care insurances, noticed by policymakers, and recommended by the physician to both groups.

ABSTRACTS

E-Poster Presentation:

A31.

Comprehensive Inpatient Assessment Phase 1 in Cardiac Rehabilitation for Congestive Heart Failure Patient Due to Hypertensive Heart Disease

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Objectives: To describe a comprehensive assessment of Phase I in Cardiac Rehabilitation (CR) for Congestive Heart Failure (CHF) due to Hypertensive Heart Disease (HHD) and Diabetes Mellitus Type 2 (DMT 2) patient.

Methods: A 57-year old female patient was consulted from the High Care Cardiac Unit (HCCU) because of CHF et causa HHD with Acute Kidney Injury (AKI) on Chronic Kidney Disease (CKD). One year ago, she already felt breathless. It became progressive in the last four months. Therefore she needed help sometimes for her daily activities. She felt breathless after walking for more than 5 minutes or going upstairs and tired when eating. Since six months ago, she had edema on her legs and arms and complained of decrease sensibility in both lower legs. She slept with 2-3 pillows and often woken up at night because of the breathless. She also had hypertension and DMT 2 but was controlled by medications. Thorax x-ray showed bilateral effusion and lung edema. Ultrasonography shown suggestive congestive hepatopathy. Laboratorium results were anemia, hypoalbuminemia, high fasting blood glucose, urea, and creatinine values. She had problems in the cardiorespiratory system, cardiopulmonary endurance, mobilization, and nutrition. She got phase 1 cardiac rehabilitation, including proper bed positioning, turning every 2 hours, chest expansion and deep breathing exercises, flexibility exercise, mobilization in bed while sitting with support, and evaluate functional assessment (MMRC) for dyspnea. Education given was about adequate nutrition and diabetic foot care.

Results: This patient had many metabolic problems. Thus the implementation of CR should notice about those concerns more than usual. She would need more time to do her daily activities independently because it could be done if her medical condition was stable. After getting a phase 1 cardiac rehabilitation program, she had already independent in doing her activities daily living in the second week of hospitalization. The symptoms and functional outcomes showed some improvements.

Conclusion: This comprehensive management is necessary to implement phase 1 CR by considering the patient's medical condition's stability.

A33.

Characteristics of Clients in Cardiac Work Rehabilitation Program: 4 Year Review

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Introduction: As younger population with acute cardiac event is increasing, more public attention is shifted to the work resumption of the survivors. Pilot cardiac work rehabilitation program of Occupational Therapy Department of Princess Margaret Hospital has started since 2014, it aims to facilitate the cardiac patients to have early return to work.

Objectives: (1) to review the characteristics of cardiac patient in early work resumption from May 2014 to May 2018; (2) to explore the influencing factors for early return to work.

Methodology: Cardiac patients referred for work rehabilitation from May 2014 to May 2018 were recruited. Independent t-test was used to evaluate and compare the sociodemographic characteristics and other clinical data to identify the predictive factors of early work resumption.

Results: 80 patients with the mean age of 54.2 (SD=8.0) were referred to the cardiac work rehabilitation program during the report period. Most patients were male (95%) and suffered from myocardial infarction (93.8%). Sixty-six patients completed the program were divided into 2 groups (Group 1 and Group 2). Group 1 contained 51 (77.3%) participants who attended work assessment only. Group 2 patients (15, 22.7%) required training after initial work assessment. Patients in group 1 resumed work significantly sooner than Group 2 (29.7 Vs 76.7 days, p<0.001). They attained significantly higher level of metabolic equivalent of task at treadmill exercise test (MET 8.4 Vs 7.2, p=0.031). Group 1 patients also preformed significantly better in psychosocial outcomes particularly in mental health (80.1 Vs 69.3; p=0.030) and anxiety level (6.2 Vs 10.5, p=0.018).

Conclusion: Apart from physical fitness, psychological wellness is proved to be a vital influencing factor for early work resumption after cardiac events. This finding echoes a lot of recent studies which highlighted the importance of psychosocial intervention in cardiac work rehabilitation program.

ABSTRACTS

E-Poster Presentation:

A34.

Use of Telehealth for Cardiac Rehabilitation in a COVID-19 Pandemic Hospital in Singapore

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Objective: In light of the COVID-19 pandemic, many cardiac rehabilitation (CR) programs were stopped throughout the world (Besnier et al., 2020). Tan Tock Seng Hospital(TTSH) was the main public hospital in Singapore responsible for caring for patients infected with COVID-19 and was key in fighting the war against COVID-19 (Wong et al., 2020). There was thus a need to review usual practices in CR and shift towards using telehealth to continue care for post-myocardial infarction patients (Yeo et al., 2020). A CR nurse-led telephonic consult service was thus started to provide counselling, education and symptoms review for post-myocardial infarction patients presenting to TTSH. The aim was to minimize the number of visits to the hospital, reduce exposure to potential risks, and also provide ongoing counselling and advice to patients within the cardiac rehabilitation program. We then interviewed these patients to determine their level of understanding and satisfaction.

Methods: 18 patients were recruited for the CR telephonic nurse consultation 2-3 weeks post discharge from hospital after an acute myocardial infarction between February 2020 to August 2020. During cardiac rehabilitation consultation, the nurse will follow up on the patient's home recovery, conduct risk factors review and counsel on behaviour modification and coping strategies. A short 4 question survey was administered verbally over the phone at the end of the telephonic consultation to evaluate patient's knowledge, self-efficacy, perception of the service.

Results: 89% of patients had shown a better understanding of their heart condition after the telephonic nurse consultation. 83% of patients expressed to have more confidence in managing their heart condition despite not presenting physically to a hospital to see a physician. 83% of patients found telephonic nurse consultation to be useful in helping them maintain a heart healthy lifestyle even during a pandemic.

Conclusion: The use of telephonic nurse consultation was met with high levels of patient satisfaction and most patients had a better knowledge of their heart conditions. Telehealth should continue to be an important option for outpatient care even beyond the end of the COVID-19 pandemic with further consideration of telecare with remote monitoring, video consults and tele rehab options.

A37.

The Correlation Between Anemia and Renal Function to Quality of Life (QoL) in Patients with Heart Failure Reduced Ejection Fraction (HFrEF)

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Objective: The essential target in managing patients with heart failure reduced ejection fraction (HFrEF) beside reduced the mortality is a good quality of life (QoL). This study aims to analyze the correlation between anemia and renal function (eGFR) with QoL in HFrEF patients.

Methods: A cross-sectional study was conducted in heart failure clinic of Hasna Medika Cardiovascular Hospital Cirebon, Indonesia. This study used an accidental sampling on HFrEF patients who had received medication in heart failure clinic for at least 6 months. We excluded patients with motoric impairments such as post stroke. Data were taken from medical records, and QoL was assessed using Kansas City Cardiomyopathy Questionnaire (KCCQ)-12. The data were processed using SPSS-25. Correlation was analyzed using Chi-square with P<0.05.

Results: A total of 145 HFrEF patients were enrolled, consisted of 69.7% male, 30.3% female. The sample average age were 58 years with 74.5% sample ≤65 years. Almost one-third of samples had anemia (29.7%) and 44.8% with eGFR ≤60 ml/min/1.73 m^2. This study showed that anemia (p=0.012, OR = 2.967, 95% CI 1.239-7.103) and eGFR (p=0.006, OR=3.447, 95% CI 1.387-8.566) were correlated with QoL. Anemia and eGFR were not correlated with rehospitalization in HFrEF patients with p=0.082 and p=0.628 respectively.

Conclusions: Anemia and renal function (eGFR) were significantly correlated with decreased of QoL. Prevention of anemia and evaluation of renal function were essential component in managing patients with HFrEF.

ABSTRACTS

E-Poster Presentation:

A38.

Ventilatory Inefficiency by Cardiopulmonary Exercise Test Predicts Cardiovascular Outcomes in Heart Failure Outpatients

SM Chen,[1] LY Wang,[2] PJ Wu,[1] MY Liaw,[2] YL Chen,[1] AN Chen,[3] TH Tsai,[1] CL Hang,[1] MC Lin[4]

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Objectives: Chronic lung disease, especially ventilatory inefficiency measured by cardiopulmonary exercise test (CPET), influenced clinical outcomes in heart failure (HF) patients. We aimed to evaluate the ventilatory inefficiency in predicting clinical outcomes in HF outpatients.
Methods: In total, 169 HF outpatients underwent the cardiopulmonary exercise test (CPET) and were followed up for a median of 9.25 years. The primary endpoints were CV mortality and first HF hospitalization. The various CPET parameters were evaluated as predictors of primary endpoints by performing time-dependent receiver operating characteristic curve analysis. Ventilatory inefficiency was defined as VE/VCO2 at AT >34.3, an optimized cutoff point. The comparative results of primary endpoints between patients with left ventricular ejection fraction (LVEF) ≥50% (HFpEF) and those with LVEF <50% (non-HFpEF) with or without ventilatory inefficiency were analyzed.
Results: Among various CPET parameters, the VE/VCO2 at AT were the most significant predictors of our primary endpoints. HFpEF patients had better clinical outcomes than non-HFpEF patients in the long-term follow-up period. But this phenomenon disappeared in patients with ventilatory inefficiency.
Conclusion: In conclusion, ventilatory inefficiency by CPET is a significant prognostic predictor in HF outpatients, especially in HFpEF patients. Ventilatory inefficiency can be used as a therapeutic target in HF management.

Variables	Non-HFpEF	HFpEF	p Value	Non-HFpEF with Ventilatory Inefficiency	HFpEF with Ventilatory Inefficiency	p Value
Primary endpoints	27 (48.2%)	22 (19.5%)	<0.0001	17 (58.6%)	15 (51.7%)	0.792
Cardiovascular mortality	12 (21.4%)	6 (5.3%)	0.001	9 (31.0%)	5 (17.2%)	0.358

LVEF: left ventricular ejection fraction; HFpEF: heart failure with preserve ejection fraction (LVEF ≥ 50%); non-HFpEF: heart failure with LVEF <50% (i.e., mid-range (LVEF 40–49%) and reduced ejection fraction (LVEF < 40%); ventilatory inefficiency: VE/VCO2 at AT (ventilatory equivalent for carbon dioxide at anaerobic threshold) >34.3.

ABSTRACTS

E-Poster Presentation:

A40.

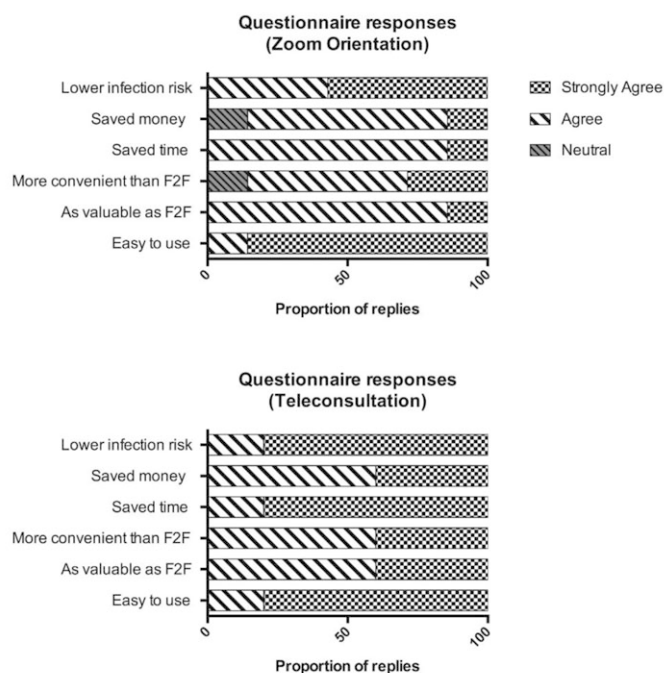### Utilisation of Telehealth in Cardiac Rehabilitation – Patient Perspectives

K Desai, SP Lim, G Kayambu, QS Gani, S Poojari, SH Lee, C Wee, SM Lai, HN Ng, MC Ong, LS Ooi, WF Chong, K Koh, TJ Yeo

National University Heart Centre, Singapore

Objectives: Cardiac rehabilitation (CR) exercise classes in Singapore were either cancelled or suspended due to the ongoing COVID-19 pandemic. In response, a hybrid CR programme utilising telehealth was created to reduce reliance on in-person sessions. Our study aimed to assess early patients' impressions of this novel CR delivery method.

Methods: Each hybrid CR programme comprises: (a) one CR orientation session via the Zoom video conferencing platform where patients interact with CR nurses and physiotherapists, (b) two 6-minute walk test fitness assessments (at baseline and upon completion), (c) five in-person supervised exercise classes and (d) two teleconsultation sessions (scheduled after exercise sessions 2 and 4) where CR physiotherapists review symptoms and discuss exercise prescriptions with patients over the phone. Upon programme completion, patients filled 2 anonymous online questionnaires – one assessing the videoconferencing component and another assessing the teleconsultation component and overall programme.

Results: Seven patients underwent the hybrid CR programme. The majority were male (n=6, 86%), aged between 51 to 65 years (n=4, 57%) and had previously used a wide range of mobile applications (n=6, 86%). 100% of patients either agreed or strongly agreed that both videoconferencing and teleconsultation were: (a) easy to use, (b) as valuable as in-person sessions, (c) saved time and (d) had lower infection risk compared to in-person sessions (Figure). The overall ratings for videoconferencing, teleconsultation and the hybrid programme were 9.3, 9.6 and 9.6 (out of 10) respectively. All patients would definitely recommend the programme to others.

Conclusion: Responses by participants of a novel hybrid CR programme utilising telehealth are highly encouraging. From a patient perspective, incorporation of telehealth to enable remote CR is feasible, acceptable and should be considered as an alternative CR delivery method.

Questionnaire responses (Zoom Orientation)

Questionnaire responses (Teleconsultation)

ABSTRACTS

E-Poster Presentation:

A41.

Transition to Remote Monitoring of Patients with Implanted Cardiac Devices: A Pilot Experience

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Introduction: Clinical evidence showed that remote monitoring (RM) in the management of CIEDs is a safe, feasible and efficient solution.
Objectives: 1. Early identification of arrhythmias, clinical events to allow earlier intervention. 2. Early detection of lead malfunction and device failure to improve clinical outcome. 3. Replace unnecessary device clinic follow up to reduce doctors' workload.
Methodology: Eligible patients with permanent pacemakers (PPMs), implantable cardioverter defibrillators (ICDs), cardiac resynchronization therapy (CRT) devices, and implantable loop recorders (ILRs), who agreed to receive a monitoring system and allow the internet-based transmission of encrypted personal information were invited to join. After full coverage explanation by device-clinic nurse, a written consent was signed. Individualized alerts and scheduled transmission was set up according to the pre-approved protocol. The data would be transferred to the RM database automatically or initiated by patients according to different manufactures. The device-clinic nurse reviewed the alerts on every Monday. For the high-risk red alerts, email notifications would send to the clinic nurse & doctor in-charge for analysis and early intervention if required. According to patient's clinical status, clinic doctor would consider to replace clinic follow-up by remote follow-up alternately.

Result: From July 2018 to June 2020, total 92(69.2%) eligible patients were enrolled. The main reasons to refuse or dropped out including did not believe the RM technology, felt frustration to set up the transmitter at home or initiate the data transmission by self, lacking supported from family members, not allowed by proprietor or dissatisfaction with no reduction of clinic follow-up. Total 707 alerts were received and reviewed. Twenty-six (3.7%) alert notifications due to new onset or burden of arrhythmias including atrial fibrillation and ventricular tachycardia, lead problems, ICD shock, battery depletion or fluid congestion required early follow up or clinical admission for active intervention. Episodes of clinic follow-up diminished by 40% compared with conventional practice. Moreover, the risk of missing a clinical event requiring active intervention did not report.
Conclusion: It can be easily concluded that RM should be considered in all eligible device patients.

A42.

A Pilot Home-based Cardiac TeleRehabilitation Program

SH Chiu,[1] NY Chan,[1] R Fung,[1] KY Wu,[1] YC Kwok,[1] S Ip,[1] I Wong,[1] J Chau,[1] R Law,[1] A Ngan,[1] F Wong,[2] J Chow[2]
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Introduction: Tele-cardiac rehabilitation has demonstrated safety and efficacy in several clinical studies. With the outbreak of COVID-19, the centered-based CR service was totally suspended. To facilitate patients to exercise at home while being monitored. A pilot home-based cardiac tele-rehabilitation program was developed with a structured protocol at Princess Margaret Hospital (PMH) and rolled out from October 2020.
Objectives: 1. To minimize the impact of suspension of in-hospital CR service due to outbreak of COVID-19. 2. To evaluate the effects and develop a home-based CR program for remote rehabilitation, based on advanced technological infrastructure and complementary clinical protocols.
Methodology:
Target patients: Low risk cardiac patients who fulfil the intake criteria, able and willing to use digital monitoring devices including blood pressure machine, smart watch and smart phone.
Program design: The program will last for 12 weeks and consists of education, exercise training and relaxation training. Each consenting patient will be given a training kit containing a training log-book, informative educational leaflets and a set of QR codes to access our home-made education, exercise training &

relaxation practice videos. Individual phone consultation by multidisciplinary will be scheduled once a week at the first five weeks. Patients can view the video at their own convenience, and then discuss or ask questions during phone follow-up. Individualized exercise will be prescribed according to patients' age, mobility and cardio fitness level. Patients can follow the designated video to do exercise at home. They will be instructed to measure and record their blood pressure, heart rate, and rate perceived exertion (RPE) before and after exercise. Physiotherapist will phone call patient to monitor and coach patients.
Evaluation: All patients will undergo a detailed face-to-face assessment at baseline and at 12-week. They are including 6-minute walk test, body mass index (BMI), waist circumference, blood test for lipid profile, etc. In addition, patients will also request to fill in a set of questionnaires to measure the physical activity level, functional performance and psychological fitness.
Conclusion: It believes that tele-rehabilitation is a more cost-effective model compared to center-based CR. It enables a new direction for the CR program.

ABSTRACTS

E-Poster Presentation:

A43.

International Classification of Functioning, Disability and Health (ICF) Framework of Pre and Post Surgery on Valve Replacement (Two Case Report)

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Objective: ICF classification on heart valve replacement were not familiar, although it already made by WHO since 2001 for measuring health and disability at both individual and population level. It assess into four domain: body function-structure, activity-participation and environmental factors that help patient get their previous activity before disease also support the cardiac rehabilitation program.

Methods: Reporting two case of valvular heart disease before and after valve replacement. First case is male, 33 years old with severe mitral regurgitation and stenosis; aorta regurgitation, moderate pulmonal hypertension. He was underwent mitral-aorta valve replacement and tricuspid anoplasty ring. ICF Classification: body function: heart function, body structure: structure of cardiovascular system-the trunk, activities limitation: lifting and carrying object; walking; driving, participation restriction: work and employment, environmental factor: physical geography. Before and after surgery, underwent cardiac rehabilitation until phase 2. Second case is male, 53 years old with Patent Ductus Arteriosus L to R shunt, severe Aorta regurgitation-stenosis, moderate mitral regurgitation, chronic kidney disease stage 3. He was underwent PDA ligation, aortic valve replacement. ICF classification: body function: heart function, body structure: structure of cardiovascular system; urinary system; the trunk, activities limitation: lifting and carrying object; walking; driving, participation restriction: work and employment, environmental factor: physical geography. Before and after surgery underwent cardiac rehabilitation until phase 2.

Result: First patient could return to previous work six months after surgery and cardiac rehabilitation. The second case achieved previous physical activity seven months after surgery and cardiac rehabilitation, but changed from driver to selling goods at home.

Conclusion: Framework of ICF help the patient and the medical service detailing the functional problem and it support the cardiac rehabilitation purpose to make the patient got the previous activity or modified it due to their health condition.

A46.

Barriers and Enablers to Cardiac Rehabilitation Services for Patients in Rural Areas

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Objectives: The importance of cardiac rehabilitation (CR) has been well-established in clinical guidelines for cardiac disease patients. However, it is widely under-utilized and on average, rural patients attend significantly fewer CR compared to their urban counterparts. This study aimed to examine the barriers and enablers to partaking in CR in this under-represented population.

Methods: We searched the PubMed, Google Scholar, and medRxiv databases to identify studies reporting information on factors that influence participation in hospital- and home-based CR for rural patients.

Results: A total of 16 articles met our inclusion criteria. For hospital-based CR, physician barriers included low-referral rates and rural healthcare workers' lack of knowledge about CR; patient barriers included female gender, non-Caucasian race, low socioeconomic status, lack of perceived need, and poor physical health; and systemic barriers included distance, transportation problems, travel costs, and lack of insurance coverage. Enablers for hospital-based CR included easy access to transport, family support, work flexibility, and program times. As for home-based CR, physician barriers included reliance on manual procedures; patient barriers included discomfort with new technology and forgoing travel reimbursement; and systemic barriers included procuring the necessary technology, recruiting rehabilitation professionals to nearby rural clinics, and coordinating services for an interdisciplinary approach. Enablers for home-based CR included availability of caregivers for technical assistance, proximity of an urban care center, and the use of technology already embedded in daily life.

Conclusion: Important differences in barriers and enablers exist between hospital- and home-based CR for rural patients. More efforts are needed to address and reflect these differences when implementing CR services in rural and remote areas.

ABSTRACTS

E-Poster Presentation:

A47.

Effects of 5:2 Intermittent Energy Restriction versus Continuous Energy Restriction on Cardiometabolic Health: A Systematic Review and Meta-Analysis of Randomized Controlled Trial

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Objectives: Intermittent Energy Restriction (IER) diet has increased in popularity recently. One of the most common forms of IER is 5:2 diet. We aim to summarize the most recent evidence on the efficacy of 5:2 IER diet versus continuous energy restriction (CER) on cardiometabolic health.

Methods: We systematically searched for randomized controlled trial (RCT) about 5:2 IER compared to continuous energy restriction from PubMed, EBSCO, and Scopus up to September 2020. The inclusion criteria were RCT, minimal duration of intervention ≥12 weeks, and age ≥18 years. The exclusion criteria were patients with eating disorder, critically ill, history of bariatric surgery, and doing other diet and exercise interventions. Mean difference was calculated with 95% confidence interval (CI) while heterogeneity was assessed using the I2 statistics. The primary outcomes were weight loss, blood pressure, fasting glucose, and HbA1c. Data from eligible studies were pooled for effect estimates. Statistical analysis was performed using Review Manager software. Meta-statistics were done using the random-effect model.

Results: We selected eight eligible RCT studies for analysis. IER with 5:2 diet compared to CER may reduce body weight (weighted mean difference [WMD]: 1.24 kg, 95% CI 2.3-0.18, I2: 90%). Both of 5:2 IER and CER have similar effects on fasting glucose (WMD: 0.89 mmol/L, 95% CI -0.6-2.38, I2: 98%), HbA1c (WMD: 0.07%, 95% CI -0.21-0.34, I2: 81%), systolic blood pressure (WMD: 2.44 mmHg, 95% CI -3.53-8.42; I2: 0%), and diastolic blood pressure (WMD: 1.79 mmHg, 95% CI -2.86-6.43; I2: 0%). Some high heterogeneity in the analysis were attributed to the different follow-up periods and high dropout rate used in the pooled studies.

Conclusion: IER with 5:2 diet is as effective as CER for cardiometabolic health. Future studies with high quality RCT are needed to confirm this result.

A48.

CCare – A Novel Model of Inpatient Cardiac Rehabilitation Program for Heart Failure Patients

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Cardiac rehabilitation (CR) improves clinical outcomes and quality of life in patients with heart failure (HF). Also, palliative care remain underutilized in HF patients.

This study aims to investigate the feasibility of a novel CR program combined with HF self-management techniques and early palliative intervention in a subacute inpatient setting.

A pragmatic non-blinded feasibility trial conducted in Singapore from Nov 2019 to Sep 2020. Inclusion criteria cover patients admitted to a tertiary hospital (Tan Tock Seng Hospital, TTSH) for acute decompensated heart failure with potential for improvement in cardiovascular or functional mobility. A novel holistic CR program (CCare) was designed and executed by a multi-disciplinary team comprising of a cardiologist, palliative doctor, rehabilitation doctor, nurse and physiotherapist. CCare consisted of individualised cardiovascular training, disease self-management techniques such as daily weight checking with fluid restriction, aggressive up titration of HF medications as well as early access to palliative care. Eligible patients identified in TTSH were sent to a sub-acute setting (Renci Community Hospital) for rehabilitation. Measures to assess feasibility include recruitment and completion rates. Program evaluation includes fidelity and adherence checks.

A total of 11 patients were recruited for CCare. Cardiovascular training consist of mainly ambulation was carried out in all patients. Exercise intensity was low with duration up to 20 minutes and patient education on fluid restriction and weight measurement were not consistent. The average length of stay was 2 weeks with daily exercise therapy. 80 percent of the patients completed their rehabilitation. Reasons for non-completion included unwillingness to stay inpatient, low intensity exercise that was not motivating. All patients showed improvement in either functional mobility or walking tolerance.

CCare is a feasible inpatient sub-acute care model with clinical benefits. Challenges include deviation from training protocol with inadequate intensity and time, and also lack of focus on patient education. Patient adherence to rehabilitation has to be considered prior to recruitment.

A recent addition of a weekly face-to-face multidisciplinary team round for clinical optimization of the patient and further training of subacute staff for optimal exercise training and HF management are in place to improve CCare.

ABSTRACTS

E-Poster Presentation:

A49.

Novel Coronavirus Infection and Its Effects on Heart

L Hakemi

Iran Noc, Tehran; Sports Medicine Federation of Iran; Shefa Neuroscience Research Center, Iran

Objectives: To have a comprehensive review on effects of novel coronavirus on heart.
Methods: review article.
Results: The novel coronavirus may affect cardiac tissue via three main mechanisms: 1- direct myocardial injury and myocarditis caused by the virus, 2- hyper-inflammation and immunopathology, and 3- respiratory failure, acute respiratory distress syndrome, and effects of hypoxemia on cardiac tissue. In a large number of patients, all three mechanisms are involved. Hypercoagulability is a mechanism for coronary artery stenosis and acute coronary syndrome or myocardial infarction. Also, blood pressure abnormalities, either hypertension or hypotension are frequent in severely ill patients. A high proportion of critically ill patients develop arrhythmias. Arrhythmias may arise due to hypoxemia, metabolic derangements, systemic inflammation, or myocarditis. In a postmortem study, real-time polymerase chain reaction analyses on heart tissue detected the viral genome in nearly one third of patients. Interleukin-6, serum ferritin, brain natriuretic peptide, and high sensitivity cardiac troponin are among the various biomarkers elevated during the course of the disease. It has been shown that as the disease severity increases and in the 3rd stage of the disease- host response- inflammatory and cardiac markers show elevations. Cardiac involvement ad elevated cardiac biomarkers are prominent features in COVID-19 and associated with a worse prognosis and increased mortality. In a survey in Wuhan, 40% of deaths were attributed to myocardial damage or heart failure, alone or in combination with respiratory failure. In autopsies, mononuclear infiltrates of macrophages and CD4+ T cells have been shown in areas of cardiac necrosis. It has been proposed that acute cardiac involvement is a stronger risk factor for increased mortality than age, diabetes mellitus, chronic pulmonary disease, or even history of cardiovascular disease. Since the virus is new- emerging, we do not know much about its long term consequences. So, its effects on heart in the convalescent and chronic phases are not well-known. Delayed myocarditis, cardiac arrest, hyperlipidemia and pulmonary fibrosis are possible long term consequences of the disease.
Conclusion: We have to be aware of cardiac consequences of COVID-19 to manage the disease optimally.

A50.

Return to Exercise after COVID-19 Disease

L Hakemi

Iran Noc, Tehran; Sports Medicine Federation of Iran; Shefa Neuroscience Research Center, Iran

Objectives: Physical activity is one of most important parts of a healthy life style. After COVID-19 we have to consider alterations needed in prescribing exercise.
Methods: A comprehensive review.
Results: The guidelines for returning to exercise should consider elite athletes as well as the general population in two different categories.
We may also classify the patients to these categories:
1. Those who were not affected by COVID-19 or were completely asymptomatic and were home- quarantined; this group will suffer from deconditioning. They have to begin milder physical activity and reduced duration compared to the previous active days before quarantine. The increase in volume and severity of exercises are based on the general condition and the patient's tolerance. All major changes should be monitored by a medical profession expert.
2. Those who were affected by mild to moderate COVID-19 and were not hospitalized; this group will suffer from decreased cardio-respiratory fitness as well as deconditioning. They have to begin with semi-monitored activities. Oxygen saturation should be monitored during physical activity and supplemental oxygen may improve tolerance and safety.
3. Those who were affected by severe COVID-19 and were hospitalized; this group will suffer from severe generalized muscle wasting and decreased cardio-respiratory fitness. They have to begin with in-patient rehabilitation.

All participants have to pay attention to social/physical distancing and good hygienic measures, proper warm-up/cool down, adequate hydration, and appropriate dietary regimen.Many affected patients may need protein supplements to counteract severe muscle wasting; anti-oxidant and vitamin-mineral supplements may be helpful because of long term decreased intake during hospitalization (low appetite, intensive care measures, and gastrointestinal symptoms). Psychological consultation to manage post-traumatic stress disorder, anxiety, depression, obsessive symptoms should not be neglected.

ABSTRACTS

E-Poster Presentation:

A51.

Effect of Physical Activity and Smoking in Patients with Peripheral Arterial Disease: A Nationwide Cohort Study

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Objectives: To investigate effects of physical activity (PA) and smoking on adverse outcomes in patients with peripheral arterial disease (PAD) after revascularization therapy.

Methods: This retrospective cohort study was conducted using the Korean National Health Insurance Service (NHIS) database. Subjects who had revascularization therapy with PAD from 2010 to 2015 were included. They were categorized as active and inactive according to PA, or current smoker and non-smoker according to smoking status. Clinical outcomes including all-cause mortality, myocardial infarction, stroke, amputation, and reintervention were analysed. Major adverse outcome was defined as a composite of all-cause mortality, myocardial infarction, and stroke, while major adverse limb event (MALE) was defined as a composite of amputation and reintervention.

Results: A total of 8324 subjects were included in the analysis. Mean age was 64.7 years and 76.9% were male. Among them, 32.7% were inactive and 26.4% were smokers after receiving revascularization therapy (Table 1). Active group showed 23.6% lower mortality, 20.6% lower major adverse outcome, and 14.4% lower MALE. On the other hand, smoker group showed 27.7% higher mortality, 26.0% higher major adverse outcome, and 30.2% higher MALE (Table 2 and Figure).
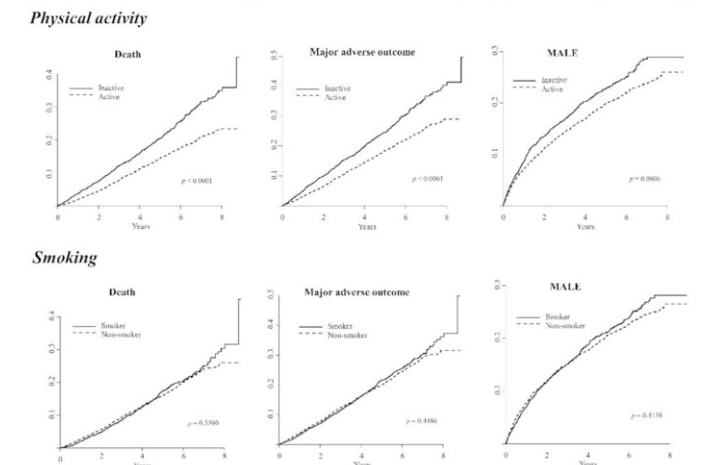
Conclusions: Even after receiving revascularization therapy for PAD, a significant portion of patients were inactive and smoked, which had an adverse effect on clinical outcomes. Thus, systematic efforts, such as comprehensive rehabilitation program would be necessary in patients with PAD.

Table 2. Hazard ratios of outcomes according to PA & smoking.

> *Physical activity*

	Type	Event	Person-Years	Crude HR	P	Adjusted† HR	p	Fully Adjusted ‡ HR	p
Death	Active (n = 5603)	773	25349.64	0.643 (0.577 – 0.716)	<.0001*	0.700 (0.627 – 0.780)	<.0001*	0.764 (0.684 – 0.853)	<.0001*
	Inactive (n = 2721)	565	11940.55	Reference		Reference		Reference	
Major Adverse Outcome	Active (n = 5603)	991	24724.07	0.684 (0.620 – 0.754)	<.0001*	0.740 (0.670 – 0.816)	<.0001*	0.794 (0.719 – 0.877)	<.0001*
	Inactive (n = 2721)	677	11582.18	Reference		Reference		Reference	
MALE	Active (n = 5603)	1010	22382.72	0.835 (0.753 – 0.926)	0.0006*	0.831 (0.749 0.921)	0.0005*	0.856 (0.771 – 0.951)	0.0037*
	Inactive (n = 2721)	563	10311.22	Reference		Reference		Reference	

> *Smoking*

	Type	Event	Person-Years	Crude HR	p	Adjusted HR†	p	Fully Adjusted HR‡	p
Death	Smoker (n = 2193)	365	9892.25	1.037 (0.919 – 1.169)	0.5557	1.126 (0.994 – 1.276)	0.0616	1.277 (1.122 – 1.454)	0.0002*
	Non-smoker (n = 6131)	973	27397.94	Reference		Reference		Reference	
Major Adverse Outcome	Smoker (n = 2193)	456	9615.73	1.043 (0.936 – 1.161)	0.4443	1.138 (1.017 – 1.273)	0.0239*	1.260 (1.123 – 1.415)	<.0001*
	Non-smoker (n = 6131)	1212	26690.52	Reference		Reference		Reference	
MALE	Smoker (n = 2193)	431	8654.81	1.048 (0.938 – 1.171)	0.4089	1.052 (0.937 1.182)	0.3923	1.302 (1.152 1.470)	<.0001*
	Non-smoker (n = 6131)	1142	24039.13	Reference		Reference		Reference	

HR = hazard ratio; MALE = major adverse limb event.
*Statistically significant
†Adjusted for age and sex
‡Adjusted for age, sex, region, income, alcohol, body mass index, hypertension, diabetes mellitus, dyslipidemia, end stage renal disease, fasting blood glucose level, low-density lipoprotein level, waist circumference, and days from revascularization to health check-up.

Table 1. Demographics

	Total (n = 8324)	Inactive (n = 2721)	Active (n = 5603)	p
Age, year ± SD	64.71 ± 10.46	65.91 ± 10.4	64.12 ± 10.44	<.0001
Gender (male), n(%)	6403 (76.92)	1988 (73.06)	4415 (78.8)	<.0001
Revascularization, n(%)				0.0473
Open bypass	987 (11.86)	353 (12.97)	634 (11.32)	
Endovascular	7078 (85.03)	2276 (83.65)	4802 (85.7)	
Both	259 (3.11)	92 (3.38)	167 (2.98)	
Income, n(%)				<.0001
Medicaid	483 (5.8)	181 (6.65)	302 (5.39)	
Q1 (lowest)	1412 (16.96)	499 (18.34)	913 (16.29)	
Q2	1336 (16.05)	469 (17.24)	867 (15.47)	
Q3	2094 (25.16)	703 (25.84)	1391 (24.83)	
Q4 (highest)	2999 (36.03)	869 (31.94)	2130 (38.02)	
Rural residence, n(%)	4940 (59.35)	1794 (65.93)	3146 (56.15)	<.0001
Past medical history, n(%)				
End stage renal disease	1056 (12.69)	386 (14.19)	670 (11.96)	0.0042
Diabetes mellitus	3183 (38.24)	1026 (37.71)	2157 (38.5)	0.4863
Hypertension	5808 (69.77)	1923 (70.67)	3885 (69.34)	0.2136
Dyslipidemia	5260 (63.19)	1679 (61.71)	3581 (63.91)	0.0502
Waist circumference, n (%)				<.0001
< 90 (male), 80 (female)	5556 (66.75)	1730 (63.58)	3826 (68.28)	
90 (male), 80 (female) <	2768 (33.25)	991 (36.42)	1777 (31.72)	
Charlson Comorbidity Index, n (%)				0.7075
0	317 (3.81)	98 (3.6)	219 (3.91)	
1	969 (11.64)	311 (11.43)	658 (11.74)	
2 or more	7038 (84.55)	2312 (84.97)	4726 (84.35)	
Fasting plasma glucose, mg/dL., n (%)				0.2105
< 126	6674 (80.18)	2203 (80.96)	4471 (79.8)	
126 ≤	1650 (19.82)	518 (19.04)	1132 (20.2)	
Low-density lipoprotein, mg/dL, n (%)				0.1344
< 70	2222 (26.69)	698 (25.65)	1524 (27.2)	
70 ≤	6102 (73.31)	2023 (74.35)	4079 (72.8)	
Smoking, n(%)				0.0014
Non-smoker	6131 (73.65)	1944 (71.44)	4187 (74.73)	
Smoker	2193 (26.35)	777 (28.56)	1416 (25.27)	
Alcohol, n(%)				<.0001
Non- drinker	5831 (70.05)	2032 (74.68)	3799 (67.8)	
Mild drinker (≤30)	2119 (25.46)	554 (20.36)	1565 (27.93)	
Heavy drinker (30 < g/day)	374 (4.49)	135 (4.96)	239 (4.27)	
Length of hospital stay	9.14 ± 9.21	9.59 ± 9.81	8.91 ± 8.89	0.0016
Days from revascularization to health check-up	341.31 ± 196.6	343.49 ± 197.27	340.25 ± 196.28	0.4809

Figure. Survival curves according of clinical outcome according to physical activity & smoking

Physical activity

Smoking

ABSTRACTS

E-Poster Presentation:

A52.

Building Capacity in Cardiac Rehabilitation Through the International Council of Cardiovascular Prevention and Rehabilitation's Cardiovascular Rehabilitation Foundations Certification (CRFC) Program: Evaluation of Reach, Barriers and Impact

FA Heald,[1] AS Babu,[2] A Contractor,[3] GLM Ghisi,[4] JP Buckley,[5] A Atrey,[6] F Lopez-Jimenez,[7] SL Grace[1,8]

[1]Faculty of Health, York University, Toronto, Canada; [2]Department of Physiotherapy, Manipal Academy of Higher Education, Manipal, India; [3]Sir H. N. Reliance Foundation Hospital and Research Centre, Mumbai, India; [4]Toronto Rehabilitation Institute, University Health Network, Toronto, Canada; [5]Institute of Medicine, University Centre Shrewsbury, Shrewsbury, England, United Kingdom; [6]Independent Researcher, Toronto, Canada; [7]Department of Cardiovascular Medicine, Mayo Clinic, Rochester, United States; [8]KITE & Peter Munk Cardiac Centre, University Health Network, Toronto, Canada

Objectives: The Cardiovascular Rehab Foundations Certification (CRFC; https://globalcardiacrehab.com/Certification) program was developed to facilitate implementation of ICCPR's consensus statement on CR delivery in low-resource settings, with focus on how to feasibly and affordably deliver each core CR component. This evaluation describes the reach of the CRFC, barriers to its completion, as well as satisfaction and impact of the course among those completing it.

Methods: An online survey was developed for individuals who completed the CRFC (completers), and for those who applied but did not complete the program (non-completers). The confidential surveys comprised characteristics of learners, and evaluation items with 5-point Likert scales and open-ended responses, administered using Google forms in English.

Results: With regard to reach, there have been 198 applicants from 23/203 (11.3%) countries; 27 (13.6%) applicants were from lower-middle income countries (LMICs). Responses were received from 37/108 completers (25 [67.6%] female; response rate 34.3%) and 16/73 non-completers (11 [68.8%] female; response rate 21.9%). Among completers, 6 (16.2%) were from LMICs; 20 (54.1%) worked in healthcare. Overall satisfaction with the CRFC was high (4.49±0.51/5); most completers would highly recommend the CRFC to others (4.30±0.66), and perceived that the information provided will contribute to their work and/or the care of their patients (4.38±0.89); 29 (78.4%) had used the information from the CRFC in their practice. Among non-completers, 8 (50.0%) were from LMICs; 15 (93.8%) worked in healthcare. Barriers were related to time constraints, cost, and technical glitches.

Conclusion: The CRFC is meeting overall expectations of the learners, and its impacts on CR practice are encouraging. The reach of the CRFC still needs to be broadened, in particular in low-resource settings. Input has been implemented to improve the CRFC.

A53.

Dosing Time-dependent Effect of Antihypertensive Drugs in Blood Pressure and Major Cardiovascular Events: A Meta-Analysis

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Objectives: The central pacemaker located in suprachiasmatic nucleus, also known as circardian system, controls how our body regulates. Blood pressure (BP) is in compliance with circardian variation under the regulation of the sleep-wake cycle. We hypothesize we can improve the benefit of antihypertensive treatment simply by timing the administration, commonly referred as chronotherapy. This study aims to obtain effects of chronotherapy in antihypertensive treatment particularly in clinical examination and outcome.

Methods: A comprehensive literature search was performed on four databases (Medline, Scopus, Embase, Cochrane) of primary studies containing randomized controlled trials (RCT) published for the last ten years. The available full texts were scanned for potentially relevant articles that fulfilled the inclusion criteria. The Cochrane risk-of-bias tool appraised the included RCTs. We compared final characteristics of bedtime dosing as treatment arm and awakening dosing as control arm. Standardized mean difference (SMD), hazard ratio (HR), and relative risk (RR) were computed for overall estimated effect.

Results: A total of 24,028 participants from four RCTs were included in the analysis. The overall estimated effect showed a significant reduction in 48-hour systolic blood pressure (SBP) (SMD=0.111, 95% CI 0.086-0.136, P<0.001), clinic SBP (SMD=0.145, 95% CI 0.120-0.171, P<0.001), non dipper prevalence with Mantel-Haenszel pooled RR of 0.706 (95% CI 0.686-0.727, P<0.001). Major adverse cardiovascular events (MACE) reduced insignificantly (HR=0.798; 95% CI, 0.511 to 1.084).

Conclusion: Several final characteristics were affected by chronotherapy. However, cardiovascular morbidity and mortality are insignificantly impacted. Further studies are required to provide means of individualization for each patient to this inexpensive approach.

ABSTRACTS

E-Poster Presentation:

A56.

Recent Developments and Outcomes in Mobile Health Interventions for Cardiovascular Health Promotion

J Moon,[1] H Moon[2]

[1]Sungju Moogang Hospital, Sungju; [2]Yonsei University Severance Hospital, Seoul, South Korea

Objectives: There is emerging evidence supporting the efficacy of mobile health (mHealth) in promoting self-management, reducing the risk of COVID-19 exposure, and improving the delivery of care. The aim of this study was to review recent studies on mHealth interventions for cardiovascular health.

Methods: We searched the PubMed, Google Scholar, and medRxiv databases to identify studies published since January 1, 2020 reporting information on mHealth interventions for cardiovascular risk management and health promotion.

Results: A total of 10 eligible studies with 2,418 participants met our inclusion criteria and were included in this review. As opposed to past studies on mHealth interventions which included simple text messages and voice calls, studies published in 2020 were entirely focused on mobile applications and tablet computers. Results showed that increased number of and ease of access to health recommendations via mHealth technologies result in greater health-seeking behaviors including medication adherence, dietary intake, and physical exercise time. There was also a statistically significant increase in self-confidence in managing one's health (p<0.05). A vast majority of studies reported improvement in health outcomes among the intervention groups, but similar improvements were also observed in the control group. Overall, most studies found no significant differences between intervention and control groups with regards to health parameters.

Conclusion: The demand for mHealth is growing, but there is limited evidence to support its efficacy when compared to traditional health interventions. Results from ongoing projects such as TeleCheck-AF in Europe and MECA Study in the U.S. are needed to clarify the impact of mHealth interventions. Further advancements in technology and diversifying the mode of delivery will help establish the role of mHealth for wider use in cardiovascular health promotion.

A57.

Change of Exercise Capacity on the Patients with Cardiovascular Disease after the COVID19 Pandemic

K Iwata

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Background: When the COVID19 pandemic had begun, lowering physical function had been predicted. In fact, many patients with cardiovascular disease had been staying home for long time. This study aimed to clarify a change of exercise capacity of patients with cardiovascular disease after the COVID19 pandemic.

Methods: We retrospectively evaluated peak O2 uptake (VO2) and Anaerobic threshold (AT) of 23 cardiovascular patients who underwent cardiopulmonary exercise test (CPX) in our hospital for follow-up after outpatient cardiac rehabilitation both between July and September in 2020 (after the COVID19 pandemic) and between December in 2019 and April in 2020 (before the COVID19 pandemic). And of them, 13 patients had undergone CPX also between July and September in 2019. We evaluated their exercise capacity to consider a seasonal effect of summer.

Results: Peak VO2 after the COVID19 pandemic was significantly lower and decreased by 20% in a short term (20.6 ml/kg/min [±7.75] vs 17.17 ml/kg/min [±6.79]; p<0.001). AT was also the same result (12.9 ml/kg/min [±3.34] vs 10.96 ml/kg/min [±2.78]; p<0.001). In regard to comparison with exercise capacity 1 year ago, both peak VO2 (19.28 ml/kg/min [±7.45] vs 17.22 ml/kg/min [±7.15]; p=0.003) and AT (19.28 ml/kg/min [±7.45] vs 17.22 ml/kg/min [±7.15]; p=0.003) after the COVID19 pandemic were significantly lower. Despite the same season, exercise capacity had decreased after the COVD19 pandemic.

Conclusion: After the COVID19 pandemic, exercise capacity of patients with cardiovascular disease had been falling. There is a possibility that it will be important problem in new-normal life.

ABSTRACTS

E-Poster Presentation:

A59.

Analysis of Web Information on Exercise for Cardiovascular Health Promotion

H Moon,[1] J Moon[2]
[1]Yonsei University Severance Hospital, Seoul; [2]Sungju Moogang Hospital, Sungju, South Korea

Objectives: Professional organizations including the American Heart Association provide specific guidelines regarding exercise and list warning signs during exercise that signal a visit to the hospital. With increasing number of patients using the Internet for healthcare advice, it is important to assess the quality of online data on exercise.

Methods: Two independent investigators queried the lay terms "exercise for heart diseases" on Google search engine. The first 100 websites were analyzed, but those that were inaccessible or irrelevant to heart diseases or exercise were excluded. They were categorized as informational websites (IW) or professional websites (PW) depending on their association. We reviewed them for the definition of regular exercise and associated precautions for warning signs. Reading quality was assessed using Flesch-Kincaid Grade Level (FKGL) and Flesch Reading Ease Score (FRES). Statistical analyses were performed using chi-squared test and two-sample t-test with a significance value of $p < 0.05$.

Results: A total of 84 websites (39 IW, 45 PW) met our inclusion criteria. IW provided specific guideline for regular exercise more often than PW, but these differences were not statistically significant (71.8% and 62.2%, respectively with $p=0.35$); the same was observed with precautions for warning signs (51.3% and 46.7%, respectively with $p=0.67$). IW and PW had similar FKGL (10.35 and 11.4, respectively with $p=0.1687$), but IW had a significantly higher FRES of 49.1% compared to 40.8% for PW ($p=0.0044$).

Conclusion: No significant difference was observed between IW and PW in the frequency of providing specific guidelines for exercise and associated precautions. As the National Institutes of Health recommends 6th grade reading level for patient materials, this study shows that healthcare centers should improve the readability of their online data.

A60.

The Effectiveness of Basic Life Support Training in High School Students': A Non-randomized Quasi-experimental Study

A Zahra,[1] Y Baidowi,[1] W Widyanti,[1] R Maharani,[1] H Khairunnisa[2]
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Objectives: Immediate cardiopulmonary resuscitation (CPR) is necessary in improving the survival rate in sudden cardiopulmonary collapse. The provision of bystander CPR is known to be a critical determinant of survival from Out Hospital Cardiac Arrest (OHCA). This study aimed to assess the basic life support (BLS) knowledge and performance of high school students, before and after CPR-training.

Method: A non-randomized quasi-experimental design (One group pre-test-post-test) was used in this study. The convenience sample of 45 high school first aid student clubs (mean age 16.1±1.7 years) in a remote area located at Gondanglegi, Malang, East Java, Indonesia. They completed a two-hours training course that provided a theoritical background on sudden cardiac death (SCD) and a hands-on CPR tutorial. They were asked to do BLS on a manikin to simulate a cardiac arrest scenario during the training. At the end of the session, participants completed a self-assessment questionnaire to evaluate their comprehension of the training. The pre- and post-assessment practice scores were compared using a paired T-test analysis.

Results: After basic life support training, level of knowledge and practical skill scores were higher compared to pre-training scores (t=-19,5, p=0.000; t=-10,3, p=0.000). The mean pre-test score was ±60,58 and ±75,53 for the post-test score.

Conclusion: The study demonstrated that basic life support training improved knowledge and skill both in practical and theoretical among high school students. Increasing the number of trained students may minimize the reluctance to conduct bystander CPR and increase the number of positive outcomes after a sudden cardiopulmonary collapse.

ABSTRACTS

E-Poster Presentation:

A61.

Impact of Subacute Inpatient Cardiac Rehabilitation on Functional Capacity After Heart Valve Replacement

V Grinberga,[1,2] D Stirane,[1,2] A Nulle,[1] I Sviklina[1]

[1]National Rehabilitation Centre "Vaivari", Jurmala; [2]Riga Stradins University, Riga, Latvia

Objectives: Find out the impact of a specialized cardiac rehabilitation program on functional capacity by using six-minute walk distance test for patients after heart valve replacement.

Methods: This descriptive epidemiological study was performed on 50 patients after heart valve replacement referred for a cardiac rehabilitation. Data on patient age, body mass index (BMI), co-morbidities, use of medications and six-minute walk test (6MWT) were evaluated. Data were analyzed by SPSS software, and the significance level was considered as $p<0.05$.

Results: Participants' ages ranged from 36 to 85 years (M=64.1, SD=10.78) with 60% identified as female, 64% married or partnered, 46% reported being retired or not working, 42% had higher education. Study participants BMI ranged from 19 to 38 (M=28.1, SD=4,4). The participants afrer heart valve replacement (n=32 aortic valve, n=9 mitral valve, n=1 tricuspid valve, n=8 both, aortic and mitral valve) reported the diagnosis of an average of 2.63 (±2.01) chronic health conditions, with 50% reported having three or more chronic health conditions. Study particpants participated in 2-week inpatient cardiac rehabilitation programm (an averege 14 days (SD=0.42)). The average distance in 6MWT at the begining of cardiac rehabilitation was 411m and after cardiac rehabilitation - 466 m. The mean difference in 6MWT results before and after cardiac rehabilitation was 55.34 m (95%: 30.70-63.14) assessed as statistically significant (p<0.001). As the patient's age increases, the difference in walked distance before and after the rehabilitation course decreases. There is a negative, weak and statistically significant correlation between study participants age and distance increase (r=-0.21; p=0.03).

Conclusions: The participation in the cardiac rehabilitation program greatly affects the improvement of functional capacity for patients undergoing heart valve replacement. Functional capacity increases more in younger persons after heart valve replacement than in older persons. The improvement of functional capacity is not related to the patient's after heart valve replacement functional condition at the begining cardiac rehabilitation.

ABSTRACTS

E-Poster Presentation:

A62.

Patterns of Clinical Management Among Young Hypertensives (18-40 years) in India: A Retrospective EMR based Observational Study (Report of Baseline Data)

MY Khan,[1] S Sharma,[1] J Dalal,[2] U Khanna,[3] K Gaurav,[1] S Pandit,[1] A Tandayam,[1] S Shah[4]

[1]Dr. Reddy's Laboratories Ltd., Ameerpet, Hyderabad; [2]Kokilaben Dhirubhai Ambani Hospital and Medical Research Center, Mumbai; [3]Kidney associates, Lancelot Kidney and GI Centre, Mumbai; [4]Healthplix Pvt Ltd., Bengaluru, India

Objective: Hypertension is one of the major cardiovascular risk factors worldwide. An increasing trend has been observed over past few decades among younger age group. The purpose of the study was to understand the current trends in the management of young hypertensives including choice of therapy according to the grades of hypertension.

Methods: Electronic medical record data of 100075 Indian adult patients who were ≥18 years and diagnosed with hypertension (≥140/90 mmHg) as per the ESC/ESH hypertension guideline (2018) was retrospectively analyzed (June 2017 - June 2019). Out of this, around 68685 patients were on oral antihypertensive therapy. Among these, 6381 young hypertensive cases (18-40 years) were observed. Treatment patterns were recorded for different grades of hypertension (Grade 1, 2 or 3) among young hypertensives and evaluated using simple descriptive statistics.
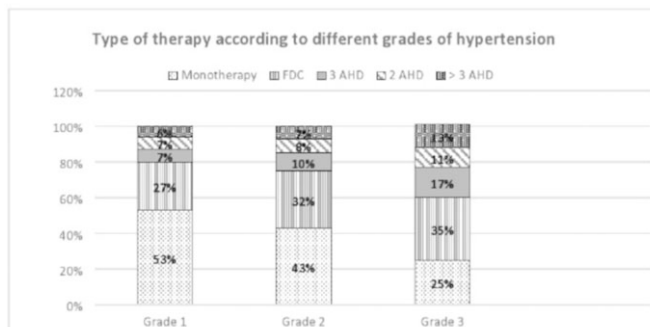
Results: Among all young Indian hypertensive patients, majority had grade 2 hypertension (43%) followed by grade 1 hypertension (38%) and grade 3 hypertension (19%). Majority of grade 1 and grade 2 patients were prescribed with monotherapy (53% and 43% respectively). ARBs was the preferred drug class and Telmisartan was the most commonly prescribed molecule across all grades. Fixed Dose combinations (FDCs) were the second most common prescribed therapy in both grade 1 or 2 patients (27% & 32% respectively) with ARB + Diuretics as most preferred class combination (23% and 32% respectively) and Chlorthalidone + Telmisartan as most preferred drug combination (35% and 44% respectively). Maximum grade 3 patients were prescribed with FDC (35%) with ARB plus CCB as most preferred class combination (30%) and Amlodipine + Telmisartan as most preferred drug combinations (63%).

Conclusion: This Study highlighted the increasing trend of Hypertension among young population in India where in majority were affected with grade 2 hypertension. This may result in high burden of cardiovascular morbidity and mortality and long term implications in young population in India. Therefore, emphasis should be on early screening, identification, diagnosis and management. Further long term and large scale studies need to be conducted to have a better understanding of the disease determinants and future benefits of controlling BP among young hypertensives.

Table 1: Showing % of patients treated with most common type of therapy, Drug class and molecules according to different grades of hypertension (Top two molecules and drug classes have been mentioned under each therapy).

S.N	Therapy			Grade 1	Grade 2	Grade 3
1	Monotherapy					
		ARB		40%	46%	32%
			Telmisartan	65%	64%	67%
			Olmesartan	18%	16%	15%
		Beta blocker		34%	28%	21%
			Propranolol	38%	33%	13%
			Metoprolol	38%	40%	51%
		CCBs		15%	19%	37%
			Amlodipine	48%	52%	42%
			Cilnidipine	31%	25%	27%
		Diuretics		6%	5%	5%
			Torsemide	33	39%	64%
			Spironolactone	30	16%	0
2	FDC					
		ARB + Diuretics		23%	32%	24%
			Chlorthalidone + Telmisartan	35%	44%	40%
			Hydrochlorothiazide + Telmisartan	33%	28%	25%
		ARB + CCB		17%	24%	30%
			Amlodipine + Telmisartan	56%	66%	63%
			Cilnidipine + Telmisartan	25%	17%	21%
3	Multiple AHDs (2 or more)					
		ARB + Beta blocker + CCB	Telmisartan + Metoprolol + Amlodipine	48%	23.6%	30%
		ARB + Beta blocker	Telmisartan + Metoprolol	36%	22.9%	-

Figure 1: Showing type of therapy prescribed in different grades of hypertension.

ABSTRACTS

E-Poster Presentation:

A63.

A Retrospective EMR Based Study to Evaluate Gender Differences in Patterns of Clinical Management of Hypertension in India: A Report of Baseline Data

MY Khan,[1] A Tandayam,[1] J Dalal,[2] U Khanna,[3] K Gaurav,[1] S Pandit,[1] S Sharma,[1] S Shah[4]

[1]Dr Reddy's Laboratories Ltd., Ameerpet, Hyderabad; [2]Kokilaben Dhirubhai Ambani Hospital and Medical Research Center, Mumbai; [3]Kidney Associates, Lancelot Kidney and GI Centre, Mumbai; [4]Healthplix Pvt Ltd., Bengaluru, India

Objective: Influence of gender in hypertension and its management is unclear. Prevalence, treatment and control of hypertension show some variation between the two genders. We conducted this study to find out whether there exists any gender differences in presentation of hypertension and drug utilization patterns of antihypertensive medications.

Methods: Electronic medical record data of 100075 Indian patients ≥18 years of age with hypertension (≥140/90 mmHg) as per the ESC/ESH guidelines (2018) was retrospectively analyzed (June 2017 - June 2019). 68684 hypertensives on anti-hypertensive medications were further classified according to gender and grades of hypertension. Each group was observed for treatment patterns and findings were evaluated using simple descriptive statistics.

Results: Among 68684 hypertensive patients, 35409 (51.55%) were males and rest females (48.5%). Among male grade 1 and grade 2 hypertensives, monotherapy was most commonly prescribed (grade 1 vs grade 2: 39% vs 33%) with ARBs being the most common class (grade 1 vs grade 2: 49% vs 51%) and Telmisartan (grade 1 vs grade 2: 63.4% vs 64.5%) most common molecule. In male grade 3 hypertensives, fixed dose combinations (FDCs) were most frequently prescribed (32%) with ARB + CCB being the preferred class (34%) and Amlodipine+Telmisartan preferred molecule. Among female grade 1 hypertensives, monotherapy and FDCs (33% each) were most commonly prescribed with ARBs being most commonly prescribed class in monotherapy (45%) and ARB + Diuretic being most preferred FDC. In females with grade 2 and grade 3 hypertension, FDCs were most commonly prescribed (grade 2 vs grade 3 – 34% vs 33%) with ARB + Diuretic (34%) and ARB + CCB (33%) being used most commonly in grade 2 and grade 3 patients respectively.

Conclusion: Our study revealed no gender difference in prevalence of hypertension. The one difference observed was FDC combinations being preferred in grade3 hypertension among males whereas they were preferred in both grade 2 and grade 3 hypertension among females. Irrespective of gender, strict lifestyle modifications and appropriate treatment with anti-hypertensive medications is very essential. Further large scale and long term studies are needed to evaluate the association of gender with hypertension.

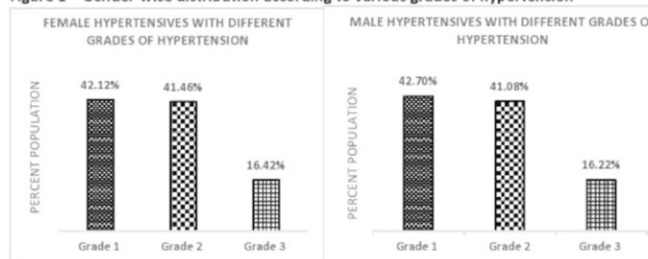Figure 1 – Gender-wise distribution according to various grades of hypertension

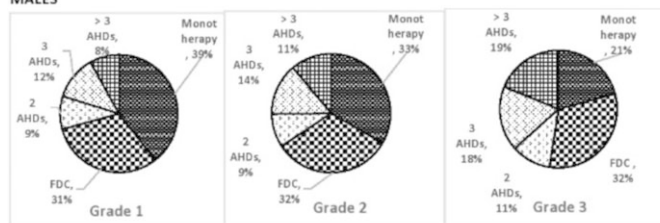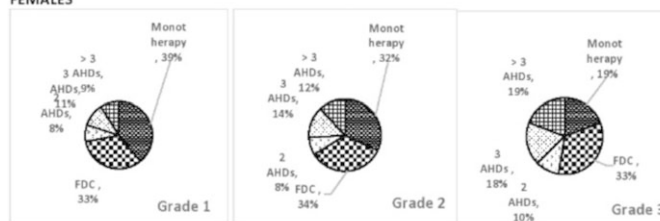Figure 2: Showing various drug classes prescribed across all grades of male hypertensives.

Figure 3: Showing various drug classes prescribed across all grades of female hypertensives

ABSTRACTS

E-Poster Presentation:

A64.

A Retrospective EMR Based Study to Evaluate Patterns in Management of Hypertension among Smokers in India: A Report of Baseline Data

MY Khan,[1] S Sharma,[1] J Dalal,[2] U Khanna,[3] K Gaurav,[1] S Pandit,[1] A Tandayam,[1] S Shah[4]

[1]Dr. Reddy's Laboratories Ltd., Ameerpet, Hyderabad; [2]Kokilaben Dhirubhai Ambani hospital and Medical Research Center, Mumbai; [3]Kidney associates, Lancelot Kidney and GI Centre, Mumbai; [4]Healthplix Pvt Ltd., Bengaluru, India

Smoking is known to cause direct endothelial damage and produces significant hemodynamic changes in both small and large arteries, and hence plays important role in pathophysiology of hypertension. This study was conducted to understand the presentation and drug utilization patterns among smokers in Indian hypertensive population.

Methods: Electronic medical record data of 100075 Indian adult patients who were ≥18 years and were diagnosed with hypertension (≥140/90 mmHg) as per the ESC/ESH hypertension guideline (2018) was retrospectively analysed (June 2017 - June 2019). Out of this, around 68685 patients were on oral antihypertensive therapy. Off these, 1969 patients had history of smoking. Treatment patterns were recorded for different grades of hypertension among smokers and evaluated using simple descriptive statistics.

Results: Among all the 1969 smokers, grade 1 hypertension (48%, Mean baseline BP- 146/91mmHg) was observed to be the most common presentation followed by grade 2 (40%, Mean BP- 160/96 mmHg) and grade 3 (12%, Mean BP- 180/104mmHg). Majority of grade 1 patients were prescribed with monotherapy (41%) followed by Fixed dose combination (FDC) therapy while both were equally prescribed in grade 2 patients (33% each). Among grade 3 patients, FDC (30%) was preferred over monotherapy (23%). ARBs was the most common drug class and Telmisartan was the most commonly prescribed molecule. ARB plus diuretics was found to be preferred class combination among grade 1 patients (28%) and Hydrochlorothiazide plus Telmisartan was most preferred drug combination. However, ARB plus CCB was most commonly used drug class combination among both grade 2 and 3 patients (34% & 33% respectively) and Amlodipine plus Telmisartan being most common used drug combination.

Conclusion: This study indicated correlation of hypertension among smokers in India. Mean baseline BP among smokers was found to be considerably high, which requires prompt management to prevent future CV events. Emphasis should be on good BP control and cessation of smoking to significantly improve outcomes among these patients. Further large scale and long term studies need to be carried out to evaluate the association of smoking and hypertension in Indian context and various treatment patterns to control BP in smokers.

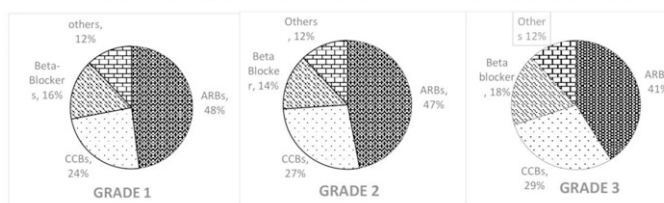Figure 1: Showing prescribing pattern of Monotherapy among all grades of hypertensive smokers

Figure 2: Showing different drug combinations prescribed across all grades of hypertensive smokers
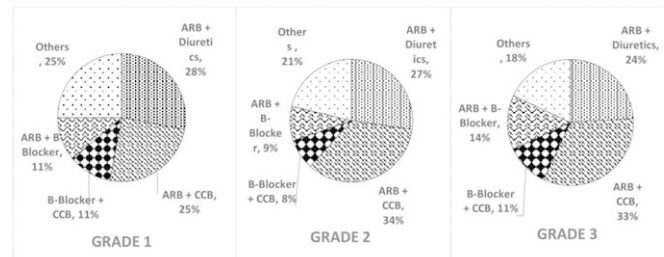
Table 1: Depicts most common molecules prescribed under different drug classes across all grades of hypertension

	Monotherapy			FDCs		
	ARB	CCB	Beta blocker	ARB +Diuretics	ARB + CCB	B blocker + CCB
Grade 1	Telmisartan 68%	Cilnidipine 44%	Metoprolol 42%	Hydrochlorothiazide + Telmisartan 32%	Amlodipine + Telmisartan 34%	Amlodipine + Atenolol 58%
	Olmesartan 18%	Amlodipine 39%	Nebivolol 30%	Chlorthalidone + Telmisartan 32%	Cilnidipine + Telmisartan 32%	Amlodipine + Metoprolol 32%
Grade 2	Telmisartan 66%	Cilnidipine 48%	Metoprolol 43%	Chlorthalidone + Telmisartan 41%	Amlodipine + Telmisartan 37%	Amlodipine + Metoprolol 45%
	Olmesartan 20%	Amlodipine 36%	Nebivolol 43%	Hydrochlorothiazide + Telmisartan 30%	Amlodipine + Olmesartan29%	Amlodipine + Atenolol 36%
Grade 3	Telmisartan 78%	Cilnidipine 50%	Metoprolol 60%	Hydrochlorothiazide + Telmisartan 35%	Amlodipine + Telmisartan 58%	Amlodipine + Metoprolol 75%
	Olmesartan 9%	Amlodipine 31%	Propranolol 20%	Chlorthalidone + Telmisartan 29%	Cilnidipine + Telmisartan 25%	Amlodipine + Nebivolol 13%

ABSTRACTS

E-Poster Presentation:

A65.

A Retrospective EMR Based Study to Evaluate Patterns in Clinical Management among Hypertensives with History of Stroke in India: A Report of Baseline Data

MY Khan,[1] A Tandayam,[1] J Dalal,[2] U Khanna,[3] K Gaurav,[1] S Pandit,[1] S Sharma,[1] S Shah[4]

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Objective: Currently, the incidence of stroke in India is much higher than Western countries. Hypertension is one of the common risk factor for stroke and it is quite prevalent and inadequately controlled. This study was conducted to understand the presentation and drug utilization patterns among Indian hypertensives with history of stroke.

Methods: Electronic medical record data of 100075 Indian adult patients who were ≥18 years of age and diagnosed with hypertension (≥140/90 mmHg) as per the ESC/ESH (2018), were retrospectively analysed (June 2017 - June 2019). Around 40,985 patients with documented comorbidities were taking anti-hypertensive medications. A total of 374 hypertensives with the history of stroke were recorded and further segregated according to the grade of hypertension (Grade 1, 2 or 3). Each group was then observed for treatment patterns and findings were evaluated using simple descriptive statistics.

Results: Majority of grade 1 and grade 2 patients were prescribed with monotherapy (43% and 38% respectively). ARBs were the preferred class of drugs and Telmisartan was the most commonly prescribed drug. FDC combinations were second most commonly prescribed with ARB + CCB as most preferred class combination (25% and 27% respectively) and Amlodipine and Telmisartan were commonly combined. Among grade 3 hypertensives, FDCs were most commonly used (46%) with ARB plus CCB as most preferred class combination (50%) and Amlodipine + Telmisartan as commonly molecules (88%).

Conclusion: This study revealed presence of higher grades of hypertension (≈59% patients presenting with grade 2 and grade 3 hypertension) in Indian patients with history of stroke. Coexistence of Hypertension and stroke further increases the risk of recurrent events. Additionally, B.P lowering is very complex in these patients. Hence strict lifestyle modifications, starting with right anti-hypertensive medications and adherence to the therapy is very essential. The pattern of drug utilization in this study was consistent with recommendation of ESH/ESC (2018) guidelines (As per the guidelines, RAAS inhibitors, CCBs and thiazide diuretics were the most preferred choice for monotherapy and FDC both) Further large scale and long term studies to evaluate the association of hypertension and stroke in Indian patients.

Figure 1 – Classification of hypertensive patients with history of stroke in to various grades of hypertension
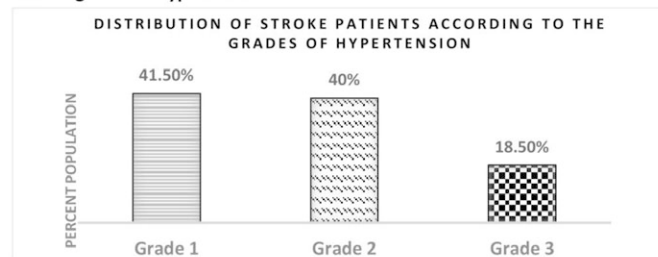

Figure 2 - Showing different drug combinations prescribed in stroke patients across all grades of hypertension
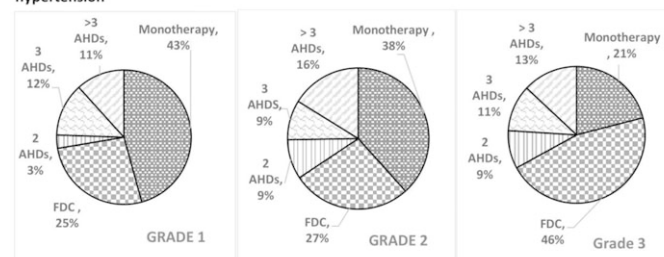
Table 1: Showing prescribing patterns of various therapy, Drug class and molecules in different grades of hypertension

S.N	Therapy			Grade 1	Grade 2	Grade 3
1	Monotherapy	ARB		43%	46%	40%
			Telmisartan	65%	68%	83%
			Losartan	18%	14%	17%
		Beta blocker		11%	3%	13%
			Propanolol	14%	20%	-
			Metoprolol	71%	60%	100%
		CCBs		33%	33%	40%
			Amlodipine	55%	27%	33%
			Cilnidipine	23%	27%	17%
2	FDC	ARB + Diuretics		21%	18%	25%
			Chlorthalidone + Telmisartan	38%	-	-
			Hydrochlorothiazide + Telmisartan	50%	57%	75%
		ARB + CCB		38%	50%	50%
			Amlodipine + Telmisartan	40%	50%	88%
			Cilnidipine + Telmisartan	20%	10%	6%
3	Multiple AHDs (2 or more)	ARB + Beta blocker + CCB	Telmisartan + Metoprolol + Amlodipine	11%	57%	13%
		ARB + Beta blocker	Telmisartan + Metoprolol	21%	7%	17%

ABSTRACTS

E-Poster Presentation:

A67.

Case-Control Study on Coronary Artery Disease Risk Factors in Male Population of Yogyakarta, Indonesia

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Objectives: Coronary artery disease (CAD) is the major cause of mortality in persons with risk factors, including hypertension, diabetes mellitus, and abdominal obesity. The objectives of this study were to identify the correlation of risk factors with CAD among male population in Yogyakarta, Indonesia and to provide a scientific basis for prevention in CAD.

Method: A case-control study was performed on subjects with angiographically proven significant CAD in a tertiary referral hospital of Yogyakarta, Indonesia and age-matched healthy controls. Control subjects were randomly selected from Sleman HDSS population who had negative indication of CAD in pre-tested questionnaire. Coronary risk factors were collected by a questionnaire. All subject underwent anthropometric measure, including the waist and hip circumference. The criteria of abdominal obesity based on waist circumference ≥90 cm and waist-to-hip ratio was ≥1 in male. The univariate analysis was performed with Cochran-Mantel-Haenszel Estimates. Odds ratios (OR) and their 95% confidence intervals (CI) for the association of risk factors with CAD.

Result: A total of 315 male subjects with age of 32-85 years with median of 59 years were enrolled in the case group and 315 age-matched male subjects in the control group. The main risk factors of CAD were hypertension (OR 3.763, 95% CI 2.703-5.240), diabetes mellitus (OR 3.511, 95% CI 2.236-5.512), and abdominal obesity based on waist circumference (OR 1.853, 95% CI 1.335-2.571) and waist-to-hip ratio (OR 1.832, 95% CI 1.303-2.575).

Conclusion: The conventional risk factors, such as hypertension, diabetes mellitus and abdominal obesity, were associated with CAD among male population in Yogyakarta, Indonesia. Appropriate intervention should be put in place to prevent CAD by managing identified risk factors.

A68.

Home Program of Cardiac Rehabilitation in Pandemic Era for Improving Functional Capacity after Prolonged Hospitalization: Post Mitral Valve Replacement Surgery and Diabetes Mellitus

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Objective: Heart disease due to valvular anomaly has increased prevalence along with increasing age. The operative management including reparation or substitution with prosthetic valve is the main therapy.

Cardiac rehabilitation is a multidisciplinary program established to assist individuals with heart disease in achieving optimal functional capacity. It is a complex and customized to individual patients with various cardiovascular diseases. Cardiac rehabilitation has become an accepted adjunct treatment for the majority of patients with cardiovascular disease, especially for those who have received cardiac surgery.

Diabetes mellitus is a common comorbidity in patients with cardiovascular disease, particularly in elderly patients, since many risk factors are shared between the two diseases, and diabetes mellitus increases the risk for cardiovascular disease and postoperative complication, so it can affect the rehabilitation program.

The outpatient program called Cardiac Rehabilitation Phase II is designed to meet the needs of the patient once the patient has left the hospital. The program consist of exercises that are supervised in cardiac rehabilitation center to monitor patient's responses to exercise. During the Covid-19 pandemic, non-emergency visit to the outpatient clinic are advised to be postponed. Home program become an important role in cardiac rehabilitation.

Methods: A case of 61 years old male patient with severe mitral regurgitation and type 2 diabetes mellitus underwent mitral valve replacement surgery. The patient had wound healing problem during hospitalization. The phase 1 cardiac rehabilitation programs were prolonged due to the patient condition and the long duration of the length of stay at hospital. Due to Covid-19 pandemic, the patient underwent home program for phase II cardiac rehabilitation after he discharged from the hospital, monitoring by online communication.

Result: There were increasing of count test, incentive spirometer, distance of 6 minute walking test, and METs results.

Conclusion: Comprehensive home program cardiac rehabilitation with monitoring, increase the functional capacity of patient with mitral valve replacement surgery and diabetes mellitus after prolong hospitalization.

ABSTRACTS

E-Poster Presentation:

A69.

Diagnostic Accuracy and Suitability of Instruments That Screen for Sleep Disorders in Cardiac Rehabilitation Patients

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Objectives: Screening for sleep disorders in cardiac rehabilitation settings is currently recommended. However, there is no clear recommendation about which convenient, effective and inexpensive tools that have high diagnostic accuracy should be used.

Methods: We searched online databases to identify patient reported outcome instruments that have been used in published research studies to assess the likelihood of obstructive sleep apnoea (OSA) in cardiac patients. For studies that provided diagnostic data, this was extracted and verified via an evidence-based diagnostic calculator. Where a sufficient number of studies was available, meta-analysis was conducted in order to obtain pooled estimates of specificity, sensitivity and diagnostic odds. Only two instruments, the Berlin Questionnaire (BQ) and the Stop-Bang (SB) met this criterion. We also identified and qualitatively evaluated instruments that have been used to identify other sleep disorders in cardiac patients.

Results: A total of 23 instruments were identified that have been used in research studies involving cardiac patients (6 for detecting likelihood of OSA, 2 for assessment of daytime sleepiness, 8 for sleep quality, 5 for insomnia and 2 for detecting multiple sleep conditions). A meta-analysis of 14 studies that assessed diagnostic accuracy of OSA, showed acceptable pooled sensitivity for two instruments: BQ, sensitivity=0.49 (95% CI 0.58-0.69) & SB, sensitivity= 0.93 (95% CI 0.87-0.96) but poor to moderate specificity (BQ, specificity=0.66 (95% CI 0.63-0.69) & SB, specificity=0.15 (95% CI 0.11-0.20)) at standard cut-off criteria. Pooled diagnostic odds ratios were superior for the SB compared to the BQ for prediction of mild OSA: SB DOR 4.17 (95% CI 1.38-12.59); BQ DOR 1.61 (95% CI 1.01-2.56) and marginally superior for prediction of moderate OSA: Stop-Bang DOR 2.68 (95% CI 0.84-8.55); BQ DOR 1.86 (95% CI 1.42-2.43)

Conclusion: There are promising practical tools available to correctly identify patients with OSA and other sleep disorders in cardiac rehabilitation settings, but alternative scoring algorithms may need to be used in order to improve specificity and correctly identify patients without OSA.

Pooled estimates of predictive values for diagnosing mild and moderate sleep apnoea in patients with acute coronary syndrome and atrial fibrillation

Instrument	No of studies	Sensitivity (95% CI)	Specificity (95% CI)	Diagnostic odds ratio (95% CI)	AUROC (SE)
Mild OSA					
Berlin Questionnaire	4	0.64 (0.58-0.69)	0.42 (0.34-0.51)	1.61 (1.01-2.56)	0.58 (0.04)
Stop-BANG ≥3	4	0.88 (0.83-0.91)	0.29 (0.22-0.37)	4.17 (1.38-12.59)	0.72 (0.08)
Mild OSA					
Berlin Questionnaire	8	0.49 (0.45-0.52)	0.66 (0.63-0.69)	1.86 (1.42-2.43)	0.60 (0.02)
Stop-BANG ≥3	5	0.93 (0.87-0.96)	0.15 (0.11-0.20)	2.68 (0.84-8.55)	0.66 (0.09)

OSA = Obstructive sleep apnoea, AUROC = area under receiver operator curve, CI =confidence interval, SE = standard error

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Please contact (+852)2420 7388 or HKPatientSafety@astrazeneca.com for reporting Individual Case Safety Report (ICSR) to AstraZeneca Hong Kong Limited.

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References
1. CRESTOR™ Hong Kong prescribing information.
2. FDA Drug Safety Communication: New restrictions, contraindications, and dose limitations for Zocor (simvastatin) to reduce the risk of muscle injury. Available at:
   https://www.fda.gov/drugs/drug-safety-and-availability/fda-drug-safety-communication-new-restrictions-contraindications-and-dose-limitations-zocor#Relative (Accessed on 26 February 2020).

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Presentation: Rosuvastatin calcium film-coated tablet. Indications: Primary Hyperlipidemia and Mixed Dyslipidemia – as an adjunct to diet to reduce elevated total-C, LDL-C, ApoB, nonHDL-C, and TG levels and to increase HDL-C; Pediatric Patients 10 to 17 years of age with Heterozygous Familial Hypercholesterolemia (HeFH) – as an adjunct: to diet to reduce Total-C, LDL-C and ApoB levels in adolescents, who are at least one year post-menarche, 10-17 years of age with heterozygous familial hypercholesterolemia if after an adequate trial of diet therapy the following findings are present: LDL-C > 190 mg/dL or > 160 mg/dL and there is a positive family history of premature cardiovascular disease (CVD) or two or more other CVD risk factors; Hypertriglyceridemia – as an adjunct to diet; Primary Dysbetalipoprotenemia – as an adjunct to diet; Homozygous familial hypercholesterolemia – to reduce LDL-C, total-C and ApoB; Slowing of the Progression of Atherosclerosis – as part of a treatment strategy to lower total-C and LDL-C to target levels as an adjunct to diet; Primary Prevention of Cardiovascular Disease – to reduce risk of stroke, myocardial infarction and arterial revascularization procedures in patients without clinically evident coronary heart disease but with an increased risk of cardiovascular disease based on age ≥ 50 years old in men and ≥ 60 years old in women, hsCRP ≥ 2 mg/L, and the presence of at least one additional cardiovascular disease risk factor such as hypertension, low HDL-C, smoking, or a family history of premature coronary heart disease. Dosage: The usual starting dose is 10-20mg. 40 mg only for patients not reaching LDL-C goal with 20 mg. Heterozygous Familial Hypercholesterolemia in Pediatric Patients (10-17 years of age) The usual dose range is 5-20mg/day; the maximum recommended dose is 20mg/day. Homozygous familial hypercholesterolemia Starting dose 20 mg. For patients taking cyclosporine, maximum 5 mg once daily; For patients taking fenofibrate, initiate with 5 mg daily dose, maximum 10 mg once daily; For patients taking lopinavir & ritonavir or atazanavir and ritonavir, maximum 10 mg once daily; Asian should be considered to start at 5 mg once daily; For patients with severe renal impairment, start at 5 mg daily, maximum 10 mg once daily. Contraindications: Hypersensitivity to rosuvastatin; active liver disease or unexplained persistent elevations of serum transaminases; pregnancy & lactation. Precautions: Skeletal muscle effects; Liver enzyme abnormalities; Hepatic failure; Concomitant coumarin anticoagulants; Proteinuria and hematuria; Endocrine effects and Concomitant use of fenofibrate. Interactions: Cyclosporine; Gemfibrozil; Atazanavir/ritonavir; Lopinavir/ritonavir; Simeprevir; Coumarin anticoagulants; Niacin and Antacid. Undesirable effects: Headache; Myalgia; Abdominal pain; Asthenia and Nausea. Full local prescribing information is available upon request. API.HK.CRE.0816

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