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Journal of the Hong Kong College of CARDIOLOGY

Proceedings of
4th Asian Preventive Cardiology
and
Cardiac Rehabilitation Conference
1-2 December 2012
Hong Kong

Journal of the Hong Kong College of Cardiology

Proceedings of 4th Asian Preventive Cardiology and Cardiac Rehabilitation Conference

1-2 December 2012

Hong Kong Convention and Exhibition Centre
Hong Kong

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Hong Kong College of Cardiology

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Journal of the Hong Kong College of Cardiology

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The Journal of the Hong Kong College of Cardiology publishes peer-reviewed articles on all aspects of cardiovascular disease, including original clinical studies, review articles and experimental investigations. As official journal of the Hong Kong College of Cardiology, the journal publishes abstracts of reports to be presented at the Scientific Sessions of the College as well as reports of the College-sponsored conferences.

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Title Page

- Include full name(s), degree(s) and affiliation(s) of author(s); list under file.
- Give a running title of 3 to 6 words.
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Abstract

- Abstract should be after title page and numbered page 1.
- It should not exceed 250 words for major articles; case reports should have abstracts of no more than 100 words.
- At the end of the abstract, provide a maximum of 6 key words suitable for indexing.
- Abbreviations should be kept to a minimum and must be explained when they first appear; after first use, abbreviations alone may be used.
- Standard abbreviations should be used for all measurements (SI units).

Text

- The text should follow the abstract and begin on a new page, as should References, Tables, and Legends.
- Abbreviations not defined in the abstract should be explained when they first appear in the text.
- References should be cited in numerical order, as should tables and figures.

References

- Number in the order in which they appear in the text.
- Abbreviate titles of periodicals according to the style of the Index Medicus.
- Follow the format (arrangement, punctuation) shown below:

Periodicals

1. Lewis T. Paroxysmal tachycardia. Heart 1909;1:43-72.
   (if more than three authors, please use "et al." after the third).

Books (edited by other authors of article)

2. Furman S. Pacemaker follow-up. In Barold SS, (eds): Modern Cardiac Pacing. Mount Kisco, New York, Futura Publishing Company, 1985, pp. 889-958.

Books (identical author and editor)

3. Chung EK. Principles of Cardiac Arrhythmias. Baltimore, MD, Williams & Wilkins, 1977, pp. 97-188.

Abstracts

4. Same as periodicals and followed by "(abstract)".

Tables

- Tables should supplement, but not duplicate, the text.
- Tables should be numbered consecutively in order of appearance in the text.
- Each table must be given an Arabic numeral and a title, placed at the top of the page.
- Abbreviations used in the table should be foot-noted and explained in the order in which they appear in the table, if they have not been previously used.
- Any material which is not self-explanatory should be foot-noted as well.

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- Be sure that legends and figures correspond.
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- Be sure abbreviations used for measurements are standard SI unit.

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- Submit either 3 black and white glossy prints or 2 prints and one photocopy, preferably of 13 cm x 18 cm (5" x 7") size.
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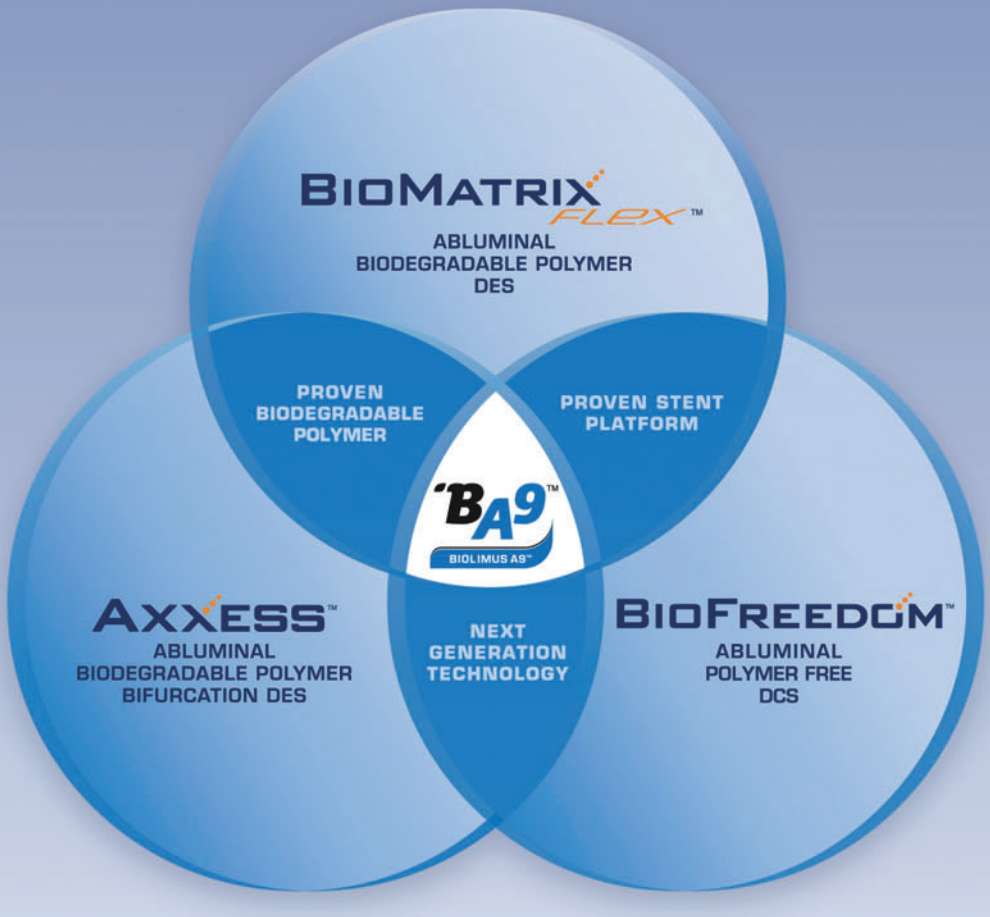

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December 2012
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THIS ISSUE OF THE J HK COLL CARDIOL DOCUMENTS 4TH ASIAN PREVENTIVE CARDIOLOGY AND CARDIAC REHABILITATION CONFERENCE. IT IS, THEREFORE, EDITED IN A DIFFERENT WAY AND STANDARD THAN THE REGULAR J HK COLL CARDIOL ISSUES.

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1. Elmfeldt D et al. The relationships between dose and antihypertensive effect of four AT1-receptor blockers: Differences in potency and efficacy. Blood Press 2002; 11: 293–301.
2. Lacourcière Y, Asmar R. A comparison of the efficacy and duration of action of candesartan cilexetil and losartan as assessed by clinic and ambulatory blood pressure after a missed dose, in truly hypertensive patients. A placebo-controlled, forced titration study. Am J Hypertens 1999; 12: 1181–87. TABPS0173. 03/1

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Preface

It gives us great pleasure to welcome you to this biennial conference, the 4th Asian Preventive Cardiology and Cardiac Rehabilitation Conference (APCCRC). Concerted effort of our College and continuous support from 20 supporting organizations including government, non-government, academic, service organizations as well as patient groups to conduct this conference demonstrates our dedication to prevention of heart diseases.

Over the past decade, the APCCRC has grown to be one of the major international conferences on Preventive Cardiology and Cardiac Rehabilitation. We shall continue to address on the prevention strategies against cardiovascular diseases with special emphasis on the control of various disk factors namely hypertension, hyperlipidemia, smoking, diabetes mellitus and obesity. There will also be updates on the various pharmacological advancements in the field of preventive cardiology.

The conference will begin with the Heart Foundation Lecture delivered by an unforgettable keynote speaker, Prof. David A. Wood from *Imperial College London*. He will talk on future prevention in cardiac diseases and Prof. Wood will enlighten us further on the controversy of HDL-cholesterol on the second day of the conference. This year, the Best Abstract & Best Poster Award has attracted a record-high submission of high quality abstracts & cases from local and overseas research colleagues from 17 regions and countries.

Meanwhile, due to many positive feedback received in 2010, there will be again the Jump Rope for Heart Public Conference conducted in Chinese for the local public for the enhancement of the knowledge and skills in self-management of patients and their carers.

We are looking forward to your contribution and participation. Your continuous support is a huge vote of confidence for us to keep hosting this conference.

See you in Hong Kong again for APCCRC 2014!

Dr. Ngai-yin CHAN
Co-Chairman
Executive Committee

Dr. Leonard Sheung-wai LI
Co-Chairman
Executive Committee

ACRA 2013

Bridging the Divide

12 – 14 AUGUST 2013
THE SEBEL ALBERT PARK, MELBOURNE
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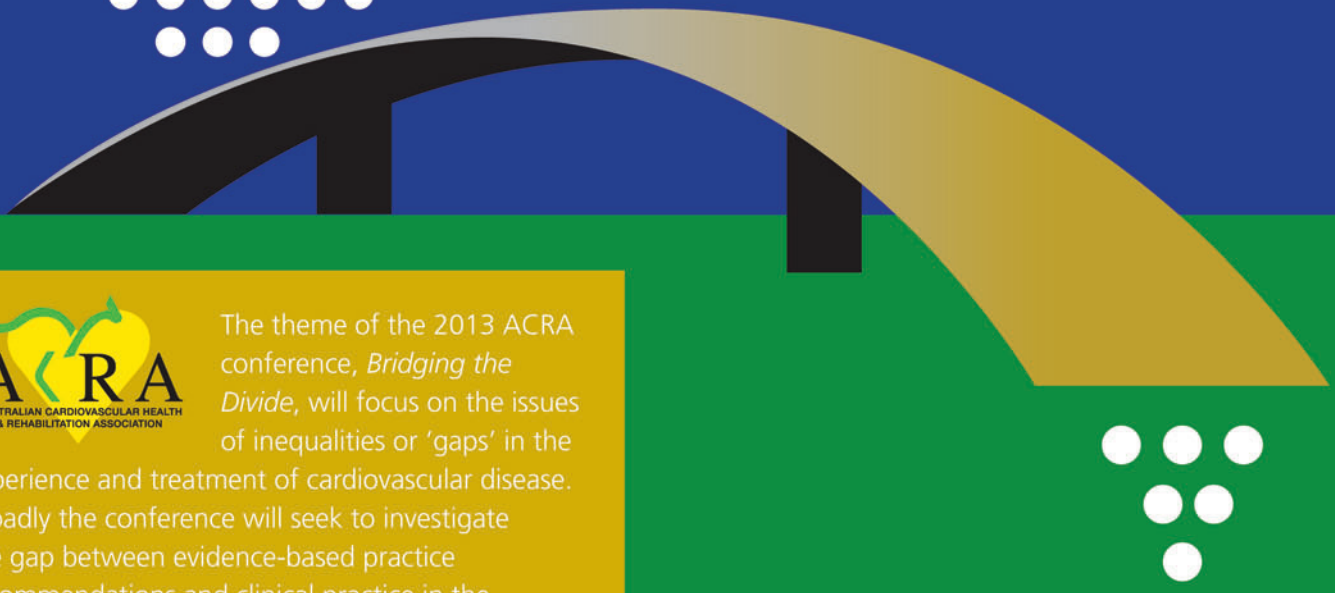

ACRA
AUSTRALIAN CARDIOVASCULAR HEALTH & REHABILITATION ASSOCIATION

The theme of the 2013 ACRA conference, *Bridging the Divide*, will focus on the issues of inequalities or 'gaps' in the experience and treatment of cardiovascular disease. Broadly the conference will seek to investigate the gap between evidence-based practice recommendations and clinical practice in the care of cardiovascular patients. More specifically, the concurrent sessions will seek to address socioeconomic, cultural, geographic, gender-related and psychosocial barriers and inequalities. Within each sub-theme, both empirical research studies revealing evidence of the 'gap', and evaluations of care to 'address the gap', will be presented.

The conference aims to recognise the challenges faced by both patients and health professionals in dealing with cardiovascular disease and the implications this has on the delivery of care to patients.

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PROGRAMME

(A) 4th Asian Preventive Cardiology and Cardiac Rehabilitation Conference

SATURDAY, 1 DECEMBER 2012

0815 Foyer REGISTRATION

0900-1030 S421 SYMPOSIUM 1 – ABSTRACT & CASE PRESENTATION I

Chairpersons: Mr. Dick Tak-lai CHENG
Dr. Chun-leung LAU
Dr. Kai-chi LEUNG

1.	MULTIDISCIPLINARY REHABILITATION PROGRAM IN PATIENTS WITH ADVANCED HEART FAILURE AFTER CARDIAC RESYNCHRONIZATION THERAPY	Dr. Andrew K.Y. NG
2.	THE ROLE OF PERSONAL RESOURCES IN PATIENTS WITH CORONARY HEART DISEASE IN RESPONSE TO CARDIAC REHABILITATION PROGRAM	Dr. Kris W.N. WONG
3.	SIX MINUTE WALK DISTANCE IN PATIENTS AFTER PHASE I CARDIAC REHABILITATION PROGRAMS	Ms. Shu-fang HSIAO
4.	IS THERE A SIGNIFICANT IMPROVEMENT IN HEART RATE RECOVERY OVER CARDIAC REHABILITATION PROGRAMS?	Mr. Azran AHMAD
5.	HEALTH EDUCATION OF INTENSIVE CARDIAC REHABILITATION (ICR) GIVE IMPACT AFTER CARDIAC SURGERY IN KELANTAN, MALAYSIA	Ms. Mamat ZAKIRA
6.	TAI CHI AS AN ALTERNATIVE CARDIAC REHABILITATION 'WARM UP' EXERCISE	Mr. Michael KOLARIK
7.	CARDIAC REHABILITATION PROGRAM IN PRIVATE PRACTICE IN HONG KONG	Dr. Albert W.S. LEUNG
8.	MEASUREMENT OF THE EFFECTIVENESS OF STRUCTURED EDUCATION INTERVENTIONS FOR CARDIAC REHABILITATION PARTICIPANTS	Mr. Stephen WOODRUFFE
9.	INFLUENCE ON THE RESTENOSIS RATE OF EARLY INTRODUCTION OF CARDIAC REHABILITATION AFTER PERCUTANEOUS CORONARY INTERVENTION	Dr. Junji IWASAKA

S427 SYMPOSIUM I – ABSTRACT & CASE PRESENTATION II

Chairpersons: Dr. Man-chun CHOI
Dr. Cheuk-tuen CHING
Dr. Raymond Chi-yan FUNG

10.	PSYCHOLOGICAL CORRELATES OF STAGE OF READINESS TO QUIT AMONG HONG KONG CHINESE SMOKERS: THE ROLE OF SOCIAL ACCEPTANCE OF SMOKING BY FAMILY AND FRIENDS	Dr. Doris Y.P. LEUNG
11.	RATES OF ATTENDANCE AT A SMOKING CESSATION CLINIC WITHIN A CARDIAC REHABILITATION SERVICE	Mr. Paul CAMP
12.	OBESITY IS A MAJOR RISK FACTOR FOR OTHER CARDIOVASCULAR RISK FACTORS	Dr. Sadeghi TAHEREH
13.	CREATIVE FRUITY VENTURE – FINDS ITS WAY TO PROMOTE FRUIT CONSUMPTION AMONG SECONDARY STUDENTS	Mr. Kin-hang KUNG
14.	OUT-PATIENT CARDIAC REHABILITATION PROGRAM (CRP) FOR PATIENTS AFTER LEFT VENTRICULAR ASSISTED DEVICE (LVAD) – FIRST EXPERIENCE IN HONG KONG	Dr. Katherine Y.Y. FAN
15.	CARDIAC REHABILITATION PROGRAM: BEGINNING OF A NEW LIFE STYLE REVAMP	Dr. Frankie C.C. TAM
16.	CAN PARTICIPATION IN 4 WEEKS PHASE II CARDIAC REHABILITATION PROGRAM (CRP) IMPROVE FITNESS AND FUNCTIONAL CAPACITY?	Mr. Azran AHMAD

		17. IMPROVEMENT IN EXERCISE TOLERANCE IN PATIENTS WITH A CUTEST ELEVATION MYOCARDIAL INFARCTION RECEIVED PRIMARY PERCUTANEOUS CORONARY INTERVENTION AFTER CARDIAC REHABILITATION IN HONG KONG – A SINGLE CENTER EXPERIENCE	Dr. Frankie C.C. TAM
		18. DETERMINANTS FOR ACHIEVING THE LDL-C TARGET OF LIPID CONTROL FOR SECONDARY PREVENTION OF CARDIOVASCULAR EVENTS IN TAIWAN	Prof. Chau-chung WU
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1100-1230	S427	SYMPOSIUM 2 – ABSTRACT & CASE PRESENTATION III ***Chairpersons: Dr. Adrian CHEONG*** ***Dr. Kin-kwun KEUNG*** ***Dr. Sunny Chiu-sun YUE***	
		19. SUPERVISED AND INDIVIDUALIZED EXERCISE TRAINING INCREASE THE EXERCISE COMPLIANCE OF THE PATIENTS WITH MYOCARDIAL INFARCTION	Dr. Kushal MADAN
		20. REHABILITATION COMPANION SYSTEM FOR PHASE III&IV CARDIAC REHABILITATION	Mr. Bo-ru WU
		21. EFFECT OF STRUCTURED TEACHING PROGRAM ON NUTRITIONAL HABITS OF HOSPITALIZED ANGINA PECTORIS PATIENTS	Ms. Akram SHAHROKHI
		22. FACTORS INFLUENCING HEALTH-RELATED QUALITY OF LIFE IN HONG KONG CHINESE PATIENTS WITH IMPLANTABLE CARDIOVERTER DEFIBRILLATOR (ICD)	Ms. Florence M. F. WONG
		23. ATRIAL FIBRILLATION AND EARLY OUTCOMES AFTER MITRAL VALVE REPLACEMENT IN PATIENTS WITH RHEUMATIC VS. NON-RHEUMATIC MITRAL STENOSIS	Dr. Seyed Mohammad Yousof MOSTAFAVIPOUR MANSHADI
		24. SUCCESSFUL INDUCED HYPOTHERMIA POST-CARDIAC ARREST: EVALUATING PROTOCOLS TO EXPAND THERAPEUTIC SCOPE	Prof. Michael CHAN
		25. EFFECT OF MILRINONE ON SHORT TERM OUTCOME OF PATIENTS WITH MYOCARDIAL DYSFUNCTION UNDERGOING OFF-PUMP CORONARY ARTERY BYPASS GRAFT: A RANDOMIZED CLINICAL TRIAL	Dr. Seyed Mohammad Yousof MOSTAFAVIPOUR MANSHADI
		26. THE EFFECTS OF SYNERGY MODEL ON NURSES' QUALITY CARE AND THE SATISFACTION OF PATIENTS WITH ACS	Mr. Karimyar Jahromi MAHDI
	S421	SYMPOSIUM 2 – BEST ABSTRACT PRESENTATION ***Chairpersons: Dr. Kwok-keung CHAN*** ***Dr. Leonard Sheung-wai LI***	
		27. FATTY LIVER AND BLOOD PRESSURE RESPONSE DURING EXERCISE	Dr. Antonio G. LAURINAVICIUS
		28. BLOOD PRESSURE HYPER-REACTIVITY DURING EXERCISE IS RELATED TO THE DEGREE OF HEPATIC STEATOSIS	Dr. Antonio G. LAURINAVICIUS
		29. RELATIONSHIP OF SERUM HIGH SENSITIVITY C-REACTIVE PROTEIN TO METABOLIC SYNDROME – BULGARIAN PROSPECTIVE STUDY	Dr. Galya NAYDENOVA
		30. OBESITY IN EGYPTIAN CHILDREN: EFFECT ON CARDIAC FUNCTION AND DIMENSIONS	Prof. Inas SAAD
		31. SAMPURNA HRIDAY SHUDHIKARAN (SHS): A NOVEL NONINVASIVE HERBAL PROCEDURE TO IMPROVE EFFORT TOLERANCE IN CHRONIC HEART FAILURE	Dr. Rohit SANE
1230-1400		LUNCH BREAK	
1400-1430	S421	OPENING CEREMONY	

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		Chairpersons: Prof. Chu-pak LAU	
		Dr. Suet-ting LAU	
		1. Cardiac Rehabilitation is Yesterday's Service – Tomorrow's is Preventive Cardiology	Prof. David WOOD
		2. Cardiovascular Risk Factors in Hong Kong	Prof. Bernard M.Y. CHEUNG
1545-1615	S423-S424	TEA BREAK & EXHIBITS POSTER PRESENTATION II	
1615-1730	S421	SYMPOSIUM 4 – Cardiovascular Risk Factors Management I	
		Chairpersons: Dr. Kwok-keung CHAN	
		Dr. Chiu-on PUN	
		Dr. Tak-fu TSE	
		1. Control of Risk Factors by Non-pharmacologic Interventions: Role of Life Style Changes in the Prevention of CVD	Dr. Mario MARANHAO
		2. Control of Hypertension Other Than Medical Treatment	Prof. Andrzej JANUSZEWICZ
		3. Lipid Treatment Update	Prof. Brian TOMLINSON

SUNDAY, 2 DECEMBER 2012

0815	Foyer	REGISTRATION	
0900-1040	S421	SYMPOSIUM 5 – Perspectives in Cardiac Rehabilitation	
		Chairpersons: Dr. Eddie Siu-lun CHOW	
		Dr. Leonard Sheung-wai LI	
		Panelists: Dr. Wai-kwong CHAN	
		Dr. Iris KWAN	
		Dr. Kei-pui LEUNG	
		Dr. Gary Yiu-kwong MAK	
		1. Cardiac Rehabilitation Program for Patients after Coronary Artery Bypass Grafting Surgery	Prof. Ssu-yuan CHEN
		2. The Development or Guidelines in Cardiac Rehabilitation in China	Dr. Lan GUO
		3. Remote Medicine in Home Cardiac Rehabilitation by ICT	Prof. Yutaka KIMURA
		4. Cardiac Rehabilitation: Why Underutilized? Are there solutions?	Dr. M.Y. SAARI
		5. Panel Discussion	
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		Chairpersons: Dr. Kam-tim CHAN	
		Dr. Chun-ho CHENG	
		Dr. Patrick Tak-him KO	
		Dr. Shu-keung KWONG	
		1. The Safety of Exercise in Patients with Known Heart Disease	Dr. Jimmy LIM
		2. Cardiac Rehabilitation Issues: Return to Work	Dr. Visal KANTARATANAKUL
		3. Tobacco Policies and Prevention of CVD in Asia	Dr. Judith MACKAY
		4. Advance Treatment with OAP for Acute Coronary Syndrome	Dr. Jeffrey FUNG

1240-1400		LUNCH BREAK	
1400-1530	S421	SYMPOSIUM 7 – Cardiac Rehabilitation and Issues in Preventive Cardiology II ***Chairpersons: Dr. Charles Kau-chung HO*** ***Dr. Kai-fat TSE*** ***Dr. Cho-yiu WONG***	
		1. The Utilisation of Cardiovascular Imaging for Detection of Early Atherosclerosis	Dr. Carmen Wing-sze CHAN
		2. Stroke Prevention in AF	Dr. David Chung-wah SIU
		3. How to Improve the Drug Compliance of Hypertensive Patients	Dr. Chun-wai LAM
1530-1600	S423-S424	TEA BREAK & EXHIBITS & POSTER EXHIBITS	
1600-1730	S421	Best Abstract & Best Poster Award Presentation SYMPOSIUM 8 – Cardiovascular Risk Factors Management II ***Chairpersons: Dr. Ngai-yin CHAN*** ***Dr. Kathy Lai-fun LEE*** ***Dr. Shu-kin LI***	
		1. Prevention of Hypoglycemia – The Evidence of Incretin-Based Therapy	Dr. Cheung-hei CHOI
		2. HDL-cholesterol: Risk Factor or Risk Target	Prof. David WOOD

♦♦♦♦♦♦

(B) 跳繩強心公眾研討會暨工作坊

SUNDAY, 2 DECEMBER 2012

0900-0915	S427	開幕典禮	陳藝賢醫生 (心臟科專科醫生)
0915-1030	S427	第一部 (講座) 「心臟新法寶」– 革命性的新發展	張仁宇醫生 (威爾斯親王醫院心臟科醫生)
		中醫護心有術	崔紹漢博士 (香港浸會大學中醫學博士)
1030-1100		中場休息	
1100-1300	S426	第二部 (工作坊) 如何選有益心臟健康的功能性食物	林思為小姐 (香港營養師協會會長及高級註冊營養師)
	S427	護心健體運動	羅培楷先生 (香港復康會物理治療師) 陳建銘先生 (香港物理治療學會物理治療師)

ABSTRACTS

Abstracts Presentation (Oral):

1.

Multidisciplinary Rehabilitation Program in Patients with Advanced Heart Failure after Cardiac Resynchronization Therapy

KY NG,[1] K FAN,[1] G YIP,[1] JYY NG,[2] B YUNK,[2] KYP CHAN,[1] KY CHENG,[1] KW LAI,[1] KW SIT,[1] D CHAN[2]

[1]Cardiac Rehabilitation Center, Cardiac Medical Unit; [2]Physiotherapy Department, Grantham Hospital, Hong Kong

Introduction: Cardiac resynchronization therapy (CRT) has been proven to improve functional class and systolic function in heart failure patients (NYHA class III- ambulatory IV) and additional cardiac rehabilitation program with exercise training in this high risk group remains to be determined.

Objective: The objective of this program was to assess further improvement of exercise capacity of patients with advanced heart failure after CRT through multidisciplinary cardiac rehabilitation program.

Methods: Twelve patients (5 women and 7 men; mean age 48, ranged 18-70) who received CRT (mean duration of 2.2 months) further completed an 8-week multidisciplinary cardiac rehabilitation program with aerobic exercise training (including 3 sessions/week with a total of 24 sessions & 40 minutes/session on treadmill walking & cycling) plus specific counseling services on heart failure disease with emphasis on patients' self-management, in the Cardiac Rehabilitation Center of Grantham Hospital. Cardiopulmonary exercise test (CPET) and six-minute hall walk (6-MWT) were assessed and compared at baseline (before implantation of CRT), after CRT and after rehabilitation respectively.

Results: There were statistically significantly further improvement on the duration (seconds) of the CPET (614±166 to 743.46±147, $p<0.001$), peak VO_2 (ml/kg/min.) (17.44±4.76 to 20.11+5.36, $p<0.001$), MET level (4.97±1.37 to 5.73±1.53, $p<0.001$), oxygen pulse (9.46±3.76 to 10.58±3.36, $p<0.05$), VE/VCO2 (39.42±8.40 to 36.58±7.82, $p<0.05$) as well as 6-MWT (meters) (433±58.95 to 494.33±74.77, $p<0.001$) after the 8-week rehabilitation program. After physicians' assessment, 4 subjects out of 6 (who were originally on heart transplantation work up) were deleted from the heart transplantation waiting list due to the improvement of functional class to NYHA class II.

Conclusions: Well prescribed exercise training program specifically designed for heart failure patients who received evidence-based heart failure therapy is beneficial and safe. Additional multidisciplinary intervention further improved patients' well being.

2.

The Role of Personal Resources in Patients with Coronary Heart Disease in Response to Cardiac Rehabilitation Program

KWN WONG,[1] ST KWOK[2]

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Purpose of the Study: This study investigated the impact of personal resources (including optimism, self-esteem, perceived control, social support, and gratitude) on outcome measures in Chinese coronary heart disease (CHD) patients in response to a cardiac rehabilitation program. The posttraumatic growth among Chinese CHD patients and how far personal resources predicted posttraumatic growth among these patients were also examined.

Methods: 67 Chinese patients with CHD went through an 8-week cardiac rehabilitation program that consisted of structured exercise sessions, nursing care, and health education and promotion. Physiological impairment parameters were assessed pre- and post-program. Blood profiles were obtained during the first consultation and subsequent follow-up at the cardiac centre. Personal resources data and general health status were collected in the first consultation while the posttraumatic growth data and the post program general health status were collected at the last session of the program.

Results: Results indicated that CHD patients high in personal resources achieved better outcomes than those low in personal resources, as indicated by higher physical and mental summary measures in SF-36, lower cholesterol levels and better performance on the 6-minute walk test. Moreover, personal resources were demonstrated to be a significant predictor of the level of posttraumatic growth although the rehabilitation program exerted a weak mediating effect on the link between personal resources and posttraumatic growth.

Conclusion: Human beings are able to experience growth after a life-threatening disease, and this can be predicted by individual difference in personal resources. In addition to teaching the client to manage their physical health in rehabilitation program, it may be beneficial to incorporate trainings or interventions in the rehabilitation program to increase personal resources of individuals.

ABSTRACTS

Abstracts Presentation (Oral):

3.

Six Minute Walk Distance in Patients after Phase I Cardiac Rehabilitation Prgroams

SF HSIAO,[1] PC LU,[1] YJ LIN,[1] CS LIN,[1] SY CHEN,[1] SS WANG,[2] RB HSU,[2] C LAN,[1] JS LAI[1]

[1]Department of Physical Medicine and Rehabilitation; [2]Department of Surgery, National Taiwan University Hospital, Taipei, Taiwan

Purpose: Phase I cardiac rehabilitation program (CRP) delivers preventive and rehabilitative services to hospitalized patients following acute coronary syndrome or cardiac surgery. The literatures on the exercise capacity of patients after phase I CPR was scarce. Six-minute walk test (6MWT) is easy and simple to administer and enables to indicate the exercise capacity of patients with cardiac or pulmonary diseases. The purposes of this study were to investigate 6MWT of patients after phase I CPR before discharge and to explore its correlated factors.

Materials and Methods: We retrospectively reviewed the medical records of patients who were referred to phase I CRP in our medical center from January 2011 to December 2011. Phase I CRP and 6MWT were performed by physical therapist during hospitalization before discharge.

Results: Our study subjects were 203 male and 63 female patients with mean age of 57.2±14.0 years; weight: 64.6±12.1 kg; height: 163.7±8.0 cm, left ventricular ejection fraction: 61.21±12.95%. The diagnosis of phase I CRP referral included percutaneous coronary intervention (n=28, 10.5%), coronary artery bypass surgery (n=110, 41.4%), and other cardiac surgery (n=128, 48.1%). Their risk factors of cardiovascular diseases included diabetes (32.0%), dyslipidemia (26.3%), and hypertension (57.5%). Distance walked in 6MWT in all subjects was 312.3±86.7 m. Heart rate increased 11.9±10.6 beat/min. Systolic blood pressure (SBP) elevated 10.6± 14.7 mmHg. Abnormal SBP drop more than 10 mmHg was rare (n=9, 3.3%). Obvious heart rate drop of more than 10 beat/min was only observed in 2 subjects. Body height corrected walking distance was less in elder group (278.2±78.8 m versus 329.5±85.6 m, $p<0.0001$). Findings of 6MWT distance were not significantly correlated with diagnosis and risk factors of cardiovascular diseases.

Conclusions: At the end of phase I CRP, 6MWT can be safely performed among ambulatory patients. The elder cardiac patients had significantly shorter 6MWT distance.

4.

Is There a Significant Improvement in Heart Rate Recovery Over Cardiac Rehabilitation Programs?

A AHMAD

Department of Physiotherapy & Rehabilitation, National Heart Institute, Kuala Lumpur, Malaysia

Background: The fall in heart rate (heart rate recovery) immediately after exercise is a marker of vagal tone that findings have shown to be a powerful predictor of all caused mortality. Heart rate recovery should be evaluated before and after completion of cardiac rehabilitation program. The purpose of this study aimed to evaluate the effect of exercise based cardiac rehabilitation on heart rate recovery.

Method: Each individual entering the Phase II cardiac rehabilitation program undertakes a pre assessment. In all of our pre and post assessment, the step test is used as our measure of cardiovascular fitness, prognostic marker mortality and the patient's perceived workload. For this abstract the step test result will be presented as a measure of each patient's progress throughout phase II. The step test requires stepping up and down onto 12-inch step for one minute. The heart rate is then taken for 60 seconds to show signs of recovery and the patients Borg rating perceived exertion (RPE) is assessed. The analyses of the result are presented by comparing the pre and post assessment step test heart rate and results.

Results: 48 patients who completed Phase II of the cardiac rehabilitation program between January to April 2012 were analyzed. The sample consisted of 48 patients; (24 cardiology cases vs. 24 cardiothoracic cases) age range 29 years-77 years (mean = 56 years). Thirty-nine (92%) of the patients showed an improvement as measured by heart rate recovery and RPE. Of the remaining patients 9 (21.4%) showed no improvement within both group after 4 weeks cardiac rehabilitation program demonstrates significant change in heart rate recovery. Among this two group, cardiology patients showed a significant improvement 14 (58.3%) before enrolling for cardiac rehabilitation program increased to 23 (95.8%) after completed the program.

Conclusion: Regular structured exercise in cardiac rehabilitation program increases functional capacity. A simple functional exercise assessment is a valuable way to audit Phase II cardiac rehabilitation. It is also a good way of providing objective feedback to the patient.

ABSTRACTS

Abstracts Presentation (Oral):

5.

Health Education of Intensive Cardiac Rehabilitation (ICR) Give Impact after Cardiac Surgery in Kelantan, Malaysia

M ZAKIRA, G MOHAMAD ZIYADI, A MOHAMED RUSLI, LA KHATIJAH
University of Sciences Malaysia, Malaysia

Health education in Intensive cardiac rehabilitation is an effective program to improve quality of life for patients after cardiac surgery. In developing countries cardiovascular disease still a main cause of death and quality of life patients is low compare with others country. This pilot study was conducted in HUSM using non rondomised control trial design to evaluate the quality of life of cardiac surgery patients after an intensive cardiac rehabilitation programme. A total of 30 patients with cardiac problems admitted to Coronary Intensive Care Unit (CICU) and planned for cardiac surgery was assigned into control (group A) n=15, and experimental (group B) n=15 groups. Participants in group A were using Intensive Cardiac Rehabilitation (ICR) module A (HUSM) whereas group B was using module B(IREKAF). Quality of life (QOL) was measured four times (pre-test, phase 1, phase 2 and phase 3) using self-administered questionnaire generic SF 36. The repeated measure ANOVA were used to analyse the difference in score of QOL among group A and B and the time effect of QOL when patient following ICR. The results showed that group B score higher than group A for SF 36 ($p<0.05$). The time effect for SF 36 showed that there was only one pair (t1 and t0) for which there were no significant difference with p-value >alpha 0.05. The differences for all the other pair were significant at $p<0.05$. Group B was higher time effect compare with group A. In conclusion, findings of this pilot study indicated that ICR module B was better than ICR module A in improving QOL of patients after cardiac surgery. It is recommended that an evaluation of QOL should be done after 12 weeks of cardiac rehabilitation programme.

6.

Tai Chi as an Alternative Cardiac Rehabilitation 'Warm up' Exercise

M KOLARIK, C NEWTON
Southern Health, Victoria, Australia/Clayton Community Rehabilitation Centre, Australia

Objective: Incorporate *Shibashi* (18 movements) Tai Chi style 'warm up' exercise into the Cardiac Rehabilitation Program (CRP). Add variety, stimulate client interest and encourage on going participation on discharge. Evaluate Tai Chi as a viable alternative to conventional exercise.

Background: Southern Health (SH) is the largest healthcare provider in Melbourne, Victoria. Recent standardization of CRP delivery in Community Rehabilitation Centers (CRC) resulted in the current 7 session weekly outpatient program including 1 hour of physical exercise and cardiac education respectively. In 2009 a systematic review of Tai Chi exercise for patients with cardiovascular conditions and risk factors was published. It concluded there is evidence that Tai Chi exercise may be a beneficial adjunctive therapy. In 2009 and 2011, 2 posters titled *Cardiac Chi* and *Tai Chi as an alternative cardiac rehabilitation 'warm up' exercise* were presented at the annual Victorian Association Cardiac Rehabilitation (VACR) Conference.

Method: The CRP Quality Project commenced in 2010. Staff introduced a 10 minute Shibashi Tai Chi 'warm up' that alternated every 3 weeks with conventional exercise. The 22 clients surveyed, all practiced and then compared both styles. On discharge they all completed a 5 question evaluation survey.

Results: (T=21 clients)

- 100% of clients agreed that Tai Chi was an effective 'warm up' in preparation for cardiac rehabilitation exercise
- 100% of clients agreed they could comfortably and effectively participate in Tai Chi
- 75% of clients preferred Tai Chi over conventional exercise
- 76% of clients did not use Tai Chi as a warm up exercise at home
- 62% of clients will consider taking up regular Tai Chi exercise

Conclusion: Tai Chi 'warm up' was incorporated into the CRP in October 2011 and is a viable alternative to conventional exercise. It is safe, suitable for all ages, flexible in delivery and enjoyable for clients. Further research is required to ascertain whether regular Tai Chi exercise has cardiac health benefits after discharge.

ABSTRACTS

Abstracts Presentation (Oral):

7.

Cardiac Rehabilitation Program in Private Practice in Hong Kong

AWS LEUNG, GYK MAK, CTH CHOW, SSW LAM, TMF LIU, DWH LUI, AWF TAM
PRO-CARDIO Heart Disease & Stroke Prevention Centre, Hong Kong

Introduction: In Hong Kong, structured cardiac rehabilitation (CR) programs have been developed since the 1990's. Surveys on the CR service in Hong Kong were conducted in 2002 and 2005, showing that phases I and II services were provided mainly in the public hospital system, while the community-based phases III and IV services were provided by non-government organizations or patient self-help groups. There was CR program in one of the private hospitals, and most private cardiologists had considered it useful.
Objective: To set up a clinic-based structured CR program in private sector in Hong Kong, to analyze the similarities to and differences from those of public sector, and to evaluate on the current status.
Results: The program was introduced in June 2011, and fully implemented in November 2011, as a clinic-based phase II service. It is recommended mainly for patients with heart attack (post-AMI), heart failure, or after interventional procedures. Service providers include a nurse, a dietitian and a physical trainer, with cardiologists as organizers and supporters. Participants can choose an either 4-week or 8-week program, which is either individual- or group-based. Each participant attends 1 session per week. A 30-minute consultation is given in every session, which covers drug knowledge, nutrition therapy, psycho-social counseling, and smoke cessation. Exercise capacity is assessed through treadmill test, and exercise therapy is prescribed by a cardiologist according to the result. Exercise training is carried out for 45-60 minutes in each session by the physical trainer. Program extension for an extra 4-8 weeks will be considered if appropriate. Progress on participants was monitored by evaluating improvement in quality of life (QOL). Since the program was started, 25 participants had been recruited (19 males and 6 females). Twenty-three were post-PCI (including 4 AMI) cases, 1 heart failure and 1 valve replacement. Ten patients attended 8-weeks program, while 15 attended 4-week program. QOL evaluation was done for 10 participants, and 7 of them showed improvement.
Conclusion: This study illustrated the implementation of a structured phase II cardiac rehabilitation program in a private clinic in Hong Kong. Owe to the fundamental differences from the public setting, there are diversities from the public counterpart in the logistic, design and workflow of the program. Twenty-five participants had joined the program, and their responses were positive and encouraging. Further program review and evaluation will be accomplished.

8.

Measurement of the Effectiveness of Structured Education Interventions for Cardiac Rehabilitation Participants

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Ipswich Cardiac Rehabilitation Service, Australia

Introduction: The Ipswich Cardiac Rehabilitation Service provides a six-week Phase Two exercise and education program. The heart health education program is provided via up to twelve; 60 minute education sessions or a Fast Track education day (6.5 hours). Each participant is also provided individual risk factor modification education, advice and counseling. This is delivered via the use of clinical pathways, patient questionnaires, one-to-one discussions and referral to allied health specialists. An evaluation tool was developed to measure the effectiveness of the educational program on participant's heart health knowledge.
Methods: This tool was provided to participants at their first presentation to our Service and at the completion of their program. The tool assessed knowledge of general and individual lifestyle factors that contribute to poor heart health, medication awareness, ideal levels for lipids and blood pressure measures, use of alcohol, managing emotional well-being and recommended exercise intensity.
During the period from January 2011 to May 2012; 277 pre and 205 post questionnaires were collected. Data from these completed tools were collated and analysed.
Results: Poor diet (pre 67%, post 80%), inactivity (pre 60%, post 64%) and smoking (pre 48%, post 62%) were most often selected to contribute to poor heart health. The inverse of these factors were chosen most often to improve heart health: Physical activity (pre 79%, post 90%), Good diet (pre 74%, post 90%) and QUIT smoking (pre 21%, post 28%) . Pre program, less than half of participants selected HDL as the "Good" cholesterol. This measure increased from 41% to 78% of completers. Awareness of Heart Foundation Australia recommended levels for lipids increased in the order of 24-35% of completers. Assessments of exercise intensity, "Lightly puffing" (30% increase) and RPE 3-4 (15% increase) proves that participants are more aware of recommended exercise intensity levels at completion of their program.
Summary: There seems to be the opportunity during phase two cardiac rehabilitation to enhance the effectiveness of traditional education sessions via the use of clinical pathways and a structured approach to interventions tailored to individual patient needs. Implementation of this questionnaire tool provided the opportunity to address individual patient knowledge gaps.

ABSTRACTS

Abstracts Presentation (Oral):

9.

Influence on the Restenosis Rate of Early Introduction of Cardiac Rehabilitation after Percutaneous Coronary Intervention

J IWASAKA, T TAKAHASHI, M KUBOTA, Y IHARADA, H OTANI, T IWASAKA, I SHIOJIMA, Y KIMURA
Department of Internal Medicine II, Kansai Medical University, Japan

Background: Though devices of percutaneous coronary intervention (PCI) such as drug eluting stent (DES) has been markedly developed, the problem of restenosis is still remained.
Objectives: We assessed protocol of early introduction of cardiac rehabilitation after PCI adopted in middle 2010 in our hospital.
Methods: We assessed the 29 cases performed PCI and enrolled our cardiac rehabilitation program from 2009 to 2011. Thirteen patients were enrolled to old program, which started 30 days after PCI. Sixteen were enrolled to new program, which started low-grade exercise next day of PCI and star regular exercise 40 days after PCI.
Results: Restenosis was found in 5 cases in old program group and 3 cases in new program group. Three patients were suffered from restenosis with DES in old program group (3/7), indeed no restenosis was found in patients with DES in new program group. No significant differences were found in blood pressure and lipid profiles.
Conclusion: Early introduction of cardiac rehabilitation after PCI may lead the reduction of restenosis ratio even in DES era.

10.

Psychological Correlates of Stage of Readiness to Quit Among Hong Kong Chinese Smokers: The Role of Social Acceptance of Smoking by Family and Friends

DYP LEUNG, EML WONG, SY CHAIR
The Nethersole School of Nursing, The Chinese University of Hong Kong, Hong Kong

Objective: The Attitude-Social Influence-Efficacy (ASE) model was developed from the Theory of Reasoned Action and Bandura's Social Cognitive Theory together with the Transtheoretical models have been used to gain insight into the determinants and guide the development of interventions for smoking cessation. Yet, no study has reported the impacts of ASE constructs on the readiness to quit of Hong Kong smokers in one study. This study thus aims to explore the associations between ASE constructs and readiness to quit smoking among Hong Kong Chinese smokers.
Methods: A cross-sectional study design was employed. Hong Kong residents who aged over 15 years old and smoked at least 1 cigarette in a week in the past 6 months were recruited via advertisements and non-government organizations from February to December 2010. Participants completed a baseline questionnaire including psychological constructs in the ASE model including attitudes of quitting smoking, self-efficacy too resist smoking, social norm, social support of quitting, and social acceptance of smoking from family and friends, and priority of quitting. Multivariate analysis (MANOVA) was used to contrast differences of ASE constructs across the four stages of readiness to quit smoking.
Results: A total of 309 participants were recruited and 289 (93.5%) provided completed responses in ASE constructs and stage of readiness to quit. Their mean age was 27.6±12.4 years, 49.8% were male, 76.4% were married and 69.9% had education level of secondary 4-5 or above. Among them, 71.5% (n=213) were in the pre-contemplation, 7.7% (n=23) in the contemplation, 6.7% (n=20) in the preparation and 14.1% (n=42) in the action stage. MANOVA showed that there were statistically significant differences in the mean scores of social support ($F=3.140$, $p=0.026$), self-efficacy to resist smoking due to internal ($F=2.767$, $p=0.042$) and external stimuli ($F=3.258$, $p=0.022$), social acceptance of smoking by family ($F=7.506$, $p<0.001$) and friends ($F=4.316$, $p=0.005$) by stage of readiness to quit. Tukey's pair-wise comparisons showed that participants in the precontemplation stage had significantly lower mean scores than those in the action stage in self-efficacy to resist smoking due to internal (2.73±0.07 vs 3.21±0.16) and external stimuli (2.86±0.08 vs 3.41± 0.17), and reported higher acceptance of smoking than those in the preparation and action stages by family (PC:2.77±0.12, P:1.25±0.40, A:1.91±0.28) and friends (PC:3.80±0.11, P: 2.78±0.37, A:3.06±0.25).
Conclusion: The results of higher acceptance of smoking by family and friends among precontemplators highlight that social influence from smokers' living circles may play an important role in their readiness to quit smoking. While current smoking cessation programmes focus mainly on enhancing self-efficacy to resist smoking, future development in cessation interventions can also include smokers' family members and friends by stopping the smokers to smoke around them.
Acknowledgement: The study was funded by the Seed Funding for Applied Research, the University of Hong Kong to Doris Y.P. Leung.

ABSTRACTS

Abstracts Presentation (Oral):

11.

Rates of Attendance at a Smoking Cessation Clinic within a Cardiac Rehabilitation Service

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Cardiology Department, Mater Adult Hospital, Australia

Objectives: Smoking cessation has been shown to be an important intervention for preventing cardiovascular events and improving the health of patients with heart disease. However, unaided quit attempts in these patients often leads to high rates of failure and a return to smoking. Outpatient smoking cessation clinics using face-to-face counseling, ongoing behavioral support, advice on smoking pharmacotherapy and objective monitoring, have been found to be one of the most effective interventions for improving quit smoking rates. An outpatient smoking cessation clinic was trialed within a cardiac rehabilitation service in order to explore its effects on smoking rates for patients with or at risk of heart disease. Attendance rates to the clinic were also monitored.
Methods: A descriptive exploratory design was used for this newly developed clinic. Patients who currently smoked tobacco and who had a history of either coronary artery disease, heart failure, atrial fibrillation or those seen under a chest pain assessment service were invited to an outpatient 'Cardiac Patients Smokers Clinic'. Initially patients were offered up to 10 clinic visits over a 3 month period. Follow-up clinic visits were conducted at 3, 6 and 12 months. A portable carbon monoxide meter was used to objectively measure levels of smoking and validate smoking abstinence. Primary outcomes included rates of attendance.
Results: Preliminary findings showed 24 per cent of participants (N=6) completed all their clinic visits and remained smoke free as measured by their ongoing expired carbon monoxide readings. Clinic attendance rates appeared lowest for those with significant mental health issues such as schizophrenia or substance abuse. However, rates of attendance were improved by having an administration officer make reminder telephone calls prior to clinic visits.
Conclusions: Early findings indicate the feasibility of providing a specialist smoking cessation clinic within a cardiac rehabilitation service. Further, that reminder telephone calls prior to appointments improved attendance rates in patients with heart disease to this type of clinic. However, future investigations are warranted.

12.

Obesity Is a Major Risk Factor for Other Cardiovascular Risk Factors

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[1]Tehran University of Medical Sciences, Nursing and Midwifery Faculty, Ph.D. Students Department, Tehran; [2]Metabolic Diseases Research Center, Qazvin University of Medical Sciences, Qazvin, Iran

Background: Obesity is the major risk factor for cardiovascular diseases. Nevertheless, there are no studies concerning the relationship between degrees of obesity with cardiovascular risk factors among Iranian population. Objective: This study aimed to investigate the relationship between the degree of obesity and risk factors of cardiovascular diseases including hypertension, dyslipidemia, diabetes mellitus and smoking.
Methods: This is a cross-sectional and correlational study, which carried out on 1100 male and female individuals in Qazvin, a city in center of Iran, from September 2010 to February 2011. Study population was selected through a randomized cluster sampling method. Then a general physician implemented physical examination (medical history, blood pressure, BMI) using a structured interview. In addition, anthropometric characteristics and serum biochemistry tests (including FBS, GCT-2h, HDL-C, LDL-C, Cholesterol and TG) were measured as well. Data were analyzed using SPSS 19, descriptive and analytic statistics. The statistical tests were significant at $P<0.05$.
Results: Data related to BMI categories demonstrated overweight (40.9%), obesity (17.0%) and central obesity (24.8%) among studied participants. In addition, the frequency of high level LDL-C, hypercholesterolemia, hypertriglyceridemia, Diabetes, and high level of GCT-2h were measured 43.3%, 46.6%, 51.8%, 31.0%, 51.8%, respectively. Furthermore, 24% of women and 32.1% of men were in pre-hypertension stage and 8% of women and 16.1% of men had hypertension. In obese men and women, odds ratio for hypertension was 3.39 and 4.41, respectively. In addition, this ratio for women was more than men considering cholesterol disorders (men=1.95, CI=1.33 to 2.87, women=2.45, CI=1.60 to 3.75). Lastly, for diabetes, it was 2.28 and 3.73 among obese men and women, respectively.
Conclusions: In general, obesity in all levels had a significant relationship with other cardiovascular risk factors. Interventions to reduce obesity and weight regulation programs might have large effects on development of risk factors of cardiovascular diseases.

ABSTRACTS

Abstracts Presentation (Oral):

13.

Creative Fruity Venture – Finds Its Way to Promote Fruit Consumption Among Secondary Students

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Background and Objectives: The World Health Organization recommends consumption of at least five servings of fruit and vegetables daily for prevention of chronic diseases including cardiovascular diseases. In Hong Kong, only 15% of children aged 11-14 eat an adequate amount (at least 2 servings) of fruit per day. The Department of Health has been organising the "Creative Fruity Venture" (CFV) since 2010 to promote fruit eating among secondary students. CFV involved teacher-led and student-based activities in the design and implementation of fruit promotion activities. A total of 162 secondary schools with some 128,000 students joined CFV in the 2011/12 school year, and various game booth activities, fruit parties, fruit distribution occasions, cooking events and other fruit promotional activities were held. The Hong Kong College of Cardiology provided 49 schools with funding support of up to $2,000 each. A survey was conducted to assess the effectiveness of CFV.
Methods: Between 6 January and 12 June 2012, students from two randomly selected classes from 44 schools were asked to complete a set of pre-event and post-event questionnaires. Questions on fruit preference, fruit eating behaviour and school-based fruit promotional activities were included.
Results: A total of 2,779 pre-event and 2,705 post-event questionnaires were collected with response rates reaching 94% and 92% respectively. CFV promotional materials were noticed by 40% of surveyed students, with 75% finding them attractive. About half of surveyed students participated in school-based fruit promotional activities, and most reported such activities had increased their knowledge of fruit (76%), aroused their interest in fruit eating (81%) and increased their fruit consumption (62%). More students surveyed one week after the event perceived their schoolmates liked fruit (post-event 62% vs pre-event 49%; $p<0.001$) and had brought fruit from home for consumption (post-event 14% vs pre-event 7%; $p<0.001$). About 80% of students hoped to join CFV again in the next school year.
Conclusion: CFV was effective and should be considered as a regular event to promote fruit eating among secondary students.

14.

Out-Patient Cardiac Rehabilitation Program (CRP) for Patients After Left Ventricular Assisted Device (LVAD) – First Experience in Hong Kong

K FAN,[1] J NG,[2] KY CHENG,[1] KYP CHAN,[1] J LI,[2] KL LEUNG,[3] KW LAI,[1] KW SIT,[1] E WONG,[4] SL LAM,[5] RWC LI,[5] CKL HO,[5] WK AU[5]
[1]Cardiac Medical Unit, [2]Physiotherapy, [3]Occupational Therapy, [4]Dietetic Departments; Grantham Hospital; [5]Cardiothoracic Surgery Department, Queen Mary Hospital, Hong Kong

Introduction: LVAD is increasingly being accepted as mechanical circulatory support for patient with end-stage systolic heart failure as bridge-to-transplant. The newer LVAD has been established for long-term support as outpatient (outside surgical intensive setting) and the main determinant of outcome is exercise capacity. We report our first experience of setting up a multidisciplinary CRP in Hong Kong. All team members received structured training in long-term management of LVAD. Protocols were set and agreed between all teams in Grantham Hospital (GH) and Queen Mary Hospital (QMH).
Case Report: Mr T is a 51-year-old man with end-stage heart failure secondary to idiopathic dilated cardiomyopathy. He received LVAD (HeartMate II, Thoractec, USA) implantation in QMH in December 2011. Early mobilization was commenced while as in-patient during post-operative period. He started the CRP in GH in March 2012. The biweekly multidisciplinary CRP consists of aerobic exercise training on treadmill, light resistance weight lifting exercise for lower limbs muscles, dietary counseling, psychosocial support with emphasis on self management.
Outcome: The patient completed 10 sessions of gradual aerobic exercise training and 2 sessions of weight lifting exercise. The pump parameters remained stable and mean blood pressure increased slightly from 72 to 85 mmHg during exercise. From March till August 2012, the exercise tolerance improved with treadmill speed increased from 1.7 to 2.2 mph @ 0% gradient (duration increased from 10 to 20 mins). The 6-MWT was decreased slightly but did not reach significance. There was a slight increase on depression score during early phase with lower self-efficacy on emotional control with the feeling of being overwhelmed with the VAD regime responsibility. Quality of life scores improved slightly especially on physical function (from 30 to 55) with higher self-efficacy on stairs climbing (from 0 to 80). Physical active lifestyle established with optimal exercise habit (from 85 to 210 mins/week).
Conclusion: This case illustrated that a well designed multidisciplinary CRP for LVAD patients is important with improving exercise tolerance. The need for intense psychosocial support is important for the well being of the patient.

ABSTRACTS

Abstracts Presentation (Oral):

15.

Cardiac Rehabilitation Program: Beginning of a New Life Style Revamp

FCC TAM, WS CHAN, LSW LI, YY HO, KB LAM, I TAM, S WONG, R WONG, T CHU, L LAM, RHW CHAN, SWL LEE
Queen Mary Hospital, Hong Kong

Mr KLK is a 69-year old businessman and a renowned musician specialized in flute (洞簫). He has history of hypertension, hyperlipidemia and obstructive sleep apnoea. He presented in 1/2009 with acute anterior ST elevation myocardial infarction (STEMI) and given streptokinase with subsequent percutaneous coronary intervention (PCI) to left anterior descending artery (LAD) done. However, he suffered from haemopericardium and cardiac tamponade the day after PCI. The clinical course was stormy and finally he recovered and transferred to Tung Wah Hospital cardiac rehabilitation unit in 2/2009. Upon recruitment to the cardiac rehabilitation program (CRP), he had poor functional status and found difficulty to resume his work and enjoyed his leisure activity. He acknowledged the importance of stamina and cardiopulmonary fitness in playing flute which requires a lot of Valsalva maneurve. He had contemplated to give up his interest. Through 4 phases of CRP, he gradually showed improvement in clinical parameters (NYHA class, echocardiography), exercise capacity (treadmill exercise test), risk factor control (lipid profile, glucose, exercise habit) and psychological well-being (SF36 score). Now he has resumed his work as a businessman and continued to participate in various musical activities as teacher, conductor and performer. Our CRP staff was delighted to attend the Chinese instrumental concert held in Hong Kong City Hall in 4/2012.

16.

Can Participation in 4 Weeks Phase II Cardiac Rehabilitation Program (CRP) Improve Fitness and Functional Capacity?

A AHMAD
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Background: The positive effect of physical activity on coronary artery disease has long been shown, as has the positive effect of participation in 1 month Phase II Cardiac Rehabilitation Program (CRP).
Aim: The aim of this study was to ascertain the level of improvement of fitness over Phase II CRP and to see what type of patients from a fitness point of view benefited most from participation in CRP.
Method: Retrospective descriptive study from (April to July 2012), of patients who participated in 1 month (twice a week) Phase II CRP. Each patient undertakes a pre assessment which includes; physical assessment, current cardiac status, lifestyle assessment, agreed goals and 6-minute walk test (6-MWT). The 6-MWT was used in the program for both pre and post Phase II CRP. During the program, the Maximum Heart Rate method was used to calculate target heart rate and exercise prescription was set a maximum of ≤75%. The results of the 6-MWT were converted to estimated MET's for analysis.
Results: The sample number was 42, which was made up of 35 males and 7 females. Paired t-test was use for this analysis. The average age was 54.88±8.74 years. The P values between estimated MET's level achieved pre Phase II cardiac rehabilitation program, and post program was $P<0.001$ significant. Pre assessment results gave a mean 6-MWT, 432.38±85.45 meter and mean estimated MET's was 4.04±1.31. After 4 weeks of structured exercise program, the 6-MWT was 530.95±73.41 meter and mean estimated MET's was 4.64±1.29. This indicated that all of the patients for this study are still classified as sedentary (MET's ≤10 ACSM 2001). Post cardiothoracic patients showed greater improvement as compared to cardiology in their 6-MWT distance (111.9 meter, 30.6%) while only one patient do not improve.
Conclusion: Distance from 6-MWT increased significantly as a consequence of 1 month Phase II CRP in both cardiology and cardiothoracic patients. However all of the patients are classified as sedentary from a fitness point of view post Phase II CRP. Is this improvement enough to reduce risk? Is the program sufficient enough or should the setting of exercise prescription goals set higher than the current guidelines?

ABSTRACTS

Abstracts Presentation (Oral):

17.

Improvement in Exercise Tolerance in Patients with a Cutest Elevation Myocardial Infarction Received Primary Percutaneous Coronary Intervention after Cardiac Rehabilitation in Hong Kong – A Single Center Experience

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Objectives: The management of acute ST elevation myocardial infarction (STEMI) in Hong Kong is shifting from giving thrombolytic agents to performing primary percutaneous coronary intervention (PCI). However, local data concerning patients after primary PCI is sparse and we aim to evaluate the outcome after cardiac rehabilitation in this group of patients.
Methods: This is a single center, retrospective analysis. All patients suffered from STEMI with primary PCI done in Queen Mary Hospital were considered to be referred to join the cardiac rehabilitation program (CRP). Data was retrieved from the primary PCI registry and outcome parameters concerning exercise capacity such as New York Heart Association (NYHA) class, six minute walk distance and treadmill exercise test were gathered at baseline, after Phase 2 (twice weekly exercise program lasting for 8 weeks) and Phase 3 (community-based home exercise program lasting for 6 months) of the CRP.
Results: From 2006 to 2010, there were 234 STEMI patients with primary PCI performed and 158 were enrolled to the CRP. Excluding 22 patients with in-hospital death, the enrollment rate is 74.5%. After Phase 3 of the program, 67% of patients had improvement in NYHA class symptoms. For six minute walk test, the walking distance was significantly improved (Baseline: 417±112m, Phase 2: 475±114m, Phase 3: 476±111m, Baseline vs. Phase 2: $p<0.001$; Baseline vs. Phase 3: $p<0.001$). For treadmill exercise test, there were significant improvement in metabolic equivalents (METS) achieved and exercise time (Baseline: 6.7±3.2METS, 10.3±4.4 minutes; Phase 2: 9.0±3.2METS, 13.2±3.7 minutes; Phase 3: 9.1±3.4METS, 13.3± 3.7 minutes, Baseline vs. Phase 2: $p<0.001$; Baseline vs. Phase 3: $p<0.001$).
Conclusion: Cardiac rehabilitation improves symptoms and exercise capacity in patients with STEMI received primary PCI. Structured cardiac rehabilitation program should be incorporated into routine long term clinical management of this enlarging group of patients in Hong Kong.

18.

Determinants for Achieving the LDL-C Target of Lipid Control for Secondary Prevention of Cardiovascular Events in Taiwan

CC WU,[1,2] WH YIN,[3,4] JW CHEN,[5,6] ON BEHALF OF THE TAIWANESE SECONDARY PREVENTION FOR PATIENTS WITH ATHEROSCLEROTIC DISEASE (T-SPARCLE) REGISTRY INVESTIGATORS
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Background: Epidemiological and clinical studies have clearly established the link between low-density lipoprotein cholesterol (LDL-C) and atherosclerosis-related cardiovascular consequences. All treatment guidelines developed in different countries identify LDL-C as a causative factor for cardiovascular disease and as a target for lipid-lowering therapy. Although it has been a common practice for physicians to prescribe lipid-lowering therapy for patients with dyslipidemia, the achievement rate is still not satisfied in Taiwan. Therefore, the determinants for achieving the LDL-C target needed to be clarified for better healthcare of the patients with dyslipidemia.
Method: This registry-type prospective observational study enrolled the patients from 18 medical centers across Taiwan, and clinically followed them for five years. At every clinical visit, vital signs, clinical endpoints, adverse events, concurrent medications and laboratory specimens were obtained as thoroughly as possible. The lipid profile (total cholesterol, HDL-C, LDL-C, TG), liver enzymes, and creatinine phosphokinase were evaluated at baseline, and every year thereafter. The cross sectional observational data was analyzed for this report.
Result: Among the 3486 registered patients, 54% had their LDL-C <100 mg/dL. By univariate analysis, the patients achieving the LDL-C target were associated with older age, more male sex, taller height, lower blood pressure, more under lipid-lowering therapy, more smoking cessation, more history of CAD, DM, physical activity, but less history of stroke or TIA. The multivariate analysis showed statin therapy was the most significant independent determinant for achieving the treatment target, followed by age, history of CAD, DM, blood pressure, and sex.
Conclusion: Recently, 54% of the patients with CVD have achieved their LDL-C target in Taiwan, and the most significant determinant for this was statin therapy.

ABSTRACTS

Abstracts Presentation (Oral):

19.

Supervised and Individualized Exercise Training Increase the Exercise Compliance of the Patients with Myocardial Infarction

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Objectives: The present study was done to evaluate the effect of supervised and individualized exercise training over 14 days in patients of first myocardial infarction on the duration of conditioning period.
Methods: 21 patients (age 48.66±7.19 years, all males) presenting with first myocardial infarction were selected. The TMT was done 14 days after the index event and was repeated after 2 weeks after the exercise training. Six session of supervised training was done. For each patient, the grade of exercise training was set according to pre-training MET as per the ACSM guidelines. The duration of conditioning period during each session of exercise training was limited by rate of perceived exertion (Borg Scale, cut off = 13). The duration of conditioning period, maximum heart rate and maximum systolic blood pressure were noted.
Results: There was significant increase in the duration of patient limited conditioning period. This was evident at each session where the conditioning period was more than previous session. The maximum heart rate and systolic blood pressure during training did not show any change during the 6 sessions. The post training MET during TMT were significantly increased as compared to pre-training METS (10.63±1.47 vs 8.62±1.89; p=0.00005).

Exercise session	1	2	3	4	5	6
Duration of conditioning period (in min)	7.93±3.38	10.70±3.23	12.58±3.77	15.26±3.47	16.97±4.27	18.23±5.02
P value (between the consecutive sessions)		0.00001	0.0005	0.0001	0.005	0.00009

Conclusion: Each session of supervised and individualized exercise training leads to increase in the duration for conditioning period. Within 2 weeks the average increase in the duration was 10.3 minutes (2.3 times). This change was not accompanied with any decrease in the maximum heart rate or systolic blood pressure. In-hospital supervised training can be used to increase the exercise compliance of the patients as part of management of myocardial infarction.

20.

Rehabilitation Companion System for Phase III&IV Cardiac Rehabilitation

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Industrial Technology Research Institute (ITRI) has designed a rehabilitation companion system to provide cardiac patients a series of scientifically proven exercise programs (e.g., 3-minute step test and Taichi), based on use of computer gaming and motion sensor technologies. This system can automatically monitor and guide an outpatient's rehabilitation exercise, as characterized by body flexibility, muscle strength and endurance, cardiopulmonary endurance as well as other physical fitness factors. The system can also generate optimal instructional menus based on interaction with a virtual therapist. The virtual therapist can determine the accuracy of body movement by comparing the standard skeleton of the virtual therapist and the user skeleton in real-time trace, allowing for guiding patients how to adjust their body movement. Therefore, cardiac patients can perform rehabilitation exercise safely and comfortably in this home-based virtual gaming-environment that the rehabilitation companion system provides in order to increase compliance with their physicians' prescribed exercise regime.

ABSTRACTS

Abstracts Presentation (Oral):

21.

Effect of Structured Teaching Program on Nutritional Habits of Hospitalized Angina Pectoris Patients

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Introduction: Angina Pectoris (AP) in coronary heart diseases (CHD) can be prevented or reduced through modifying diet-related risk factors like serum level of cholesterol, triglyceride and glucose.
Objective: To investigate the effect of a structured teaching program on AP patients' nutritional habits in Ave-Sina teaching hospital in Qazvin, Iran.
Method and Material: In a quasi-experimental study (before-after), 21 patients between the ages 35-65 (who had been hospitalized due to unstable AP) were recruited. All participants signed an informed consent, then they participated in 30-45 minutes face to face instructional session about healthy diet and proper habits. After the session all patients were given a related pamphlet. By a questionnaire, Before teaching program and after 3 months, patients' knowledge and performance regard to healthy nutritional habits were assessed. Data was analyzed by T-test and squared Chi. Value of $P<0.05$ was considered for significant differences.
Findings: Of 21 patients; 11 (52.4%) were male and 10 (47.6%) female. The most participants (38.1%) were between 51-60 years old and low literate (56%). Sixty-six percent of patients didn't already have history of angina pectoris. Based on pretest scores, most patients' knowledge and performance was moderate (76.2%) and only 9.5% had good knowledge and performance. After 3 months most of them had good (47%) and moderate (52.4%) knowledge and performance. Analysis showed significant statistical difference between their knowledge and performance before and after structured teaching program ($P=0.000$). No significant relation was seen between knowledge and performance of patients with their demographic characteristics.
Conclusion: The results of the study confirm on the importance of structured teaching programs as one of the most important roles of health care team (particularly nurses) that is necessary to prevent and control patients' signs and symptoms.

22.

Factors Influencing Health-Related Quality of Life in Hong Kong Chinese Patients with Implantable Cardioverter Defibrillator (ICD)

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Background: Sudden cardiac death (SCD) attributed to lethal ventricular arrhythmias is one of the major causes of death in Hong Kong and worldwide. To reduce mortality in patients at risk, implantable cardioverter defibrillator (ICD) has become the favorable treatment. However, it may influence health-related quality of life (HRQOL). Factors influencing HRQOL outcomes of ICD population are still unclear. Understanding factors helps develop appropriate protocols and intervention for reducing negative factors and strengthening positive factors so as to improve current ICD patient care.
Purpose: To explore associating factors related to patients' characteristics influencing HRQOL outcomes in ICD patients
Methods: A cross-sectional correlational design was employed. A convenient sample of 139 adults with ICD implantation were recruited in the out-patient clinic at two large medical teaching hospitals in Hong Kong between from January 4 to April 30, 2012. Survey package containing demographic and clinical data form, Chinese (Hong Kong) version of SF-36, HADS, and SSQ6 were asked through face-to-face interview in outpatient clinics at two public hospitals in Hong Kong.
Results: Of 139 ICD patients, 107 (77.0%) were men and 32 (23.0%) were female. The mean age was 63.0±14.6 years ranging from 18 to 88 years. The SF-36 result revealed that physical functioning is relatively lower than mental health and social functioning although they all presented with higher score (mean >70). The associating factors including demographic factors (age, gender, living status, dependence, educational level), clinical factors heart failure (HF), hypertension (HT), atrial fibrillation (AF), diabetes mellitus (DM), ICD related factors (type, time interval, frequency of ICD implanted and ICD shock experience and psychological factors (depression, and anxiety), were significantly influencing specific HRQOL subscales. Depression was the most significant associating factors influencing all HRQOL subscales except bodily pain.
Conclusion: The findings provide evidence of various demographic, clinical, ICD related and psychological factors may influence HRQOL in Chinese ICD patients in Hong Kong. The results suggest that early screening for at-risk patients, particularly depressive patients, for initial prevention and referrals is highly desirable.

ABSTRACTS

Abstracts Presentation (Oral):

23.

Atrial Fibrillation and Early Outcomes after Mitral Valve Replacement in Patients with Rheumatic vs. Non-Rheumatic Mitral Stenosis

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Background: Atrial fibrillation (AF) is the most common arrhythmia after open heart surgery that can lead to early morbidity and mortality following operation. Mitral stenosis (MS) is a structural abnormality of the mitral valve apparatus that can result from previous rheumatic fever or non-rheumatic fever such as congenital mitral stenosis, malignant carcinoid disease and etc. This study was designed to test the hypothesis that type of mitral stenosis can affect on post-Mitral valve replacement incidence, duration and frequency of AF and early complications in patients undergoing mitral valve replacement.

Material and Method: We selected 50 patients with rheumatic mitral stenosis and 50 patients with non-rheumatic mitral stenosis candidate for mitral valve replacement surgery. Preoperative tests such as; CRP, ESR, CBC, UA, ANA, APL, ANCA, RF, IgM, IgG were performed on participant's samples and clinically suspected for determination of type of mitral stenosis, rheumatic or non rheumatic. The demographic variables and early postoperative complications such as infection, bleeding, vomiting, heart failure, renal and respiratory dysfunction, ICU and hospital stay and echocardiography findings were recorded. All patients underwent holter monitoring after being out of ICU to the time of discharge.

Results: 57 cases (57%) were male and 43 cases (43%) were female. Post operative AF occurred in 14 cases (14%); 3 cases (6%) related to non-rheumatic mitral stenosis group and 11 cases (22%) related to the rheumatic mitral stenosis group. There was a significant relationship between incidence of AF and type of mitral stenosis (p=0.02). Post-MVR bleeding was lower in rheumatic MS rather than non-rheumatic MS (p=0.4). Renal dysfunction after MVR was higher in rheumatic MS rather than non-rheumatic MS (p=0.02). There was no relationship between type of mitral stenosis (rheumatic or non-rheumatic) and early mortality after mitral valve replacement (p=0.8).

Conclusion: Our findings may show type of mitral stenosis (rheumatic or non-rheumatic MS) affect on postoperative outcomes especially incidence of atrial fibrillation and some complications after mitral valve replacement.

24.

Successful Induced Hypothermia Post-Cardiac Arrest: Evaluating Protocols to Expand Therapeutic Scope

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Objectives: Induced hypothermia (IH) improves outcomes, using stringent selection criteria. Systematic reviews demonstrating positive outcomes only included studies where cooling was initiated within 6 hours of arrest. Primarily, we evaluated our IH protocol in terms of survival and neurological outcome, comparing IH patients to matched controls. Our secondary objective was to gain insights about benefits of IH in relation to described selection criteria and protocols.

Methods: Records from consecutive cardiac arrest patients admitted to our cardiac/intensive care unit were reviewed and classified into groups IH and Control. IH was considered for patients resuscitated approximately 5-10 min after arrest, and were neurologically unresponsive Glasgow Coma Scale (GCS) 3-6, after return of spontaneous circulation (ROSC). 32-33^{o}C cooling protocol was achieved for 24 hours: iv 30 ml/kg iced saline, room temperature 15^{o}C, ventilator temperature 31^{o}C, cooling blanket, ice packs around head, axillae, and groins, room fans, neuromuscular blockade, sedation, analgesia. Patients within the IH group were then stratified into groups, including: out-of-hospital vs in-hospital arrest; witnessed vs non-witnessed arrest; initial rhythm of VF/VT or other, and time to initiate cooling (<6 vs >6 hr).

Results: 269 patients were admitted, with 249 charts available for review (IH group n=59; Control n=190). The IH group was more neurologically unresponsive at admission, arrested out-of-hospital more often, and had longer times to ROSC. Controls with GCS ≤6 (n=105) died more often than IH patients (76.2% vs 59.3%; p=0.037), yet had similar times to ROSC. Neurological outcome was poorer for the IH group, but similar after adjusting for GCS. Only 27.3% of IH patients who arrested in-hospital died, and only 51.1% died when cooling was initiated within 6 hours.

IH patients with in-hospital arrest died (27.3%) significantly less often than those IH patients arresting out-of-hospital (66.6%) and those without IH (76.2% in controls with GCS ≤6). IH patients with initial rhythms other than VF also seemed to derive benefit (65.2% vs 76.2% death in controls with GCS ≤6), while those with non-witnessed arrests had similar survival (76.9% deaths) to the controls with similar GCS.

Conclusion: IH provided survival benefit when considering patients of similar neurological status on admission. IH may benefit patients who do not meet currently recommended selection criteria.

ABSTRACTS

Abstracts Presentation (Oral):

25.

Effect of Milrinone on Short Term Outcome of Patients with Myocardial Dysfunction Undergoing Off-pump Coronary Artery Bypass Graft: A Randomized Clinical Trial

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Background and Objectives: Myocardial dysfunction is a major complication in cardiac surgery that it needs inotropic support. This study evaluates the effect of milrinone on patients with low ventricular ejection fraction undergoing off pump coronary artery bypass graft (OPCAB). The present study was designed to evaluate effect of milrinone administrated on myocardial dysfunction.
Materials and Methods: Eighty patients with Low ventricular ejection fraction (<35%), candidate for elective OP CAB, were enrolled at this study. They were randomly assigned to two groups. One group received milrione (50 µg/kg) intravenously and another group received a saline as placebo followed by 24 hours infusion of each agent (0.5 µg/kg/min). Short outcome of patients such as hemodynamic parameters and left ventricular ejection fraction were variables evaluated.
Results: Serum levels of creatine phosphokinaze, the MB isoenzyme of creatine kinaze, occurrence of arrhythmias and mean duration of mechanical ventilation were significantly lower in milrinone group (P<0.05). The mean post operative left ventricular ejection fraction was significantly higher in milrinone group (P=0.031). There were no statistically significant differences between two groups about intra-aortic balloon pump, inotropic support requirement, myocardial ischemia, myocardial infarction, duration of inotropic support, duration of intensive care unit stay, mortality and morbidity rate.
Conclusion: Administration of milrinone in patients undergoing off pump coronary artery bypass graft with low ventricular ejection fraction, is useful and effective.

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26.

The Effects of Synergy Model on Nurses' Quality Care and the Satisfaction of Patients with ACS

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Background: Despite many progresses in the improvement of care status and the management of acute coronary syndrome, cares quality is far from the desirable conditions. Today, due to the great emphasis on resources management, costs control, the effectiveness of patient care, improving quality and responsibility, the good patient care is necessary. Two dimensions are referred for improving the quality: process (standard-based and safe services) and resultant (client satisfaction). The present study, aimed at determining the impact of Synergy Model on nurses' performance and the satisfaction of the patients with acute coronary syndrome.
Methods: In a quasi-experimental study in a two-group and two-step form, a sample of 22 nurses and 64 patients with acute coronary syndrome in cardiac intensive care units of some university hospitals in 2010-2011 were recruited. Synergy Model was explained and carried out for the studied groups in a workshop and its impact on nurses performance in different areas and patients' satisfaction was examined by using two checklists: "examining the nurses' performance quality" and "examining the patients' satisfaction".
Results: Differences between the mean scores of the nurses in communicative, supportive, care and educational domains and total performance were statistically significant before and after the intervention (p<0.001). However, in therapeutic domain, changes were not significant. There was a statistically significant difference between the average satisfaction score of the two groups (p<0.001).
Conclusions: Applying Synergy Model as a basis for receiving nursing cares was effective in increasing patient satisfaction and in the performance of nurses of cardiac intensive care units (improve outcome).

ABSTRACTS

Abstracts Presentation (Oral):

27.

Fatty Liver and Blood Pressure Response During Exercise

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Background: Fatty liver (FL) is associated with insulin resistance, the metabolic syndrome, subclinical inflammation and a higher risk of cardiovascular disease. Blood pressure hyperreactivity during peak exercise is associated with an increased risk of developing hypertension and with increased cardiovascular risk. Clinical predictors of hyperreactive response (HRR) are not well established. We studied the association between fatty liver and HRR.
Methods: We evaluated 7995 consecutive non-hypertensive individuals (mean age: 41.7 years, 24.9% female) who underwent symptom limited exercise stress test, abdominal ultrasonography and extensive clinical and laboratory evaluation as part of a check-up protocol between 2006 and 2009. FL was detected by abdominal ultrasonography. HRR was defined by a systolic blood pressure higher than 220 mmHg and/or elevation of 15 mmHg or more in diastolic blood pressure. The association between FL and HRR was tested by multiple logistic regression.
Results: The prevalence of FL was 28.4% (n=2270). Overall, 7% (n=559) of the study population presented HRR. Subjects with FL showed a higher prevalence of HRR than those without FL (12.7% vs. 4.7%, OR 2.14, 95% CI 1.78 to 2.56, p<0.001). Other variables associated with HRR were: Body Mass Index (BMI)>25 kg/m^2 (OR 2.49, 95% CI 2.01 to 3.08, p<0.001); fasting glucose >100 mg/dL (OR 1.69, CI 95% 1.34 to 2.14, p<0.001); C-reactive protein >2 mg/L (OR 1.40, 95% CI 1.15 to 1.70, p=0.001); and low HDL-cholesterol levels (OR 1.22, 95% CI 1.02 to 1.46, p=0.034). After adjustment for these variables as well as baseline blood pressure, only FL (OR 1.37, 95% CI 1.12 to 1.67, p=0.002) and BMI> 25 kg/m^2 (OR 1.41 95% CI 1.12 to 1.67, p=0.002) remained statistically significant predictors of HRR.
Conclusions: FL is an independent predictor of HRR. This association may partially explain the increased cardiovascular risk observed in FL.

28.

Blood Pressure Hyper-Reactivity during Exercise is related to the Degree of Hepatic Steatosis

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Objectives: Recently, hepatic steatosis (HS) has been identified as a major independent predictor of blood pressure hyper-reactivity on the exercise test. However, whether this association is homogeneous or if it varies depending on the degree of HS is still to bee defined. The purpose of this study was to stratify the incidence of blood pressure hyper-reactivity by the degree of HS evaluated by abdominal ultrasonography.
Methods: We evaluated 11,941 consecutive asymptomatic subjects who underwent exercise stress test, abdominal ultrasonography and extensive clinical and laboratory evaluation between 2010 and 2011. Those without HS (N=7.795) and those with not adequately quantified HS (N=2.541) were excluded. HS was classified into three degrees (mild, moderate and severe) in accordance with conventional ultrasound parameters. Blood pressure hyper-reactivity was defined by a systolic blood pressure higher than 220 mmHg and / or elevation of 15 mmHg or more in diastolic blood pressure. The association between HS degree and blood pressure hyper-reactivity was tested by multiple logistic regression.
Results: HS prevalence was 34,7% (N=4.146). HS was adequately quantified in 1.605 (average age: 42 years, 6.8% female): 1.120 (69.8%) were classified as mild steatosis; 296 (18.4%) as moderate steatosis; and 189 (11.8%) as severe steatosis. Overall incidence of blood pressure hyper-reactivity in individuals with HS was 7.2%. When evaluated according to the degree of HS, incidence of blood pressure hyper-reactivity was 5.6% (N = 63) in mild steatosis subjects; 7.1% (N=21) in moderate steatosis subjects; and 16.9% (N=32) in severe steatosis subjects. The association between blood pressure hyper-reactivity and the degree of HS was statistically significant (p<0.001). Final multivariate model showed severe steatosis as the strongest independent predictor of blood pressure hyper-reactivity (OR 2.4, CI 1.44 to 3.98, p<0.001).
Conclusions: Blood pressure hyper-reactivity during exercise is related to the degree of HS. Despite the known ultrasound limitations in HS assessment, routine HS quantification can bring relevant information about individual cardiovascular risk.

ABSTRACTS

Abstracts Presentation (Oral):

29.

Relationship of Serum High Sensitivity C-reactive protein to Metabolic Syndrome-Bulgarian Prospective Study

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Obectives: High levels of hs-CRP in the context of the presence of the The Mets justify a significantly higher risk of cardiovascular events and predict with great accuracy the onset of insulin resistance. In clinical practice we can use the hs-CRP concentrations as a like certainly mark for determine cardiovascular complications.

Methods: Subjects were 500 Bulgarian clinical healthy participants from Pleven region (201 males and 299 females). A subset of individuals with Mets was selected. Anthropometric and hematologic indexes were defined. Have been used: statistical test of Mann-Witney test and Kruskall-Wallis test for quantitative variables with nonparametric distribution, correlation and regression analysis.

Results: The metabolic syndrome frequency among the study population was as follows: age of 35 years are found in 13% of women and 18% men, 36 to 45 years old – 19% of women and 45% men and 46 years old – in 40% of women and 30% men. An ANOVA statistical analysis to determine the differences in hs-CRP in subjects with and without the metabolis syndrome. The moderate increase of hs-CRP concentration among men is related with 2.41- fold increase of the risk for metabolic syndrome (OR=2.41, 95% CI: 1.36-4.33). The moderate increased of hs-CRP concentration among women is associated with 5.03- fold increase of risk for metabolic syndrome (OR= 5.03, 95% CI: 2.23-11.13).

Conclusion: The aim of our study was to clarify the existence of a link between the level of hs-CRP and components of the Mets. We found that serum levels of hs-CRP were positively associated with obesity in men without Mets. There is a positive and significant relationship of obesity to the levels of hs-CRP in women with and without Mets. In men with a modest Mets Rights correlation (r=0,31÷0,5) between hs-CRP and waist circumference, BMI, LDL-cholesterol, blood glucose, and LDL / HDL. In women with moderate Mets notes straight correlation (r=0,28÷0,52) between hs-CRP and body weight, waist circumference and BMI.The risk of metabolic syndrome increases with the level of hs-CRP, and this relationship is more pronounced in women.

30.

Obesity in Egyptian Children: Effect on Cardiac Function and Dimensions

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Background: Obesity is an increasingly common condition in industrialized and developing countries, affecting both adults and children and increasing the social burden due to incident cardiovascular disease. Numerous studies suggested that obesity and increased Body Mass Index are risk factors for left ventricular hypertrophy which is proved to be independent risk factor for cardiovascular morbidity and mortality.

Objectives: This study proposed to define the effect of obesity in Egyptian children on cardiac function and dimensions also to investigate the possible relation between obesity and other co-morbid cardiovascular risk factors.

Methods: The current study is a prospective descriptive study conducted from January 2009 to March 2010 and included 44 children with exogenous (simple) obesity aged from 4 to 16 years with a mean of 8.54±2.4 years in addition to a healthy normal weight, matched age and sex 35 children as a control group. All study groups underwent clinical examination, lipid profile in addition to meticulous echocardiography study with special concern to measurement of wall thickness, mass, mass index, Ejection fraction, Fractional shortening, isovolumetric relaxation time, E/A and myocardial performance index.

Results: Our results revealed that blood pressure was comparable in both groups and mean serum triglyceride level (though in the normal level) was significantly higher in the obese group with P =0.035. Also left ventricular wall thickness, mass and mass index were significantly higher in obese group compared to normal weight group with P value 0.001, 0.045 & 0.035 respectively. Myocardial systolic function was comparable in both groups but diastolic function presented by isovolumetric relaxation time and E/A was significantly different in favor for the control group. We also observed a significant positive linear relationship between body mass index and both left ventricular thickness and left ventricular mass. However by correlating cardiac dimension with the lipid profile no significant relation could be elicited.

Conclusions: Our data showed that obesity in the absence of dyslipidemia and hypertension (as co-morbid cardiovascular risk factors) is associated with increased left ventricular wall thickness and mass also it is a risk factor for left ventricle diastolic dysfunction

ABSTRACTS

Abstracts Presentation (Oral):

31.

Sampurna Hriday Shudhikaran (SHS): A Novel Noninvasive Herbal Procedure to Improve Effort Tolerance in Chronic Heart Failure

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Objective: Heart disease is a worldwide problem affecting people in all communities. India will bear 60% of the world's heart disease burden in the next two years and the average age of patients with heart disease is lower among Indian people who belong to the economically productive group. It is not only the lack of resources but also the inability to continue with the costly treatment that further adds to the woes of the patients. Inadequate pumping of heart leads to chronic heart failure which causes effort intolerance. Conditions like coronary artery disease, hypertension, post myocardial infarction, Cardiomyopathy, heart valve disease ultimately leads to CHF. Present study was carried out to evaluate the effect of the *Sampurna Hriday Shuddhikaran* (SHS) model in improving the exercise tolerance capacity of chronic heart failure patients.

Methods: Novel noninvasive interventional health model **Sampurna Hriday Shuddhikaran (SHS)** procedure was used to treat CHF patients at Madhavbaug Cardiac Rehabilitation Centre, Mumbai (INDIA). SHS combines the 4 pronged interventions of Snehan (oil massage to reduce vascular tone), Swedan & Hrid Dhara (thermal therapy to reduce salt & water retention and causing vasodilatation) and Basti (rectal herb to increase cardiac contractility) was used in each patient who received twice daily sessions of 90 mins each for 6 consecutive days. Symptomatic patients (age 17-80 years) with CHF (Grade 1-3 of NYHA classification), of either gender, with ejection fraction more than 25% & provided written informed consent were included in study. Patients with history of Myocardial infarction in last 2 weeks, uncontrollable hypertension (SBP ≥180 & DBP ≥110 mmHg), severe hepatic/renal insufficiency, pregnancy/lactating were excluded. Evaluation parameters used were – Exercise Tolerance capacity [as measured by standard 6 minute walk test (6MWT); Improvement in Stress test (ST)]; Improvement in Grade of Symptoms (GOS); Improvement in maximum oxygen uptake (VO_2max) & Improvement in metabolic equivalents (METs), which were taken on day 1 (pre-intervention) and on day 7 (post-intervention).

Results: A total of 1200 patients were evaluated. Mean age=55±9 years; Mean BMI=24.5±3.4 kg/msq; Preexisting Diabetes Mellitus on treatment=40%; Past history of coronary angiography/bypass=7%. The mean improvement in exercise tolerance as measured by in 6MWT & ST post- intervention was 70.6 meters/6 mins & 132.1±85.4 seconds/9 mins (p=0.03) respectively. The corresponding improvement in VO_2max & METs was 3.1±3.44 lt/min & 2.23±1.9. Patient symptoms also improved. Vital parameters were stable. No significant adverse events were seen in any patient.

Conclusions: Novel noninvasive Sampurna Hriday Shudhikaran procedure was effective in improving the exercise tolerance & oxygen uptake in symptomatic chronic heart failure patients and this improvement was independent of age, gender and BMI.

ABSTRACTS

Abstracts Presentation (Poster):

1.

Associations between Muscle Fitness in Extremity and Trunk with Metabolic Syndrome

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Objectives: We studied the associations of muscular fitness in extremity and trunk with metabolic syndrome (MS) in adult men and women, because such data are limited and demanded in management of MS.
Methods: We studied a population sample of 1743 men and 834 women aged 20-77 years, having not any medical history of chronic diseases and musculoskeletal problems, from the 2001-2006 database of a health examination center. Muscular fitness included hand and leg dynamometers for maximal grip force and functional leg strength, one-minute curl up test for abdominal muscle endurance. Possible confounding variables, such as age, sex, and weight were also extracted for adjustment. Based on the criteria of MS, subjects with a cluster of three or more metabolic abnormalies were classified as having the MS.
Results: Both male and female adults with MS (n=561) had significantly weaker extremity muscle fitness (grip, leg force) and abdominal muscle endurance than subjects without MS (n=2016) after age and weight adjustment. The ratio of abdominal endurance to grip force was also significantly lower among adult men with MS. Men in the poor rank of grip, leg force and abdominal endurance had 1.51-, 1.44- and 1.37-fold higher risks ($p<0.05$) of MS than those in the good and excellent rank of each muscular fitness after adjustment. But such associations in adult women with the similar level of risks were not significantly.
Conclusion: Low muscular fitness in both extremity and abdominal muscles is associated with metabolic syndrome in adult men and women. Furthermore, a lower ratio of abdominal endurance to grip force in adult men with metabolic syndrome suggests the decrease in abdominal muscle fitness being dominant in reflecting risk of metabolic syndrome.
The grant is supported by Incubated project of National Yang Ming University (96A-D-D128) and partly from the National Science Council (NSC-99-2627-B-002-018).

2.

Impact of Cardiac Rehabilitation Nurse in a Multi-Disciplinary Cardiology Clinic on Patient Recruitment

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Objectives: Cardiac Rehabilitation Program (CRP) is a multi-disciplinary program that has been shown to lower patients' risk of future cardiovascular events and mortality. It improves functional capacity, psychological well-being, quality of life and cardiac risk factors (lipid profiles and obesity indices). Patients are usually introduced to CRP during hospitalization for an acute cardiac event or after undergoing coronary revascularisation. Although the benefits of CRP are plentiful, the rate of participation is generally low. It is unclear whether introduction of CRP to patients in different clinical settings (in-hospital versus outpatient) would influence their decision to participate. We examined whether involving CRP nurse as the first point of contact post discharge in a multi-disciplinary cardiology clinic would have an impact on patient recruitment for CRP.
Methods: From January 2011 to May 2012, 932 eligible patients who had received percutaneous coronary intervention (PCI) at our institution were introduced to CRP. For the first group (Group A), 546 patients were introduced to CRP during hospitalization. Patients were given the necessary education/counseling and were given the option of attending CRP before discharge. For the second group (Group B), 386 patients were introduced to CRP in a newly formed, multi-disciplinary cardiology clinic (since October 2011) with the CRP nurse being the first point of contact. Patients were seen 2 weeks after discharge from hospital. For both groups, CRP appointment was arranged immediately after patient had consented.
Results: Study groups did not differ significantly at baseline. For Group A, 290 (53.1%) patients agreed to participate in CRP versus 311 (80.6%) patients in Group B ($p<0.001$). In addition, 217 (74.8%) patients from Group A showed up for their CRP appointment versus 274 (88.1%) patients in Group B ($p< 0.001$).
Conclusion: The involvement of CRP nurse in a multi-disciplinary cardiology clinic has a significant impact on patient recruitment as demonstrated by a higher sign-up and show-up rate for CRP. Early introduction of CRP to patients in the outpatient setting after hospital discharge could be considered as an alternative method to boost patient participation in CRP.

ABSTRACTS

Abstracts Presentation (Poster):

3.

Adherence to Cardiac Risk Factor Modification Behaviors and Problem Solving Skills in Cardiac Rehabilitation Patients

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Problem solving skills have been shown to be an important component of the behavior change process. Guided by the Social Problem Solving Model of Ewart (1989), the purpose of this study was to determine the relationship between problem solving skills and adherence to cardiac risk factor modification behaviors of diet regimen, medication regimen and stress management in cardiac rehabilitation patients. Measures of problem solving and adherence behaviors were taken in a convenience sample of 99 Phase II cardiac rehabilitation patients (66 males and 33 females) with myocardial infarction, coronary artery bypass or angioplasty who ranged in age from 38 to 85 years (M=63, SD=11.5). Problem solving skills were measured using the Problem Solving Inventory (Heppner 1988). Adherence to cardiac risk factor modification behaviors was measured using the Health Behavior Scale (Miller Wikoff, McMahon, Garrett, & Gohnson, 1982, 1990). Data were collected in face-to-face interviews during the 6th week of cardiac rehabilitation. Results showed significant relationships between problem solving skills and adherence to prescribed diet (r=-0.296, p=0.003) and stress management (r=-0.254, p=0.011). No significant relationships were found between problem solving skills and adherence to medication regimen. No difference in problem solving skills or adherence behaviors were found between men and women and neither problem solving skills nor adherence behaviors varied by age or co-morbidity (measured by Charlson Scale, 1987). These findings suggest that interventions to increase patient problem solving skills may be helpful to improve cardiac patients' adherence to diet and stress management. The finding that problem solving was not related to adherence to medical regimen may be because adherence to a medical regimen is influenced by several factors unrelated to problem solving, such as severity of side effects or number of medications.

4.

Validation of Incentive Spirometry for the Lung Function Recovery of Post-Cardiac Surgery Patients

HY TSAI, LY KUO, BY CHEN, MW TSAI, HY HUANG, JC CHEN, CL HSU, YS LIN, WN CHEN, FH CHENG, CY CHEN
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Objectives: The aims of this study were using the incentive spirometry (IS) to predict the recovery of lung function and to evaluate its responsiveness as a tool in assessing lung function in patients underwent cardiac surgery.
Methods: This was a prospective cohort study. A total of 112 subjects (25% female, aged 62.4±10.8 years old) underwent cardiac surgery were recruited. Spirometry and IS were used to assess the lung function at admission (preoperatively) and at discharge (postoperatively). To test criterion validity, we used Pearson's correlation coefficient to analyse the correlation between volume readings of IS and forced vital capacity (FVC). Patients whose %pred FVC improved from admission were categorized as lung function recovery group (n=31), otherwise as non-recovery group (n=81). To test the responsiveness of IS, we compared the ratio of $IS_{discharge}$ / IS_{preop} volume readings between recovery and non-recovey groups. Receiver operating characteristic (ROC) curve analysis was also used to identify the optimal cut-off point of ISdischarge / IS_{preop} ratio in predicting the recovery of lung function.
Results: Our results showed that the volume of IS at admission and discharge were 1932.6±600.7 mL and 1789.3±573.8 mL ($p<0.05$). And, IS performance significantly correlated to FVC at both admission and discharge (r=0.71 and 0.76. $p<0.001$). The ratio of ISdischarge / ISpreop was significantly different between recovery (101.3±20.5) and non-recovey (91.5±21.3) groups ($p<0.05$). The optimal cut-off point of IS ratio was 93%, with sensitivity of 62% and specificity of 68% (AUC =0.65 (95% CI: 0.53 to 0.76).
Conclusions: There was a high correlation between lung volume measures with spirometry and incentive spirometry for patients underwent cardiac surgery. The postoperative relative to the preoperative IS volume could respond the patients with poor lung function recovery after cardiac surgery. Our findings suggest that the incentive spirometry can be used not only as a breathing training tool but also as a valid and low-cost tool to assess lung function in the bedside care.

ABSTRACTS

Abstracts Presentation (Poster):

5.

The Effects of Core Muscle Exercise and Aerobic Exercise Training on Respiratory Efficiency in Patients Underwent Cardiac Surgery

JC CHEN,[1] CL HSU,[1] FH CHENG,[1] MW TSAI,[2] HY HUANG,[1] LY KUO,[1] CY CHEN,[1] BY CHEN,[1] YS LIN,[1] HY TSAI,[1] WN CHEN[1]
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Objective: To examine the effect of core muscle exercise and aerobic exercise on respiratory efficiency in patients underwent cardiac surgery.
Methods: 37 patients who underwent cardiac surgery in a heart center of general hospital were inrolled during 2011. They were classified to exercise group (n=23, 30% female and 63.77±11.58 years) and control group (n= 14, 29% female and 61.73±10.77 years). Patients in the exercise group participated a 30 to 40-minute aerobic training and a 50-minute core muscle training mat exercise which was based on Pilates elements for 3 months. The control group were received uaual medical care. Outcomes measured including of forced vital capacity (FVC), forced expiatory volume in one second (FEV1), peak inspiration flow (PIF), peak expiration flow (PEF), and respiratroy efficiency of the minute ventilation-carbon dioxide production relationship (VE/VCO2 slope) from pulmonary function test and cardiopulmonary exercise test at the baseline and after 3 months intervention. Independent-T test, chi-square test, and paired-T test were used to examine the effect of the intervention.
Results: Both exercise and control group had significant improvements of FVC and FEV1 ($p<0.05$) after 3 months. There were significant improvements of PIF (from 2.49±1.31 to 3.25±1.65 L/min, $p=0.007$) and VE/VCO2 slope (from 35.95±7.46 to 27.6±4.71, $p<0.00$) in exercise group after 3 months, but not in control group (PIF from 3.00±2.11 to 3.57±1.45 L/min, and VE/VCO2 slope from 31.05±5.46 to 28.33±4.11).
Conclusions: A core muscle exercise and aerobic exercise training improve the respiratory efficiency on patients underwent cardiac surgery. Our findings suggest that combined core muscle exercise and aerobic exercise training can have great effects at the clinical implication.

6.

An Evaluation on a Structured Health Qi-Gong (Baduanjin) Program for Patients with Cardiac Diseases in Cardiac Rehabilitation Program

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Objectives: Health Qi-Gong is a culturally relevant health maintenance activity to Chinese people. Numerous studies found that it has positive influence towards health conditions. Recently, the practice of Health Qi-Gong is used by occupational therapists as a complementary program in different chronic diseases management, including cardiac diseases. Patients with cardiac diseases face not only physical problems but often also suffering from long term psychological turmoil. Occupational therapist in the Cardiac Rehabilitation and Resource Centre (CRRC) of Tung Wah Eastern Hospital had started using Health Qi-Gong – Baduanjin (八段錦) since July 2010 in Phase II Cardiac Rehabilitation Program to enhance the service quality. This study aimed to examine whether the practice of Baduanjin could promote the physical and psychological functions of patients with cardiac diseases.
Methods: Through purposive sampling, a total of 19 cardiac patients (mean age 63.9) with blood pressure problem and/or psychological problems were enrolled into the HQG classes and assigned into group A or B. Patients in group A (n=11) would attend 4 weekly 75 minutes sessions in CRRC to learn the Baduanjin. Patients in group B (n=8) would have additional 8 weekly practice sessions with each duration 30 minutes in the center after the 4 weekly sessions learning the Baduanjin. Both groups were encouraged to practice at home daily from 0 week to 12th week. Individual lifestyle counseling would be offered to both groups of patients who had difficulty to integrate the practice of HQG in daily life. Assessments on physical parameters including systolic and diastolic blood pressure; and heart rate were conducted at baseline, 4th week and 12th week, while the psychological parameters using Hospital Anxiety and Depression Scale and the generic quality of life measure using WHO-5 were assessed at baseline and 12th week.
Results: All 19 patients in either group A or B had positive changes in the mean difference of all physical and psychological parameters after attending the HQG class. The results did not show significant differences in any parameters between group A and B despite more weekly practice sessions were provided in group B. However, when data of patients with good and poor compliance to daily life practice were extracted and grouped together for analysis, statistical significant improvement were found in those patients with good compliance in systolic blood pressure ($p=0.01$), anxiety ($p=0.04$) and depression ($p=0.01$). In addition, all patients with good compliance to daily practice showed normalized systolic blood pressure after practicing Baduanjin. This HQG program also received positive and encouraging feedbacks from patients and most of them agreed that Baduanjin could help to enhance their general health.
Conclusion: The study showed that the Baduanjin is well accepted and suitable for patients with cardiac diseases. It also pointed out that compliance to daily life practice was one of the key success factors to achieve a better health. Thus, through developing a habit to practice Health Qi-Gong regularly, it could be beneficial in improving both physical and psychological functions as well as the quality of life of patients.

ABSTRACTS

Abstracts Presentation (Poster):

7.

Psychological Outcome of Cardiac Rehabilitation Programme Among D.A.S.S. Positive Patients Enrolled in Hospital Serdang

MY SAARI,[1] A ATIKAH,[1] I ZURIANTI,[1] J ROHANA,[1] NA HARRIS,[2] KZ ATHIRAH,[2] N ASIYAH,[2] AN NURUL,[2] A SAKINAH[2]

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Objective: To measure psychological outcome of cardiac rehabilitation programme among D.A.S.S. (Depression Anxiety Stress Scalespositive) enrolled in Hospital Serdang.

Method: A retrospective cohort study design, whereby a collection data was obtained from recorded notes of the participants of cardiac rehabilitation who had completed phase 3 medical surveillance.

Result: Fifteen (20.83%) out of 72 participants were psychologically distress based on DASS at initial evaluation of CRP and upon completion there is 60% significant overall improvement noted (Z=-2.196, P=0.013). Further analysis also done on individual components of DASS (i.e. depression, anxiety and stress) and we found that only anxiety modelled a statistical significant improvement of severity after completion of CRP (Z=-2.127, P=0.033). However, individual phases of CRP failed to give an impact independently (P>0.05).

Conclusion: This study has shown that CRP did have an impact on psychological status of participants if complete adherence and compliance is meeting. Hence, the findings of this research should be used to further emphasize the need of clinical preventive medicines such as CRP integrated in the treatment equation of cardiac patients.

8.

Difference of Blood Pressure Response during Exercise in Normal Subjects and Patients with Myocardial Infarction

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Objectives: Exercise prescription for people with cardiovascular disease has been well established for years. Whereas, there is few literature discuss about the systolic blood pressure response during maximal graded exercise tests (GXTs) in patients after myocardial infarction (MI) event. By performing maximal GXTs, our study investigated the difference of SBP response between normal subjects and post-MI patients.

Methods: We retrospectively review patients with MI who went through maximal GXTs in our medical center from 2009 July to 2011 January. Normal subjects were students randomly chosen from university. Same as the V̇O2 reserve (V̇O2R) method, we then distribute the SBP recorded during maximal GXTs into percentile rank as maximal SBP becomes 100% and resting SBP as 0% (SBP reserve method, as SBPR). A regression model were established with SBPR as a dependent variable and V̇O2R as an independent variable. We also divide the patient into smaller groups by hypertension drugs they use (angiotensin-converting-enzyme inhibitor (ACEI), Alpha Blocker, Beta blocker, Calcium Channel blocker (CCB), Diuretic, None) and further analyze to see if drugs might affect SBP respond during exercise.

Results: 43 post-MI patients and 35 college students with no systemic disease were involved in this study. The results of the regression model showed that V̇O2R is predictive of SBPR in both groups (MI group: F=211.097, p<0.001; B=0.802, p<0.001; R-squared=0.667, p<0.001, Normal group: F=2491.941, p<0.001; B=0.967, p<0.001; R-squared=0.827, p<0.001). Also, the Beta value in each drug groups are all lower than the normal group (ACEI: 0.771, Alpha Blocker: 0.759, Beta Blocker: 0.81, CCB: 0.739, Diuretics: 0.762, None: 0.851).

Conclusion: From the slope of the linear regression line between SBPR and V̇O2R, SBP respond more slowly in post-MI group when compared with the normal population, with or without hypertension drugs use.

ABSTRACTS

Abstracts Presentation (Poster):

9.

Systolic Blood Pressure Reserve in Exercise Intensity Prescription of Post-Myocardial-Infarction Patients with Arrhythmia

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Objectives: V̇O2 reserve (V̇O2R) method reflect the rate of energy expenditure during physical activity more accurately than the other exercise intensity prescription methods. For practical reason, Heart rate reserve (HRR) and rate of perceived exertion (RPE) are the most common used method for quantification of exercise intensity. However, in patients with arrhythmia, there is no feasibly quantified method as HRR can be used. Our study is to investigate whether systolic blood pressure reserve (SBPR) method can be used in arrhythmic patients when prescribing exercise intensity.
Materials and Methods: We retrospectively review patients who went through maximal graded exercise testing in our medical center from 2009 July to 2011 January. Twenty-seven patients with arrhythmia were selected. SBP during the exercise is recorded with the corresponding V̇O2 value. Same as the V̇O2 reserve method, we then distribute the SBP into percentile rank, as maximal SBP becomes 100% and resting SBP as 0%. A regression model were established with SBPR as a dependent variable and V̇O2R as an independent variable.
Results: The study population consisted of 27 post-myocardial-infarction (post-MI), arrhythmic patients with mean age of 55.67±13.35 years; height: 166.74±7.41 cm and weight: 70.24±16.18 kg. Of the treatment they received after MI event, 5 of them had percutaneous transluminal coronary angioplasty, 7 had coronary artery bypass graft, 10 had valve repair, and 1 have aortic aneurysm repair. The results of the regression model showed that V̇O2R is predictive of SBPR ($F=117.792$, $p<0.001$; $B=0.7656$, $p<0.001$). Besides, V̇O2R was found to account for 61% of variance in SBPR ($r^2=0.614$, $p<0.001$).
Conclusions: When prescribing exercise intensity in post-MI patients with arrhythmia, SBPR has good correlation with V̇O2R and can serve as a better quantification method in practical use.

10.

Patient Dignity and Its Related Factors in Heart Failure Patients

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Introduction: Maintenance and promotion of patient dignity is an ethical responsibility of health care workers. The aim of this study was to investigate the patient dignity and related factors in heart failure patients.
Materials: In this qualitative study, 22 patients with heart failure were chosen by purposive sampling and Semi-structured interviews were conducted until data saturation.
Results: Factors related to patient dignity were divided into two main categories: patient/care index and resources. Intrapersonal features (inherent characteristics and individual beliefs) and interpersonal interactions (communication, respect, enough information, privacy and authority) were classified as components of the patient/care index category. Human resources (management and staff) and environmental resources (facilities and physical space) were classified as components of resources category.
Conclusion: The results will increase the understanding of healthcare staff regarding patient dignity and its relevant factors, and provide information regarding the development of systems and processes that support patients in ways consistent with these values.

ABSTRACTS

Abstracts Presentation (Poster):

11.

Pedometer as Adjunctive Therapy to Cardiac Rehabilitation Program: A Feasibility Study

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Objectives: The prevalence of sedentary lifestyle is elevated after acute coronary syndrome (ACS). Recent studies have shown that a physical activity target of 7500-10,000 steps a day is a realistic goal for patients with ACS and can help them reduce their burden of cardiovascular risk factors. Pedometers have become popular tools for setting fitness goals and we studied the feasibility of including pedometers as adjunctive therapy in ACS patients undergoing cardiac rehabilitation program (CRP).
Methods: From June to July 2012, 8 eligible patients (7 male, mean age of 63.8±6.3 years) were introduced to the use of pedometer as adjunctive therapy (Group A) to CRP at our institution. They were instructed to achieve a set goal of at least 7500 steps per day. Serial assessment at baseline and at the end of CRP included body mass index (BMI), waist to hip ratio and exercise capacity (6 minute walk test). Nine other patients were identified and matched as a control group (Group B).
Results: At baseline, there was no significant difference in demographic data, risk factor profiles and mean ejection fraction between both groups. After 6 weeks, there was no significant change in the BMI and exercise capacity between both groups. However, there was a trend towards a much lower waist-to-hip ratio (-3%; p=0.08) for Group A patients when compared to Group B patients.
Conclusion: Our preliminary experiences showed that the use of pedometers as adjunctive therapy to CRP is feasible and may have a beneficial effect on the waistline. It may potentially be used as a motivational tool for physical activity behaviour. Further studies in a larger patient population is necessary to validate and expand its role in CRP.

12.

Effects of Rosuvastatin and Atorvastatin on Coronary Artery Disease Patients After Stent

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Objectives: To observe the effects of rosuvastatin and atorvastatin on coronary artery disease patients after coronary stent.
Methods: 138 patients were randomized to Group A (n=68), atorvastatin 20 mg/d and Group B (n=70), rosuvastatin 10 mg/d, both groups were treated for 2 years. The levels of TC (Total Cholesterol), LDL-C (Low-Density Lipoprotein Cholesterol, TG (Total Glycerin), HDL-C (High-Density Lipoprotein Cholesterol), hs-CRP (high-sensitivity C-reactive protein) and cardiovascular events were observed after treatments.
Results: After 2 years treatments, TC, LDL-C, TG, hs-CRP in group A were decreased [(5.92±0.93) mmol/L to (4.13±0.70) mmol/L, (3.69±0.62) mmol/L to (2.51±0.46) mmol/L, (2.87±0.79) mmol/L to (2.32±0.65) mmol/L (5.86± 1.84) mg/L to (2.27±0.97) mg/L, all P<0.01], TC, LDL-C, TG, hs-CRP in group B were decreased [(5.94±0.92) mmol/L to (3.89±0.75) mmol/L, (3.71±0.61) mmol/L to (2.08±0.45) mmol/L, (2.87±0.79) mmol/L to (2.30± 0.62) mmol/L, (5.84±1.88) mg/L to (2.14±0.99) mg/L, all P<0.01], between two groups,differences were found in TC levels (P<0.05), significant differences were found in LDL-C levels (P<0.01), no differences were found in TG and hs-CRP levels (P=0.39, P=0.18); HDL-C in group A were increased [(0.85±0.19) mmol/L to (0.87±0.16) mmol/L, P=0.53], HDL-C in group B were increased [(0.87±0.24 mmol/L to (0.97±0.18) mmol/L, P<0.01], between two groups, significant differences were found in HDL-C levels (P<0.01); 32 patients in group A were rehospitalization because unstable angina pectoris after coronary stent (47.06%), 22 patients in group B were rehospitalization because unstable angina pectoris after coronary stent (31.43%),cardiovascular events were no differences between two groups (P=0.174).
Conclusion: The efficacy of rosuvastatin in reducing TC, LDL-C and in increasing HDL-C excelled atorvastatin; the patients in group B have little cardiovascular events than group A.

ABSTRACTS

Abstracts Presentation (Poster):

13.

Systolic Blood Pressure Recovery after Graded Exercise Test: Left Ventricular Ejection Fraction and Medication

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Objectives: Our study is to investigate the relations between delayed blood pressure recovery response after graded exercise test and left ventricular ejection fraction (LVEF) in the cardiovascular disease (CAD) patients. We also discuss the relationship between blood pressure recovery and their cardiovascular medications.
Methods: Subjects received graded exercise test and measured blood pressure via mercury sphygmomanometer. We measured blood pressure at the timing of exercise peak, one minute after exercise peak, two minutes after exercise peak, and three minutes after exercise peak, respectively. If subjects' 3 min after peak to peak systolic blood pressure ratio was greater or equal to 0.93, we defined them as "delayed recovery response". Then, we compared the ejection fraction of left ventricle and medication between two groups. SPSS version 15.0 for windows was used for statistical analyses. Categorical variables were compared using either chi-square or Fisher exact test as appropriate. Continuous variables such were compared using either independent t test. A p value less than 0.05 were determined as significant.
Results: 153 CAD patients referred from cardiologist or cardiac surgeons in our hospital were assessed. Exclusion criteria include heart transplant receiver, no sufficient data, and no cardiac echogram in our medical records. Then total 55 patients were included in our study. Delayed recovery group had poorer LVEF (44.68±19.92 vs.63.22±15.27, $p<0.001$). There are no differences of age, gender, α or β blocker use, comorbidities between two groups.
Conclusions: Previous study had showed that delayed recovery response is the predictors of more severe CAD, high risk of stroke and cardiac infarction in normal population. In our study, only CAD patients were included and we found that delayed recovery response was associated with poorer LVEF despite of α or β blocker use.

14.

Quality Assurance of Cardiopulmonary Exercise Testing: Experience in Taiwan

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Purpose: In recent years, findings of cardiopulmonary exercise testing have been widely used in clinical diagnosis, assessment of treatment outcome, prognosis prediction, exercise prescription and research purposes. However, the testing equipment, calibration procedures, testing personnel, exercise protocols, and results interpretation are different among hospitals in Taiwan. The purpose of this study is to provide a quality assurance protocol for measurement of oxygen uptake that can be utilized to reduce technical and operational variability, and to validate this protocol.
Materials and Methods: From September 2009 to January 2011, forty healthy men who received CPET in National Taiwan University Hospital were assessed retrospectively. These forty men were 20-60 years of age, with a body mass index between 19 and 25, and tested using ramp protocol of 20 watt/min increment. The values of oxygen uptake were collected at 20, 40, 60, 80, 100, and 120 watt as reference values for quality assurance protocol. We invited five hospitals for validation of the reference values. Each hospital collected the oxygen uptake values of two healthy volunteers who were conforming to the same inclusion criteria.
Results: The oxygen uptake reference values at 20, 40, 60, 80, 100, and 120 watt were 9.44±1.27, 11.25±1.41, 14.12±1.88, 16.83±1.84, 20.02±2.47, and 23.00±3.15 mL/kg/min. The oxygen uptake data from cardiopulmonary exercise testing in the invited hospitals were all within two standard deviations of mean from reference values except for one hospital. After thorough equipment calibration and replacement of the sampling tube, the oxygen uptake data in the above-mentioned hospital passed the quality assurance protocol.
Conclusions: The quality assurance protocol and reference values of this study can be used for regular quality assurance of oxygen uptake measurement by cardiopulmonary exercise testing laboratories in Taiwan, as well as the ones from the Chinese. The protocol can be used as a quality assurance protocol in multi-center clinical trials in the future.

ABSTRACTS

Abstracts Presentation (Poster):

15.

Differences between Australia and Thailand Cardiac Rehabilitation Model of Care – A Review

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Objectives: The objectives of this review were to explore the differences between Australia and Thailand cardiac rehabilitation model of care with a specific focus on interventions that could be adapted to meet the cultural appropriateness of the Thai health system and to provide recommendations for improving cardiac rehabilitation programs in Thailand in the most effective manner for Thai socioeconomic status.
Methods: Review of trials reporting cardiac rehabilitation was an outcome measure. Electronic database (PUBMED) was searched from 1 January 1999 to 30 May 2011 in the English language. Inclusion criteria were: cardiac rehabilitation, cardiac rehabilitation model of care and cardiac rehabilitation guidelines in Thailand and Australia.
Result: There was limited evidence-based data about cardiac rehabilitation program efficacy, cost effectiveness and participation rates in Thailand. Most cardiac rehabilitation programs in Thailand were based on programs of low to moderate intensity exercise and group education, similar to Australia model which was found to be cost effective and safe from several studies. There were a limited number of health professionals in Thailand. Therefore it was important for staff to develop proper competencies to cover other team member roles if necessary to achieve multidisciplinary team approach. Difference from Australia model of care, self-management concepts and motivational interviewing have not been used generally in disease management in Thailand. Professional training should be developed and these concepts should be encouraged to use. There were separate exercise classes for specific groups in Australia while there was no such a class in Thailand model. Specific groups of patients should be prescribed separately in the cardiac rehabilitation session, such as heart failure and young patients. Community based cardiac rehabilitation program was rarely arranged in Thailand, while this program was widely used and shown effectiveness in Australia. Community based program should be implemented in Thailand to decrease barriers in Thai patients to participate in the program.
Conclusion: There were differences in the cardiac rehabilitation program between Australia and Thailand. This review provided recommendations for delivering cardiac rehabilitation program in the most effective and appropriate manner for Thailand's socioeconomic status, based on Australia cardiac rehabilitation model of care.

16.

Meta-analysis of Complication as a Risk Factor for Early Ambulation after Percutaneous Coronary Intervention

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Purpose: This study systematically examined previous studies on the effect of early ambulation on the vascular complications in subjects following percutaneous coronary intervention (PCI), and analyzed the effects of early ambulation on hemorrhage and hematoma formation at the puncture site.
Methods: Data were analyzed using the R (version 2.13.1) program. Publication bias was verified via regression analysis using the logarithm of the odds ratio (OR) and sample size, and a funnel plot using sample size. The risk ratio of the incidence of bleeding and hematoma formation at the puncture site relative to early ambulation was confirmed using ORs and the forest plot.
Results: The bed rest time had no significant effect on the risk ratio of hematoma formation [OR=0.89; 95% confidence interval (CI)=0.68-1.17] or the incidence of bleeding (OR=1.14; 95% CI=0.77-1.7) at the puncture site.
Conclusions: The findings of this study show that early ambulation following PCI had no effect on the incidence of hematoma formation and bleeding at the puncture site. However, differences in demographic factors should be considered carefully in order to avoid interpreting the results too broadly.

ABSTRACTS

Abstracts Presentation (Poster):

17.

Epidemiological Profile of Coronary Heart Disease in India

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Background: Coronary Heart Disease (CHD) is the leading cause of death in India and its contribution to mortality is rising. It's a narrowing of the small vessels that supply blood and oxygen to the heart. Study aim was to quantify the epidemiology of Coronary Heart Disease in India.
Methods: Epidemiological studies on Coronary Heart Disease had a significant impact on its research, care and prevention in the last decades. Southeast Asia region especially India has been considered to be the major risk of Coronary Heart Disease. Data were obtained through a compressive review using the MEDICINE and BIREME bibliographic database. In addition, conference reports and government publications were identified by government and nongovernment organization and other institutions.
Result: With 7.2 million deaths and 12.2% of total deaths, CHD is a worldwide disease. CHD is assuming serious dimension in India. It is expected to be the single most important cause of death in India by the year of 2015. In 2005 the prevalent rate of CHD in urban areas as 6.4% and 2.5% in rural areas. In urban areas the pooled estimate was 6.1% for males and 6.7% for females. In rural areas the estimate was 2.1% for males and 2.7% for females. With a total of 29.8 million affected (14.1 million in urban areas and 15.7 million in rural areas) according to the population-based cross-sectional surveys. In 1990, there were an estimated 1.17 million deaths from CHD in India, and now its double to 2.03 million by 2010. According to medical certification of cause of death data, 25.1% of total deaths in urban areas are attributable to disease of the circulatory system. Therefore, it was assumed that mortality rates due to CHD in rural areas are expected to be half of CHD specific mortality rates in urban areas.
Conclusions: Incidence of CHD is greater in urban areas than in rural areas reflecting the acquisition of several risk factors such as tobacco consumption, lack of physical activity, unhealthy diet and obesity. The vast majority of the populations in India are at risk of developing CHD because of higher than optimal levels of main risk factors.

18.

Result Assessment Ten Years Children with Dilate Cardiomyopathy in Heart Hospital of Shahiad Rajaee Tehran

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Background and Objectives: The most common disease associated with heart dysfunction is cardiomyopathy especially dilated type. Its prevalence is 36/5 in 10,000. This has a high mortality rate. Fifty percent of patients have a 5-year survival and 25% of them have 10 years. Hereditary factors, unknown and acquired are the causes of the disease. Therefore, this study was conduct for assessing of clinical symptom and laboratory indexes, prognosis, complications, treatment and mortality in patients with cardiomyopathy in 10 years.
Method: In this retrospective descriptive study, all patients discharged with final diagnosis of dilated cardiomyopathy who had referred to Rajai hospital during 10 years were studied.
Results: The fifty-four percent (54%) of patients were girls. Their mean age was 7.5 years. The most common ages who were referred was 3-4 years old. Average number of hospitalized was four times for each patient. Forty percent of patients were born in Tehran. The most common reason for referring (70%) was dyspnea. The most common clinical finding that reported was systolic murmur 3/6 in the left corner of Sternum (65%). The most common blood group of patients (52%) was B+. In a radiological findings (CXR), the most common symptom was big heart and the most important echocardiograph findings, was left ventricular dilatation (57%). The most important finding in the catheterization, was the reduced left ventricle contractility (EF=35%). The most common complication in patients was mitral valve regurgitation (24%) and left heart failure (22%). The embolism was reported as rare complication. In the relationship of prescribed medications and prognosis, digitalis compounds, Lasix and Aldacton were most prescribed medications that, two of whom died. For 19 patients, the three above drugs was administered with Hydralazyn that one of them had died. Course of the disease in this study showed that 42 patients (48%) were full recovery, 34 (38%) partial improvement and 8 patients were died. The average age of death, was 2.5 years. This study showed that the age of patients is higher, the mortality rate was reduced and heart failure is less. It is possible, blood group type of people, overcrowded environments and air Pollution influence on cardiomyopathy dilatation. Also, medicines prescribed can be effective in the prognosis of patients and their mortality rates. It is recommended that more studies be done about "the relationships of above variables with the prevalence or prognosis of dilated cardiomyopathy.

ABSTRACTS

Abstracts Presentation (Poster):

19.

Cardiac Manifestations of Classic Rheumatological Conditions: A Narrative Review

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Cardiovascular diseases are common in systemic rheumatologic diseases. They can be presented at the time of diagnosis or after diagnosis. The cardiac involvements can be the first presentation of rheumatologic conditions. It means that a patient with rheumatologic disease may go to a cardiologist when attacked by this disease for the first. These manifestations are very different and involve different structures of the heart, and they can cause mortality and morbidity of patients with rheumatologic diseases. Cardiac involvements in these patients vary from subclinical to severe manifestations. They may need aggressive immunosuppressive therapy. The diagnosis of these conditions is very important for choosing the best treatment. Premature atherosclerosis and ischemic heart disease are increased in rheumatoid arthritis and systemic lupus erythematosus, and may be a cause of mortality among them. The aggressive control of systemic inflammation in these diseases can reduce the risk of cardiovascular disease especially ischemic heart disease. Although aggressive treatment of primary rheumatologic diseases can decrease mortality rate and improve it, at this time, there are no specific guidelines and recommendations, to include aggressive control and prevention of traditional risk factors, for it.

20.

Comparison of Outcome Measures of 6 Versus 10 Exercise Sessions in Cardiac Rehabilitation

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Objectives: Cardiac Rehabilitation Program (CRP) is a multi-disciplinary program that has been shown to lower patients' risk of adverse cardiovascular events and mortality. It improves functional capacity, psychological well-being, quality of life and cardiac risk factors. We examined the differences in outcome measures between 6 and 10 exercise sessions within a 6 week period of CRP.
Methods: This is a retrospective study evaluating 254 patients with the diagnosis of coronary artery disease (CAD) who completed CRP (by choice of either 6 or 10 exercise sessions) at our institution from 2009-2011. They either received medical therapy or coronary revascularisation (percutaneous coronary intervention or coronary artery bypass graft) for the underlying CAD. Each exercise session consisted of 45 minutes of aerobic exercise and 10 minutes of resistance training (with 10 minutes each for warm up and cooling down). The aerobic training was initiated at 10% lower than the maximal heart rate achieved during the submaximal exercise bicycle test. The work rate was then gradually increased towards 80% of age predicted maximal heart rate.
Results: Seventy patients (28%) chose to undergo 6 sessions of CRP whereas the remaining 184 chose 10 sessions. The baseline demographics, risk factor profiles and mean ejection fraction were similar in both groups. For both groups, the majority of the patients were Chinese (77.2%) and there were male predominance (91.3%). For the overall study group, there were significant improvement in fat percentage (-1.3%; p=0.02) and exercise capacity (+17%; p<0.01) after cardiac rehabilitation. The exercise capacity was significantly higher in the 10 session group (13.6±18.8 watts vs 7.9±12.6 watts; p=0.02) when compared to the 6 session group.
Conclusion: Patient with CAD demonstrated significant improvements in fat percentage and exercise capacity after a short stint of CRP. The exercise capacity was significantly higher in the 10 exercise session group, thus confirming the dose-response beneficial impact of physical activity.

ABSTRACTS

Abstracts Presentation (Poster):

21.

Assessment of Periodontal Risk Factor for Atherosclerotic Cardiovascular Disease in Geriatric Patients

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Objectives: Numerous data have supported an association between periodontal disease (PD) and atherosclerotic cardiovascular disease (ACVD). Possible mechanisms proposed for this link include a host-parasite interaction resulting in chronic inflammation that is initiated by periodontal pathogens, such as *Porphyromonas gingivalis*. The purpose of this study was to assess periodontal risk factors implicated in ACVD in geriatric patients by characterizing periodontal pathogens.
Methods: Six periodontal pathogens present in saliva were quantified by using real time PCR in geriatric patient groups with PD (>60 years): mild (MCP), moderate (MoCP), and severe chronic periodontitis (SCP). The copy numbers of *P. gingivalis*, *Tannerella forsythia*, *Treponema denticola*, *Aggregatibacter actinomycetemcomitans*, *Fusobacterium nucleatum* and *Prevotella intermedia* were measured and compared among the groups.
Results: The results showed that bacterial copy numbers of tested periodontal pathogens increased as the severity of disease increases, except for *P. intermedia*. Significantly high numbers of *P. gingivalis*, *T. forsythia*, *T. denticola* and *F. nucleatum* were found in SCP than MCP. *P. gingivalis*, *T. denticola* and *F. nucleatum* showed significantly higher levels in MoCP, compared to MCP.
Conclusion: Collectively, results of this study suggest that the levels of *P. gingivalis*, *T. forsythia*, and *T. denticola* were increased as the severity of periodontal disease increases. It was found that *P. gingivalis*, a periodontal pathogen strongly implicated in ACVD may serve as a good indicator for assessing periodontal condition in geriatric patients. These results therefore suggest that in geriatric patients the level of *P. gingivalis* should be closely monitored, and this may lead to reducing potential risk factors for the development of ACVD. A regular periodontal checkup for geriatric patients with high risks of ACVD is strongly recommended.

22.

The Change of Smoking Behavior and Adherent to Preventive Guidelines after Heart Attack

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Background and Objectives: Risk factor modification is the key preventing subsequent cardiac events after heart attack. This study was designed to investigate the gap between preventive guidelines and clinical practice in smoking patients
Materials and Methods: The study was carried out in smokers who admitted with heart attack at 5 university hospitals in Korea. Total 275 patients who were on the regular follow up for more than one year after myocardial infarction (MI) were randomly selected and enrolled in this study. We investigated the change of smoking behavior and adherence rate to the ACC/AHA guidelines for the secondary prevention in patients with coronary artery disease, at the time of and 1 year after the event.
Results: The patients consisted of 267 males (97.1%) with a mean age of 57.0±11.2 years. The patients achieved target goals at one year were as follow; smoking cessation 51.3%, blood pressure 83.9%, HbA1C 32.7%, lipid 65.5%, body mass index 50.5%. Only 58.8% of the patients attempted to quit smoking and 45% of them started smoking again within 1 month after discharge. There was no previous smoking pattern (smoking onset age, amount and duration) associated with success or failure of quitting smoking. From the multivariate logistic analysis including smoking patterns and clinical characteristics, severity of coronary artery disease was the only independent predictor for smoking cessation (RR 1.230, p=0.022). On the other hand, continuous smoking was not the independent predictor of re-intervention or myocardial infarction at 1 year.
Conclusions: Only small percentage of MI patient adherent to guidelines for the secondary prevention. Furthermore, quite a few of smokers failed to quit smoking, therefore we need an effective patient education system to help them.

ABSTRACTS

Abstracts Presentation (Poster):

23.

The Benefits of Telephone Counselling on Smoking Cessation Intervention

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Objective: Smoking is one of the leading causes of death worldwide. According to the World Health Organization (WHO), six million people are killed by smoking including smokers, ex-smokers, and second-hand smokers. There is an alarming estimation that more than eight million annual deaths will be caused by smoking in year 2030. Also, the cardiovascular health risks of smoking on individuals' health are well documented. Due to the health hazards of smoking, telephone counselling is introduced as one of the smoking cessation interventions to encourage individuals to seek cessation services. The objective of the current study is to provide an overview of the benefits of telephone counselling on smoking cessation intervention.
Methods: A systematic literature review was conducted using Medline, PubMed, and Embase. With the use of keywords search, articles focused on the benefits of telephone counselling on smoking cessation were included. The results were analyzed and summarized.
Results: Telephone counselling was reported to be an effective and economical smoking cessation intervention. Many (60-80%) of the individuals who joined the telephone counselling services were able to follow up. There were about 30-55% individuals showed positive smoking cessation rate in six months post-program follow up when comparing to the control groups of about 2-12%. Telephone counselling provided a channel for the provision of and enhancing the effect of tailor-made printing materials when participants required for additional information during the counselling services. Telephone counselling could also strengthen the pharmacotherapy adherence among the participants who were reported to request for further pharmacotherapy intervention apart from receiving telephone counselling.
Conclusion: The benefits of telephone counselling on smoking cessation intervention are well supported. With the high mortality and health hazards of smoking, telephone counselling provides an effective means for encouraging smoking cessation.

24.

Evidence for Association of the Sleep Duration and Hypertension in the Young and Middle-aged Women but not Men and Old Women

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Objectives: Various studies have reported short sleep duration is associated with hypertension in western countries. Recent studies show that sleep deprivation may be associated with an increased risk of hypertension with possibly stronger effects among women than men. This study assesses age & sex-specific relationship between sleep duration and hypertension in Korean population.
Methods: We analyzed 7178 participants from age 19 to 99 years. The data were obtained from the Fourth Korea National Health and Nutrition Examination Survey conducted in 2008. Self-reported sleep duration was categorized into 5 groups. In this cross-sectional study, logistic regression was used to test the hypothesis that short sleep duration is associated with increased risk of hypertension.
Results: Sleep duration less than 6 hours was associated with increased risk for hypertension in the young and middle-aged women aged <65 years, (OR 1.89, 95% CI 1.23-2.91) after adjusting for multiple variables when 7 hours of sleep was used as a reference for sleep duration. There was no statistically significant correlation between sleep duration and hypertension in men & old-aged women aged <65 years.
Conclusion: In a Korean nationwide population-based sample, there is evidence for association of short sleep duration with an increased risk of hypertension, only among the young and middle-aged women aged <65 years.

ABSTRACTS

Abstracts Presentation (Poster):

25.

Association between Vitamin D Status and Chd Risk Assessed by Framingham Risk Score in Korean Population

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Objectives: Vitamin D has been suggested to be associated with coronary heart disease (CHD) risk. In this study, we evaluated the association between vitamin D status and CHD risk assessed by Framingham risk score (FRS) in Korean population.
Methods: Cross-sectional analysis of data from the Korean National Health and Nutrition Examination Survey V-1, 2010 was used to examine the association between serum 25-hydroxyvitamin D(25(OH)D) levels and the 10 year CHD risk assessed byFramingham Risk Score in a representative population-based sample of 8958 men and women aged 30 to 74 years.
Results: The prevalence of high risk group of CHD was 9.6% (SE 0.8) and 2.0% (SE 0.3), respectively.The prevalence of vitamin D deficiency (25(OH) D <20 ng/mL) was 58.3% of male and 74.0% of female subjects.The analysis has been stratified by sex due to CHD risk difference between males and females. Since Vitamin D deficiency had widespread distribution over all subjects, in this study, we classified vitamin D deficiency into 4 groups such as 25(OH)D <10ng/mL (group A), 10 ng/mL ≤25(OH)D <15ng/mL (group B), 15 ng/mL ≤25(OH)D < 20 ng/mL (group C) and normal group D. In case of men,the lowest category of 25(OH)D (<10 ng/mL) had an increased risk of CHD(OR=2.39 95% CI1.05-5.43), compared with the highest 25(OH)D category (≥20 ng/mL). However, in case of women, any significant association between 25(OH)D levels and CHD risk has not been observed in this study.
Conclusion: The present study suggests there is a significant association between vitamin D status and coronary heart disease risk in Korean male population.

26.

Estimation of Coronary Heart Disease Risk Factors in Diabetic and Non-Diabetic Patients in Qazvin City, Iran

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Background: Diabetes is a chronic disease. Patients with diabetes mellitus are high risk for coronary heart disease.
Materials and Methods: A cross-sectional study was designed. One hundrred diabetic patients were compared to 140 non-diabetics who were visited in metabolic diseases clinic at Qazvin, Iran in 2010. The study groups were interviewed through structured questionnaire containing clinical, anthropometric and laboratory questions. Data were gathered by trained nurses and analyzed statistically.
Results: Mean age of the patients was 46.25±1.54 VS 45.71±1.01 in case VS control groups. Overall, 42% of population was with diabetes mellitus and 58% were non-diabetic. There were significant differences between two subgroups in some variables include BMI, triglycerides, SBP, DBP, height, waist circumference/hip, hypertension, dyslipidemia and family history of diabetes (P<0.05). Some risk factors showed a significant difference between two groups too.
Conclusion: Results of present study are crucial for healthcare professionals and authorities. Lifestyle intervention programs should be focused on community education about reduction of CHD risk factors in diabetic patients. It is recommended that programs would be arranged with emphasis on primary and secondary prevention of blood glucose elevation and other risk factors for coronary heart disease in high risk individuals.

27.

Clinical Verification for Restenosis Despite Cardiac Rehabilitation after PCI

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Secondary prevention for myocardial infarction is one of the most important therapeutic target in ischemic heart disease (IHD). Cardiac rehabilitation is well recognized as one of the safe and effective therapy for secondary prevention of IHD. We present 4 patients (a 66-year-old female, a 58-year-old male, a 77-year-old male and a 59-year-old male) who were hospitalized with acute myocardial infarction (AMI). Urgent percutaneous coronary interventions (PCI) were performed. After PCI, they were enrolled to cardiac rehabilitation program with exercise training for 6 months. However, coronary angiographical examinations performed 6 months after urgent PCI revealed severe restenosis in their target lesion sites, we found no worsening in their exercise tolerance and no evidence of recurrence of cardiac ischemia or infarction. Cardiac rehabilitation with exercise training might be safe and effective to maintain their cardiac ischemic condition even in the cases with restenostic lesion after PCI.

ABSTRACTS

SYMPOSIUM

1.

Cardiac Rehabilitation is Yesterday's Service – Tomorrow's is Preventive Cardiology

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Cardiac rehabilitation has an honourable tradition of rehabilitating those who have suffered a myocardial infarction or following cardiac surgery. The evidence base for this service is strong with meta-analyses of randomised controlled trials reporting a reduction in total mortality and cardiovascular mortality, although no reduction in recurrent myocardial infarction or the need for revascularisation. In contrast a systematic review of secondary prevention programmes found a reduction in the risk of recurrent myocardial infarction and hospitalisations. However, this distinction between cardiac rehabilitation and secondary prevention is artificial as patients require a comprehensive programme which addresses lifestyle as a whole together with effective risk factor management and appropriate use of cardioprotective drug therapies. The European guidelines define priority patient groups as (1) patients with established atherosclerotic disease (coronary artery disease; cerebral arterial disease; peripheral arterial disease); (2) asymptomatic individuals who are at high risk of developing atherosclerotic disease because of (i) multiple risk factors resulting in a ten year risk of >5% for developing a fatal cardiovascular disease (CVD) event (ii) markedly raised levels of single risk factors including familial dyslipidaemia and severe hypertension (iii) diabetes mellitus; and (3) close relatives of patients with early onset atherosclerotic disease and asymptomatic individuals at particularly high risk. A modern preventive cardiology service should provide an integrated programme for secondary and primary prevention of CVD which addresses all these priority groups. The aim is to help patients with established atherosclerotic cardiovascular disease, and those asymptomatic individuals at high risk of developing cardiovascular disease, to reduce their overall risk of CVD, improve their quality of life and life expectancy. The goals of such a programme are to stop smoking, make healthy food choices and be physically active with a BMI goal of <25 Kg/m^2 and a normal waist circumference. The blood pressure goal is <140/90 mmHg. The lipid goal is a total cholesterol <3.0 mmol/l and LDL cholesterol <1.8 mmo/l for patients with established atherosclerotic disease, asymptomatic individuals with a very high CVD risk (fatal CVD >10% over 10 years) and for patients with diabetes with multiple risk factors or target organ damage. Beyond the use of drugs to lower blood pressure and lipids the appropriate use of other cardio-protective drug therapies is also recommended. The EUROACTION model of preventive cardiology set a new standard for preventive cardiology practice in hospital and primary care. MyAction is an evolution of EUROACTION for the National Health Service in England which integrates secondary and primary prevention in a community setting. This nurse-led, multidisciplinary, family centred, preventive cardiology programme is achieving healthier lifestyles for patients and families, together with improved risk factor control and a better quality of life.

2.

Cardiovascular Risk Factors in Hong Kong

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The Interheart Study showed clearly that nine major risk factors account for most of the myocardial infarctions worldwide, although in each country or region, the relative prevalence of these risk factors may be different. These nine risk factors are: abnonnal apolipoprotein B/apolipoprotein A-I (ApoB/ApoA-l) ratio, cigarette smoking, diabetes, hypertension, abdominal obesity, psychosocial stress, lack of exercise, unhealthy diet and no alcohol intake. It is worth noting that most of these are affected by lifestyle and genes have only a modest influence. In Hong Kong, smoking and alcohol drinking are not very prevalent. Therefore, the major opportunities for intervention are dyslipidaemia, diabetes, hypertension, abdominal obesity, exercise and diet. The Hong Kong Cardiovascular Risk Factor Prevalence Study (CRlSPS) cohort is a population-based prospective study that started in 1995-6, when 2895 subjects (1412 men and 1483 women), aged 25-74, were randomly recruited from the general population. Subjects were invited for follow-up in 2000-4 (CRlSPS2) and 2005-8 (CRlSPS3) to assess their cardiovascular risk factors, including diabetes, hypertension and dyslipidaemia. CRlSPS4 is now underway. In CRlSPS, we could trace how the aforementioned risk factors, namely, dyslipidaemia, diabetes, hypertension, abdominal obesity, exercise and diet, developed in the cohort. Lack of exercise and a diet with excessive calories and high glycaemic index lead to obesity, followed by dyslipidaemia and then diabetes and hypertension. In other words, the person develops the metabolic syndrome. CRlSPS3 has yielded a number of surprises. There was a striking increase in the prevalence of hypertension and the prevalence of abdominal obesity in this cohort, but the BMI has not increased, nor has the prevalence of diabetes. The increase in prevalence of hypertension might be explained by the increase in abdominal obesity. Our findings further confinn the importance of waist circumference in this population; calculating the BMI alone may give a false sense of security. The prevalence of hypertension in Hong Kong is now approaching the level in developed countries such as the United States. Clinical trials show that addressing obesity will reduce blood pressure and blood glucose. Current efforts are channelled towards the detection and treatment of cardiovascular risk factors in older adults. However, the rise in the prevalence of risk factors with age means that preventive measures, such as a healthy diet and regular physical activity, should start early in life.

ABSTRACTS

3.

Control of Risk Factors by Non-pharmacologic Interventions: Role of Life Style Changes in the Prevention of CVD

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A small percentage of the population spent the major part of the health-care budget to address diseases related with an unhealthy behavior and lifestyle. Those people are now sick due their way of life and not from diseases beyond their control, like genetics and environment. Many studies states that 80% of health-care budget by problems related with smoking, alcoholism, psychological stress, unhealthy food and physical inactivity leading the global pandemy of heart disease, diabetes, obesity and prostate/breast cancer, which are largely preventable and even reversible by changing diet and lifestyle. The majority of patients (PTS) with coronary artery disease (CAD), shows coronary arteries with major obstruction which leads to acute coronary syndromes, like myocardial infarction and sudden death. Procedures like PTCA and By-Pass Surgery, costs over 100 billion of dollars annually only in USA. In spite that, vein grafts, are generally blocked after few years and the PTCA, only in few months. Generally, doctors recommends to the PTS after those procedures to adopt an health lifestyle, to avoid new episodes or to slow the progress of the disease, like to stop smoking, eat well, moderate exercise and to coping with stress. Only 10% of them follow those recommendations. Many people tend to think of breakthroughs in medicine, as new drug or high-tech procedures in diagnosis and therapies, but often forgot that simple choices that we make in our lifestyles, can be as powerful as drugs and surgeries, an even better, at it was proved by Dean Ornish from the Preventive Medicine and Research Institute (PMRI). These choices are especially clear in Cardiology and large-scale studies have shown that lifestyle changes could prevent at least 90-95% of all heart diseases, which accounts for more premature deaths and costs worldwide. Recently, Dean Ornish and associates of the UCSF, published the first study, showing that lifestyle changes also may beneficially affect gene expression in only three months, turning on genes that prevent disease and turning off genes that promote heart disease and cancer. On the other hand, intensive lifestyle changes significantly increase telomerase and the telomere length, which are the ends of our chromosomes, that helping to control aging and the time of life.

4.

Lipid Treatment Update

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Statin therapy has become the mainstay of treatment for reduction of LDL cholesterol (LDL-C) to reduce cardiovascular risk and more intensive statin therapy provides additional risk reduction. Mono-therapy with statins may be insufficient in subjects with very high baseline LDL-C and some patients are intolerant of statin treatment or may have adverse drug interactions and more intensive statin treatment is associated with a small increase in the risk of developing diabetes. Combining statins with ezetimibe may result in more effective reduction of LDL-C but whether this combination results in improved outcomes compared to more intensive statin therapy remains to be proven. New forms of therapy to reduce LDL-C with monoclonal antibodies to PCSK9 or antisense oligonucleotides to Apo B-100 are currently under development and can result in more effective reduction of LDL-C. For patients with combined dyslipidaemia with elevation of triglycerides and lower levels of HDL cholesterol there are the options of adding niacin or fibrates. Beneficial effects have been seen in some outcomes with these treatments and ongoing studies may help to define the role of niacin in some patient groups. Some of these questions will be answered by the ongoing studies but optimization of lipid-modifying treatment for individual patients is likely to remain an uncertainty for many years to come. Statin therapy is likely to remain the cornerstone of treatment, but combinations with other drugs will become more popular.

ABSTRACTS

5.

Cardiac Rehabilitation Program for Patients after Coronary Artery Bypass Grafting Surgery

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Coronary artery bypass grafting surgery (CABG) and percutaneous coronary intervention (PCI) are the most common methods of revascularization for symptomatic coronary artery disease (CAD). These two interventions can reduce ischemic symptoms such as angina or dyspnea, thus improving the ability to undertake physical training. In general, CABG remains the method of choice in patients with left main disease, multivessel disease, especially in diabetic patients, or patients with left ventricular dysfunction, in the event of failure of PCI, and in-stent restenosis. Although the procedure risk is higher for patients receiving CABG, the extent of revascularization is more complete, and hence the potential of training is higher than patients with PCI. Short-term exercise training for patients with CABG showed benefits to cardiorespiratory function, muscular strength, metabolic profile, cardiac function, ventilatory threshold, hemodynamic function and quality of life. Additionally, exercise training may improve graft patency, reduce cardiac events and readmission rate. Thus, CR exercise training is an important intervention and should be recommended to most of the patients after CABG. Phase I cardiac rehabilitation (CR) delivers rehabilitative services to hospitalized CABG patients following CABG. Phase I CR can decrease the deleterious physiologic and psychological effects of bed rest, enable patients to safely return to activities of daily living within limits, and facilitate patient entry into an outpatient phase II CR program. The exercise training of phase II CR improves exercise capacity, without significant complications or other adverse effects. For patients with CABG, previous studies reported 10.5%-48.2% increase of peak oxygen uptake in outpatient CR, and the increase of absolute value was 1.9-6.6 mL/kg/min, depended on different exercise protocol and the initial level of fitness. Tai Chi Chuan (TCC) is a popular Chinese conditioning exercise. The exercise intensity of TCC was low to moderate, depends on its training style, posture and duration. We have applied a 12-month TCC program to patients with CABG as a phase III cardiac rehabilitation program. After training, the TCC group showed an increase of 10.3% in peak oxygen uptake and 11.9% in peak work rate. Therefore, TCC may be prescribed as an alternative exercise program for selected patients with CABG.

6.

Remote Medicine in Home Cardiac Rehabilitation by ICT

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Cardiac rehabilitation basically consists of behavior medicine and based on modification of life style such as exercise, food and smoking cessation. There are some problems to achieve behavior medicine, since recording of the patient's physical/vital data in daily life is not easy for long period and simultaneously subsequent feed-back of those data are also more difficult. However, ITC (Information Technology Communication) will make some solutions of these problems. We developed ICT home monitoring system, which obtain home vital data such as blood pressure, steps of walk and body weight automatically through wireless gateway system and feed back some messages to patients by e-mail for keeping of patient's positive daily activity. Our study in metabolic syndrome subjects showed that the ICT home monitoring group (body weight, steps, blood pressure) showed more reduction of body weight compared with the subjects without home monitoring. And the subjects with feed-back message showed highest reduction of body weight. The subjects with myocardial infarction also showed good control of body weight and blood pressure when followed by ICT home monitoring system. These data showed ICT home monitoring and feed-back would quite cost-benefit and effective system of cardiovascular disease management. Now we are using real time ECG monitoring system through just simple LAN and smart phone. These ECG data will be more convenient and useful for not only emergency situation but also daily cardiac monitoring. We will show the latest system for these cardiac monitoring systems.

ABSTRACTS

7.

The Safety of Exercise in Patients with Known Heart Disease

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Cardiac rehabilitation has been proven to be safe and beneficial to patients who have underlying cardiovascular abnormalities. However, many such patients may also be interested in participating in vigorous activities such as competitive sports or marathons which would occur in an unsupervised environment. Guidelines on whether such persons should consider doing these activities remains nebulous at times. Many factors need to be considered when making an assessment of safety. Persons who can be classified as having underlying heart disease encompass a wide spectrum of risk. On one hand we have persons who are asymptomaptic but have been found to have sub-clinical atherosclerosis. They are generally at lower risk to those with known coronary ischemia or critical valve abnormalities that have not been reversed by medications or surgery. Another consideration beside the person's underlying cardiac abnormality is the type of exercise for which he/she plans to undertake. Exercise can generally be divided into dynamic (isotonic) or static (isometric) although most exercise or sports encompasses both components to varying degrees. The duration, intensity of exercise and the environment in which it is conducted must also be factored in. Generally, stress testing remains the main modality for assessment. During stress testing, attention is paid to the presence of ischemia, the effort tolerance of the person, the presence or absence of significant arrhythmia and the blood pressure and heart rate response. However, stress testing often cannot replicate the true stress that a person undergoes during competitive or endurance sports. In conclusion, there are fundamental variables that should be considered when deciding if patients are suitable to safety undertake strenuous activities. The final decision should however be a choice made by patients themselves after careful discussion with their physicians.

8.

Cardiac Rehabilitation Issues: Return to Work

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One of the main ultimate goals of a cardiac rehabilitation is to support the patients in resuming to their normal life, and one important issue among normal life is return to work. Patients with heart disease should be able to return to their work safely after cardiac events. Is has been stated that patient after acute myocardial infarction without any complication should safely return to their previous works: light job after 2 weeks and 6 weeks for strenuous job. In Europe and the United States, there were 60% and 93% respectively for returning to work. Our data revealed that only 40 percent of patient, who aged at or less than 60 years old, and needed to return to work, was able to return to their work. The determinants of return to work are severity and prognostic of heart disease, the residual loss of function after heart disease. For individual consideration of return to work are incidence of heart at work, psychological factors, age, type of job, and attitude of involved personnel. Patients with heart disease who attend cardiac rehabilitation program comprised of physical training, psychological support and vocational counseling, demonstrated the higher rate of returning to work. The review by Shepherd indicates that cardiac rehabilitation improves the quality of life for coronary heart disease patients and that quality of life improvements have a bi-directional relationship with increased physical activity and vocational status. Return to drive as a job is differently and there is no definite protocol for this issue. Exercise and functional testing will have an important role in this situation. Three cases of patient will be discussed: patient with unstable angina, patient with heart failure and patient with implanted device.

9.

Tobacco Policies and Prevention of CVD in Asia

JL MACKAY,[1] A GRAINGER-GASSER,[2] M NAKAMURA,[3] R GREENLAND,[4] T DUNCAN[5]
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In nations in which the tobacco epidemic has declined, in nearly all cases it was physicians who led the way by changing their behaviour from being one of the groups with the highest smoking prevalence to being one of, if not the, lowest. Therefore, in any nation where the tobacco epidemic is still large, focusing on reducing smoking among physicians and involving them in tobacco control activities may be the most important action a national tobacco control movement can take. Cardiologists have a critical role in the tobacco epidemic. They have close contact with patients, are on the front line of health care, are well respected and a trusted source of healthcare advice, and should act as role models and exemplars for healthy behaviour. To reduce cardiovascular disease (CVD) in Asia, CVD health professionals will need to support on-going tobacco control measures at the population level more strongly, especially the World Health Organization Framework Convention on Tobacco Control (WHO FCTC), and particularly to advise non-smokers to avoid second-hand smoke, and support smokers (and other tobacco users) to quit. The traditional medical model will never be able to reduce tobacco use, and a new paradigm is needed to combat the epidemics of the 21st century. Proven, effective strategies to reduce the tobacco epidemic are already known, and it only requires political will, with the support of health professionals, to implement these.

ABSTRACTS

10.

The Utilisation of Cardiovascular Imaging for Detection of Early Atherosclerosis

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Current guidelines for primary prevention recommend initial assessment and risk stratification based on traditional risk factors (e.g. the Framingham Risk Score [FRS] in the United States and the Systemic Coronary Risk Evaluation in Europe), followed by goal-directed therapy as necessary to modify those risk factors. However, these traditional prevention strategies can be inadequate, as cardiovascular events do occur in patients without known risk or in low and intermediate risk groups in whom an aggressive treatment strategy would not be indicated. Thus, earlier detection of anatomically or metabolically significant, but "subclinical" or "preclinical" atherosclerosis may allow for more timely intervention that in turn may prevent progression to symptomatic illness, vulnerable plaque formation or sudden death. In this presentation, we will explore the current and potential clinical roles of different imaging tools including Ultrasound, Computer Tomography, and Magnetic Resonance Imaging on the detection of early atherosclerosis.

11.

How to Improve the Drug Compliance of Hypertensive Patients

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Hypertension has become a major health burden worldwide in past decades. Suboptimal blood pressure control in hypertensive patients can result in detrimental clinical consequences such as myocardial infarction, renal dysfunction and cerebrovascular accident. Studies have shown that poor drug compliance is one of the key reasons for suboptimal blood pressure control. Hence, improvement in drug compliance can certainly improves blood pressure control. According to several large-scaled clinical trials, because of social inconvenience, patients who require multiple anti-hypertensive drugs have worse drug compliance than those who require single drug therapy only. For the similar reason, complex therapy regimes (3-4 times per day) can also result in poor drug compliance as patients tend to forget their mid day doses. In order to overcome these obstacles, single pill combination (SPC) is a good option to improve patients' drug compliance. SPC is generally well-accepted by hypertensive patients as it can cut down their daily tablet number by 3-4 pills. Moreover, most of the SPC preparations in the market are in once-daily basis. This certainly simplifies the therapy regime and provides patients with a great deal of convenience. Last but not least, calcium channel blocker (CCB) induced pedal edema, though harmless, can be very disturbing to hypertensive patients. This side effect can be alleviated by an additional angiotensin-converting enzyme inhibitor (ACEI) or angiotensin II receptor blocker (ARB). By using a SPC of both CCB and ARB, incidence of pedal edema is significantly reduced when compared to CCB single therapy.

In 2009, European Society of Hypertension guideline has stated "When possible, use of fixed dose (or single pill) combinations should be preferred because simplification of treatment carries advantages for compliance of treatment."

12.

Prevention of Hypoglycemia – The Evidence of Incretin-based Therapy

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Despite having numerous new hypoglycemic agents, the principle of managing diabetes mellitus (DM) relies on old wisdom – Individualization. The new ADA-EASD position statement points out clearly that avoidance of hypoglycemia is of prime importance, particularly for those patients who have significant cardiovascular diseases. Studies show that hypoglycemia increases the risk of arrhythmias and precipitates heart attack. Incretins play an important role in glucose metabolism. Both glucagon-like peptide-1 (GLP-1) analogues and dipeptidyl peptidase-4 (DPP-4) inhibitors are effective on blood glucose control in patients with type-2 DM. More importantly, this class of drugs has less hypoglycemia when comparing to sulphonylureas, so that they may be better choice for those susceptible patients both as monotherapy and combination with others like metformin or insulin.

13.

HDL-cholesterol – Risk Factor or Risk Target?

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The Joint European Societies Guidelines on CVD prevention updated in 2012 continue to advocate total vascular risk assessment and management. The European risk estimation model called SCORE (Systematic Coronary Risk Estimation), based on European populations, is available for high and low risk countries, and country specific versions are also available. The risk threshold for more intensive lifestyle intervention and, where appropriate, the use of drug therapies is now defined as ≥5% fatal CVD risk over 10 years. The inclusion of HDL-cholesterol as a risk factor in SCORE is highlighted in the most recent version of the prevention guidelines as making an independent contribution to CVD risk prediction. In addition to calculating the total SCORE, including HDL-cholesterol, for an individual the physician has to also take into account other risk factors such as diet, a sedentary lifestyle, central obesity and evidence of dysglycaemia – impaired fasting glycaemia or impaired glucose tolerance. All of these factors further increase the total CVD risk. An electronic version of SCORE called HEARTSCORE (www.escardio.org/heartscore) is available on the European Society of Cardiology website and can be downloaded free of charge. Although there is compelling evidence from randomised controlled trials that reducing LDL-cholesterol will reduce total and cardiovascular mortality as well as cardiovascular morbidity there is little evidence that modifying HDL-cholesterol will improve outcomes in high risk patient populations. So HDL-cholesterol is an important risk marker but not, at the present time, a therapeutic target for clinical practice.

ABSTRACTS

PUBLIC CONFERENCE

1.

How to Choose Functional Foods to Enhance Heart Health

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Heart disease is the second leading cause of death in Hong Kong. Causes of heart diseases can be due to poor lifestyle habits such as unhealthy eating (i.e. high fat, sugar and salt), lack of exercise, smoking, excessive alcohol consumption and stress. Health professionals including doctors and dietitians/ nutritionists have been trying to deliver messages to encourage the public to eat a low fat (especially saturated and trans fat), low sugar and salt, and high fiber diet to lower the risk of heart diseases. But in recently decades, scientists have also found some "functional foods" that works beyond basic nutrition. "Functional Foods" is defined as foods and food components that provide a health benefit beyond basic nutrition. Functional foods may include conventional foods, fortified, enriched, enhanced foods and also dietary supplements. Functional foods provide essential nutrients beyond quantities necessary for normal maintenance, growth, and development. It can also provide other biologically active components that impart health benefits or desirable physiological effects. Functional foods for heart health have been studied extensively in the past years. Examples include oatmeal, soy, tomatoes, nuts and seeds, fish, flaxseed, tea, red wine, color fruits and vegetables and more. In this seminar, the scientific evidence based health benefits and the practical use of these functional foods will be revealed.

2.

Exercise Workshop

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Regular exercise program, especially cardiovascular exercise, has many benefits for heart attack victim or sedentary person. It strengthens our heart and cardiovascular system, lower blood pressure, reduces low-density lipoproteins/triglyceride and increase high-density lipoproteins. Exercise can be divided into three types: stretching, cardiovascular aerobic, muscle strengthening exercises. Cardiovascular exercise is a steady rhythmical physical activity using large muscle groups with low impact. Aerobic exercise includes brisk walking, jogging, bicycling and aerobic dance etc... In order to achieve maximum benefits, people should gradually work up to an aerobic session of at least 20 to 30 minutes, at least three to four times a week. Strengthening exercise is repeated muscle contractions by using dumbbell, sandbag or theraband. It improves muscle strength, help tone muscles and increase metabolism. In this exercise workshop, ways to start up an exercise regimen, obtain target heart rate, self-monitoring techniques and exercise precautions would be introduced. Moreover, some community resources are available to reinforce active lifestyle, risk factor modification, regular exercise habit and to increase patient self esteem and confidence.

Tobacco Policies and Prevention of Cardiovascular Disease in Asia

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MACKAY ET AL.: ***Tobacco Policies and Prevention of Cardiovascular Disease in Asia*****.** In nations in which the tobacco epidemic has declined, in nearly all cases it was physicians who led the way by changing their behaviour from being one of the groups with the highest smoking prevalence to being one of, if not the, lowest. Therefore, in any nation where the tobacco epidemic is still large, focusing on reducing smoking among physicians and involving them in tobacco control activities may be the most important action a national tobacco control movement can take. Cardiologists have a critical role in the tobacco epidemic. They have close contact with patients, are on the front line of health care, are well respected and a trusted source of healthcare advice, and should act as role models and exemplars for healthy behaviour. To reduce cardiovascular disease (CVD) in Asia, CVD health professionals will need to support on-going tobacco control measures at the population level more strongly, especially the World Health Organization Framework Convention on Tobacco Control (WHO FCTC), and particularly to advise non-smokers to avoid second-hand smoke, and support smokers (and other tobacco users) to quit. The traditional medical model will never be able to reduce tobacco use, and a new paradigm is needed to combat the epidemics of the 21st century. Proven, effective strategies to reduce the tobacco epidemic are already known, and it only requires political will, with the support of health professionals, to implement these. *(J HK Coll Cardiol 2012;20(Suppl 2):B36-B46)*

Health professional, smoking, tobacco, tobacco control

摘要

在那些煙草流行已經減退的國家，幾乎都是醫生帶頭通過改變人們的習性，從而使他們從高吸煙人群轉變爲低吸煙人群。因此，在任何煙草仍盛行的國家，致力於減少醫生中的煙民並讓他們參與煙草控制活動可能是國家煙草控制運動可以採取的最重要的措施。心臟病專家在控制煙草流行中有至關重要的作用。他們站在醫療保健的最前線，與患者有密切聯繫，備受尊敬和信賴，並應當成爲健康行爲的榜樣和典範。爲了減少亞洲心血管疾病（CVD），CVD衛生專業人士將需要更加強烈支援正在進行的煙草控制措施，特別是世界健康組織煙草控制框架公約（WHO FCTC），尤其要建議非吸煙者防止二手煙，同時幫助吸煙者（和其他煙草使用者）戒煙。傳統的醫學模式無法減少煙草使用者，我們需要一種新的模式來應對21世紀的煙草流行。實踐證明，減少煙草流行的有效的戰略已衆所周知，我們僅僅需要政治意願和健康專業人士的支援來將其付諸實施。

關鍵詞：衛生專業人士，吸煙，煙草，煙草控制

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The Cardiovascular Disease Epidemic

According to World Health Organization (WHO), an estimated 17.3 million people died from cardiovascular diseases (CVDs) in 2008. Over 80% of CVD deaths take place in low- and middle-income (LMIC) countries. The epidemic is expanding: by 2030, almost 23.6 million people will die from CVDs.[1]

CVD is increasing throughout Asia, resulting in serious health and economic consequences. South Asians may be more susceptible to CVD.[2] The major risk factors for CVD in Asia are essentially the same as in western countries-tobacco, diabetes mellitus, hypertension and cholesterol.[3] Treatment of CVD is neither available nor affordable to many in the region, ***thus the emphasis must be on prevention***.

The Tobacco Epidemic

The WHO Global Atlas on Cardiovascular Disease Prevention and Control entitles the chapter on tobacco: 'The totally avoidable risk factor of CVDs.'[4] Tobacco use is a leading preventable cause of CVD, causing an estimated 10% of CVD.[5] Reduced CVD risk is one of the most immediate and tangible gains from reducing tobacco use. The risk of vascular disease falls to that of a never-smoker inside 5 years of quitting compared to 30 for lung cancer and 20 for respiratory disease.[6]

There are currently about one billion smokers in the world.[4] The tobacco epidemic has persisted in spite of centuries of knowledge and decades of action, progress in policy development and public awareness, multiple World Health Assembly resolutions, 15 World Conferences since 1967, many regional, national and sub-national meetings, regional action plans, the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) which came into effect in 2005,[7] and the 2011 United Nations (UN) High Level Meeting Summit on NCDs.[8]

The health effects of tobacco use and exposure to second-hand smoke are well established, and new evidence continues to emerge on the mechanism and extent of the CVD harm.[9] There is no safe use of tobacco, whether smoked, chewed, sniffed or dissolved.[10] Nearly six million people die from tobacco use and exposure to second hand smoke each year, accounting for 6% of all female and 12% of all male deaths in the world. By 2030, tobacco-related deaths are projected to increase to more than 8 million deaths every year.[4] Thus, the tobacco epidemic is expanding, and is likely to do so for several decades to come. Even if prevalence rates are reduced, any benefits will be offset by the increased numbers of smokers, due to population expansion in the LMIC.

Most of Asia's smokers are men (Illustrations 1 & 2).[11]

Health professional students and health professionals still use tobacco at an unacceptable rate[12,13] (Illustration 3). In China, the smoking prevalence among male physicians is 32%,[14] and 13% among male medical students.[15] The prevalence rate among male nurses is even higher, at 52.2%[16] compared with 18.7% among rural male Japanese nurses (and 10.8% among female nurses).[17]

A Call to Action for Health Professionals

Cardiologists have a critical role in the tobacco epidemic.[18,19] They:

- Have close contact with patients
- Are on the front line of health care
- Are well respected and a trusted source of healthcare advice
- Are role models and exemplars for healthy behaviour

Code of practice: In 2004, WHO produced a code of practice on tobacco control for health professional organizations, which has now been endorsed by major international health organizations,[20] including World Heart Federation[21] and the Initiative for Cardiovascular Health Research in Developing Countries[22] (Table 1).

Advocacy: Historically, the medical profession has played a key advocacy role. One example of successful advocacy was the UK Royal College of Physicians publication '*Smoking and Health'* in 1962. It was a seminal piece of work by the medical profession

Illustration 1. *Prevalence of male cigarette smoking by country, 2010 or later.*[11]

Illustration 2. *Prevalence of female cigarette smoking by country, 2010 or later.*[11]

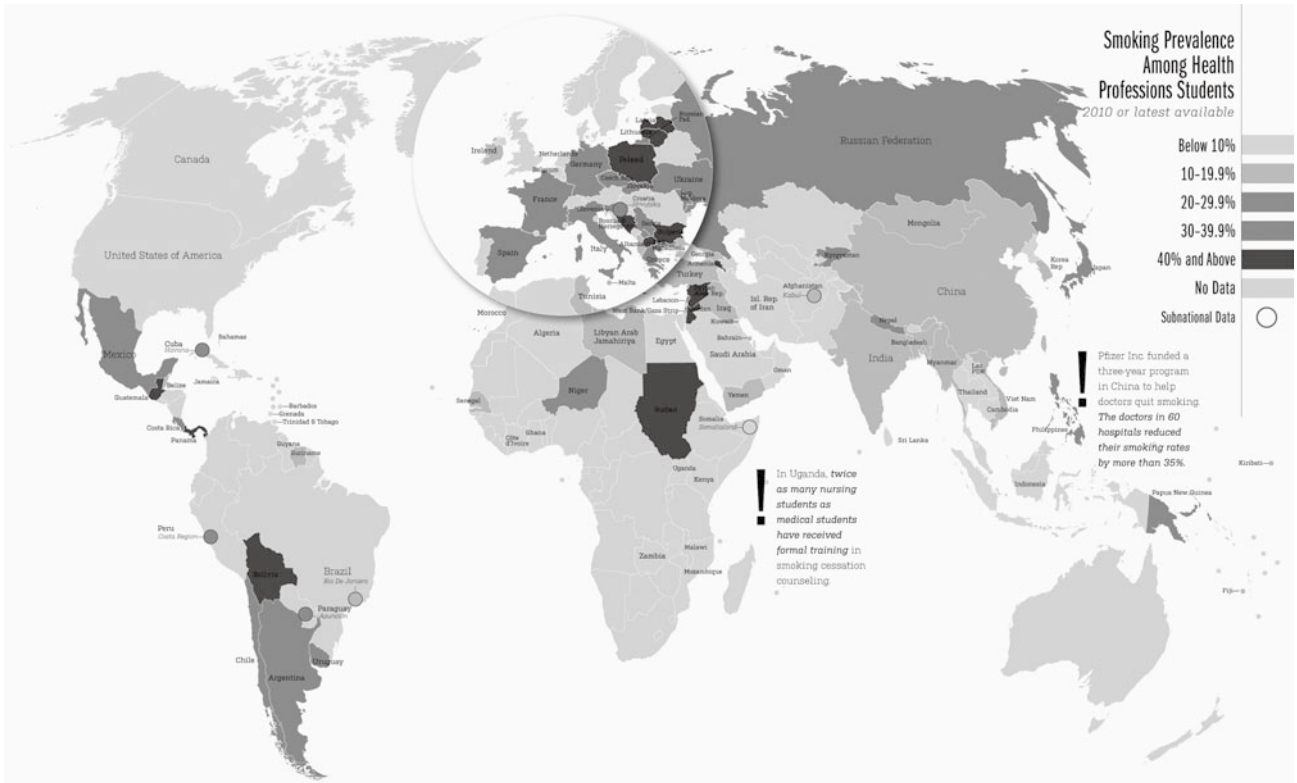

Illustration 3. *Smoking prevalence among health professions students.*[11]

Table 1. WHO Code of practice on tobacco control for health professional organizations

Preamble: In order to contribute actively to the reduction of tobacco consumption and include tobacco control in the public health agenda at national, regional and global levels, it is hereby agreed that health professional organizations will:

1. Encourage and support their members to be role models by not using tobacco and by promoting a tobacco-free culture.
2. Assess and address the tobacco consumption patterns and tobacco-control attitudes of their members through surveys and introduction of appropriate policies.
3. Make their own organizations' premises and events tobacco-free and encourage their members to do the same.
4. Include tobacco control in the agenda of all relevant health-related congresses and conferences.
5. Advise their members to routinely ask patients and clients about tobacco consumption and exposure to tobacco smoke – using existing evidence-based approaches and best practices--, give advice on how to quit smoking and ensure appropriate follow-up of their cessation goals.
6. Influence health institutions and educational centres to include tobacco control in their health professionals' curricula, through continued education and other training programmes (see Illustration 4).
7. Actively participate in World No Tobacco Day every 31 May.
8. Refrain from accepting any kind of tobacco industry support – financial or otherwise --, and from investing in the tobacco industry, and encourage their members to do the same.
9. Ensure that their organization has a stated policy on any commercial or other kind of relationship with partners who interact or with interests in the tobacco industry through a declaration of interest.
10. Prohibit the sale or promotion of tobacco products on their premises, and encourage their members to do the same.
11. Actively support governments in the process leading to the signature, ratification and implementation of the WHO Framework Convention on Tobacco Control.
12. Dedicate financial and/or other resources to tobacco control – including dedicating resources to the implementation of this code of practice.
13. Participate in the tobacco-control activities of health professional networks.
14. Support campaigns for tobacco-free public places.

in changing Government policy. Some cardiologists in Asia have been outstanding in taking a leadership role on tobacco control. Other examples are the role of the medical profession in supporting the WHO FCTC, and the championing of plain packaging by heart organizations in Australia.[23] The rationale for cardiologists' involvement can be summarised:[24]

- Adult smokers have approximately twice the risk of a cardiovascular event over 5 to 10 years compared with non-smokers
- Prospective cohort studies show the beneficial effect of smoking cessation on coronary heart disease mortality,[25] the benefits being greater than any other single intervention.
- The excess risk of heart disease is reduced by half after one year's abstinence and is reduced to the level of a never smoker within 5 years
- In those with existing heart disease, cessation reduces the risk of recurrent infarction or mortality by half
- Brief advice to quit is one of the most important interventions health professionals can deliver and roughly doubles the chances of long term quitting.[26]

Cessation. As an example, the Government of New Zealand has recently introduced a goal to ensure 90% of eligible adults are assessed and appropriately managed for cardiovascular risk. All patients should be asked if they smoke and, if the answer is yes, to be offered brief advice and referral to quitting services. The Heart Foundation is active in training health professionals to undertake smoking cessation as part of their everyday work.

Yet, in much of the world, health professionals receive no formal training in cessation (see Illustration 4).

Non-smokers

Given the high male smoking rates in Asia, female non-smokers require special mention. Getting a woman's husband to stop smoking and her workplace to go smoke-free is nearly as important for her health as reducing her salt and giving her BP medication.[27]

CVD Organizations

There are several global, regional and national CVD foundations, such as the World Heart Federation (WHF),[28] Asian Pacific Cardiology Society (APCS)[29] and the Asia-Pacific Heart Network (APHN).[30] World Stroke Organization (WSO),[31] and Asia Pacific Stroke Organization (APSO).[32] Historically, these organizations have focussed more on hypertension, cholesterol, and intervention and treatment, rather than on tobacco. Tobacco has rarely been a Keynote or Plenary topic at

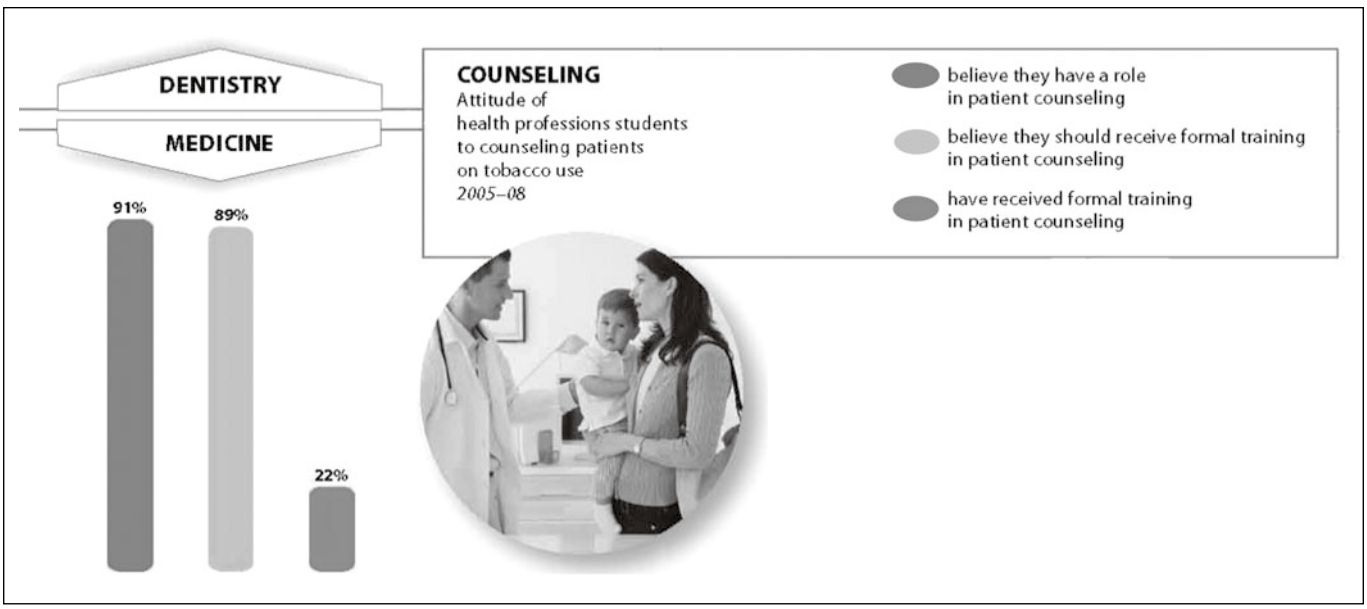

Illustration 4. *The lack of formal training in patient counselling*[13]

CVD conferences, and few cardiologists attend the triennial World Conferences on Tobacco or Health. This is now changing, with tobacco sessions at CVD meetings, albeit usually less well attended than those revealing the latest in intervention gadgetry.

"Advancing a tobacco free world" is a pillar of World Heart Federation (WHF) 2010-2015 strategy. In 2010 the WHF launched an initiative to engage cardiologists in tobacco cessation and control at its World Congress of Cardiology (WCC) in Beijing and created a film and pamphlet on CVD and secondhand smoke to disseminate findings from the IOM report. In 2011-2012 WHF developed the initiative further through the project *Engaging Cardiologists in Tobacco Control*. This involved:

- Co-publishing the report *Cardiovascular Harms of Tobacco Use and Exposure to Secondhand Smoke: Global Gaps in Awareness and Implications for Action.*[33]
- Mapping cardiologists and member organizations engaged in tobacco control around the world.
- Organizing a regional workshop at the World Conference on Tobacco or Health, in 2012 in Singapore with APHN and Global Smokefree Partnership (GSP) for APHN/WHF member organizations.
- Organizing a workshop at the WCC 2012 in Dubai for cardiologists and member organizations from around the world, particularly from the Middle East.
- Publishing an issue focused on tobacco control in *Global Heart*, the WHF journal.

Through these activities, the WHF has developed a network of cardiologists/heart health organizations from around the world who are engaged in tobacco cessation and control. It has also identified barriers and opportunities for increasing cardiologists' engagement in tobacco cessation and control. As an outcome to its activities, Asia-Pacific Heart Network developed a regional strategy for mobilizing its member organizations to take action in tobacco control (The APHN's 'Heart Charter' – modelled on the European Heart Health Charter), and the Asian Pacific Society of Cardiology (APSC) has endorsed the strategy. Subsequently, the Philippines Heart Association and Chinese Cardiology have held meetings on tobacco and heart health and the APHN plans to have a member meeting on tobacco at the 2013 APSC conference.

The APHN has stated: "The Regional Plan sets out the need for all Asia-Pacific nations to have medical societies, associations and heart foundations talking leadership and responsibility to support our over-arching goal of reduction of tobacco use for more effective prevention of CVD. It is clearly professionally inappropriate to continue to build clinical services for disease management without balancing this with enhanced preventive measures to stem the tide of CVD in the region."

Individual country heart foundations have taken strong action, for example: Bangladesh Heart Foundation leads a national coalition that aims to engage physicians in tobacco control. The Indonesian Heart Foundation hosts a national coalition that has supported advertising bans and smoke-free policy.

FCTC

The WHO FCTC, which came into effect in 2005, has now been adopted by 176 parties,[34] covering 87.4% of world population. It represents a paradigm shift in developing a regulatory strategy to improve health,[35] one that might in future be considered for other CVD risk factors. The Western Pacific Region is still the only WHO region in which every single country has ratified the Convention (see Table 2), but Indonesia in the South East Asia region has yet to become a signatory or to ratify.

MPOWER

In 2008, recognising the need to advance cost effective measures and to help countries fulfil some of their WHO FCTC obligations, WHO introduced in 2008 the 'MPOWER' package of six evidence-based tobacco control demand reduction measures, offering a useful framework for action (Table 3). Under the MPOWER

structure WHO publishes biannual series of Reports on the Global Tobacco Epidemic, which provide an unprecedented level of detail and roadmaps for effective solutions.[36]

Role of Government

There is robust evidence that tobacco control is cost-effective compared with other health interventions.[35] "Best buy" proven, effective interventions include tobacco tax increases, restrictions on smoking in public places and workplaces, comprehensive bans on all promotion, and timely dissemination of information about the health risks of smoking.[35] It only requires political will to implement these, and here the influence of the CVD professional is key.

At national level, there are some measures that only governments can mandate, such as smoke-free areas, health warnings and bans on all promotion, remove business operating licences for non-compliance of smoke-free legislation or of bans on sales to youth, implement taxation policy, and ratify UN treaties, such as the WHO-FCTC. This works best when supported by civil society. ***This also means political lobbying must be high on the agenda of anyone hoping to influence public health policy and reduce CVD.***

Article 5.3 of the FCTC warns against tobacco industry interference with government public health policies, which applies to all sectors of government. The

Table 2. Main provision of FCTC[11]

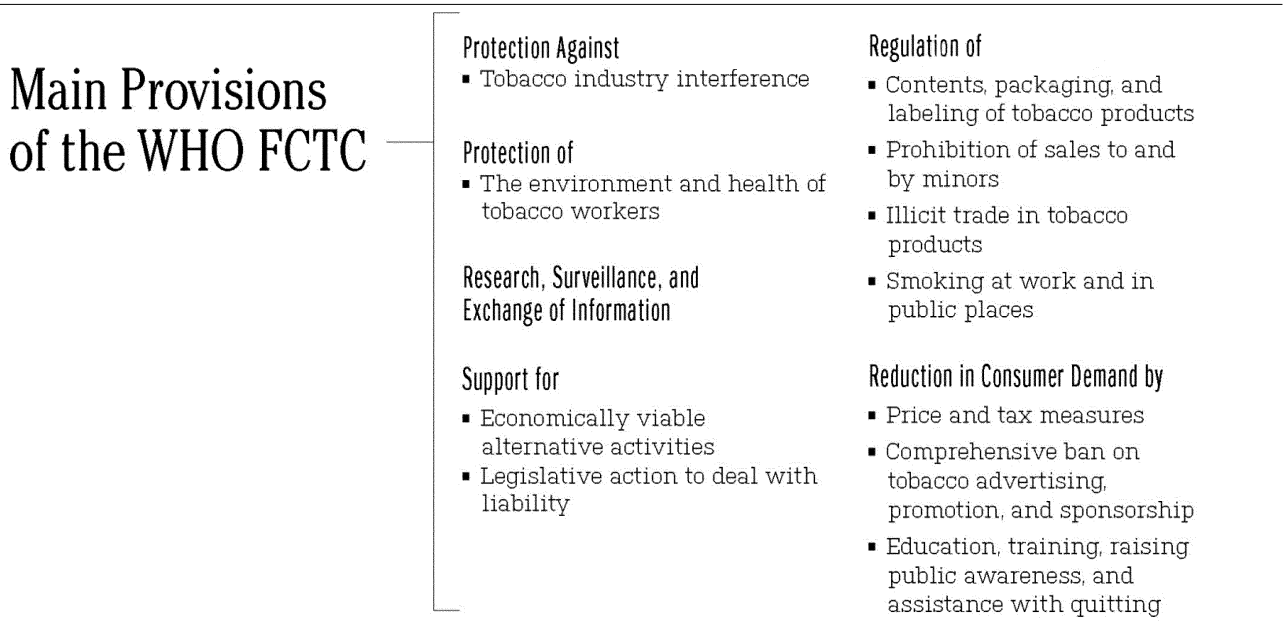

Table 3. MPOWER[37]

	WHO MPOWER	WHO FCTC Article
M	Monitor tobacco use and prevention policies	20,21
P	Protect people from tobacco smoke	8
O	Offer help to quit tobacco use	14
W	Warn about the dangers of tobacco	11,12
E	Enforce bans on tobacco advertising, promotion and sponsorship	13
R	Raise taxes on tobacco	6

accompanying Guidelines state: Parties should not allow any official or employee of government or of any semi/quasi-governmental body to accept payments, gifts or services, monetary or in-kind, from the tobacco industry.[38] Dr Margaret Chan, the Director General of WHO, said "It is horrific to think that an industry known for its dirty tricks and dirty laundry could be allowed to trump what is clearly in the public's best interests".[39]

Role of Civil Society

Other major achievements include strengthening of the international non-governmental movement against tobacco, for example, continuing and expanded world conferences on tobacco or health; the establishment of the International Network of Women Against Tobacco (established 1990);[40] the Framework Convention Alliance (1999);[41] the NCD Alliance,[42] and international web-based networks on tobacco. There has been a significant increase in research on the health effects and economic costs of tobacco, and on the behaviour of the tobacco companies.

Role of Employers

Tobacco is an occupational health and safety issue. Employers have a responsibility to provide a safe, healthy, smoke-free environment for employees in line with their duties of worker protection, reinforced by research studies on hospitality workers.[43-45] and policy guidelines from UN agencies,[46,47] and noting that such legislation does not cause economic harm or job losses.

Funding

Reducing the mortality rate for ischaemic heart disease and stroke by 10% would reduce economic losses in LMICs by an estimated US$25 billion per year, which is three times greater than the investment needed for the measures to achieve these benefits.[48] Since 2006, there has been a significant increase in funding from foundations, such as the Bloomberg Initiative to Reduce Tobacco Use in Low and Middle Income Countries,[49] the Bill and Melinda Gates Foundation[50] and others. Yet government funding remains inadequate, especially for the implementation of the WHO FCTC.

Obstacles to Tobacco Control

The obstacles to tobacco control are surprisingly similar around the world, and are summarised in Table 4.

Conclusion

It usually takes at least a century from identification to eradication of epidemics such as smallpox and polio, so perhaps it is not surprising that it is taking decades to eradicate tobacco use.

The harmfulness of tobacco in causing CVD is established beyond doubt. The epidemic is completely preventable through political will, and proven tools exist to reduce this epidemic. There have been great successes, such as reduction in smoking prevalence rates in many parts of the world, and the introduction and strengthening of tobacco control legislation and tobacco taxation.

A new paradigm is needed for CVD organizations and professional to address the CVD epidemic and their risk factors, such as supporting international treaties, laws and taxation.

In addition to the clinical role, the single most useful action any cardiologist in Asia can take to improve CVD health is to become engaged in full FCTC implementation.

Acknowledgements

We would also like to thank the American Cancer Society and the World Lung Foundation for permission to reproduce the maps from The Tobacco Atlas (Eriksen M, Mackay J, Ross H. *The Tobacco Atlas*. Fourth Ed. Atlanta, GA: American Cancer Society; New York, NY: World Lung Foundation; 2012, also available at tobaccoatlas.org.

Table 4. Obstacles to implementing tobacco control policies

1. Tobacco industry: promotion, distortion of health and economic evidence,* financial might, challenge/threats to governments and to tobacco control policy, tobacco-industry funded research, buying undue influence and the use of neo-libertarian front groups.
2. Lack of awareness of the risk or of the magnitude of risk of tobacco as a risk factor for CVD.
3. Preoccupation with diseases that may have much less serious consequences, or with war, natural disasters or the financial crises.
4. Comparative lack of active involvement by health (including CVD) professionals or CVD organisations in tobacco control.
5. Tobacco may not yet cause many deaths in some places where life expectancy is low.
6. Focus on curative medicine, not prevention.
7. Smoking may be seen as personal behaviour and human right.
8. Tobacco tax revenue (but not debit) seen by governments.
9. Misperceived concern about economic losses to the country, farmers and manufacturers if tobacco control measures taken.
10. Insufficient resources for research, surveillance and evaluation, implementation of laws, or to combat smuggling.
11. Difficulty for some governments to work with civil society, NGOs and academia.
12. Media may be uninformed or even offer 'equal time' to the industry.
13. No understanding of environmental consequences-fires, cutting down wood to cure tobacco, billions of cigarette ends, matches, lighters discarded daily.
14. The Millennium Development Goals make no mention of NCDs.
15. No targets.
16. Many laws have loopholes and are neither sufficiently specific nor comprehensive.#
17. Some educational messages are difficult to understand. There needs to be very clear, simple messages such as "Tobacco kills one in two smokers."[51]

*The 1990's United States court ruling to place tobacco industry documents in the public domain[52] showed that the tobacco industry has known all along their product is harmful, lethal and addictive, while publicly denying the evidence.
#An example is the most recent legislative mistake in Hong Kong, putting the legal onus on the smoker in the ban on smoking in restaurants and bars, an error still in place. Thus owners and managers have little incentive in maintaining smoke-free premises.

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Lipid Treatment Update

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HU and TOMLINSON: ***Lipid Treatment Update*****.** Statin therapy has become the mainstay of treatment for reduction of low-density lipoprotein cholesterol (LDL-C) to reduce cardiovascular risk and more intensive statin therapy provides additional risk reduction. Mono-therapy with statins may be insufficient in subjects with very high baseline LDL-C and some patients are intolerant of statin treatment or may have adverse drug interactions and more intensive statin treatment is associated with a small increase in the risk of developing diabetes. Combining statins with ezetimibe may result in more effective reduction of LDL-C but whether this combination results in improved outcomes compared to more intensive statin therapy remains to be proven. New forms of therapy to reduce LDL-C with monoclonal antibodies to proprotein convertase subtilisin/kexin 9 (PCSK9) or antisense oligonucleotides to apolipoprotein B-100 are currently under development and can result in more effective reduction of LDL-C. For patients with combined dyslipidaemia with elevation of triglycerides and lower levels of high-density lipoprotein cholesterol there are the options of adding niacin or fibrates. Beneficial effects have been seen in some outcomes with these treatments and ongoing studies may help to define the role of niacin in some patient groups. Some of these questions will be answered by the ongoing studies but optimization of lipid-modifying treatment for individual patients is likely to remain an uncertainty for many years to come. Statin therapy is likely to remain the cornerstone of treatment, but combinations with other drugs will become more popular. *(J HK Coll Cardiol 2012;20(Suppl 2):B47-B52)*

CETP inhibitors, ezetimibe, fibrates, niacin, statins

摘要

他汀類藥物治療已成爲降低低密度脂蛋白膽固醇（LDL-C）和減少心血管疾病風險的主要的治療方法，並且更強化的他汀類藥物治療能降低額外的風險。對於具有非常高基礎LDL-C的患者，單一的他汀類藥物治療可能不足。一些患者不能耐受他汀類藥物或可能會產生不良的藥物反應。更強化的他汀類藥物治療還會小幅增加患糖尿病的風險。聯合他汀類藥物和依澤替米貝可能會更有效的降低LDL-C，但與更強化的他汀類藥物治療相比，是否這樣的聯合能夠獲得更好的療效還有待證實。以降低LDL-C的單克隆抗體PCSK9或反義寡核苷酸載脂蛋白B-100是目前正在開發中的新形式的治療，可能會更有效的降低LDL-C。對於合併高甘油三酯和低水準高密度脂蛋白膽固醇異常的患者可選項添加煙酸或貝特類藥物。這些藥物治療的功效已經在一些研究成果中報導，正在進行的研究可能有助於明確煙酸在某些患者群體中的作用，並可能會解決某些問題，但在今後許多年裏能否做到個體化優化的脂質修飾治療可能仍然不確定。顯然他汀類藥物治療可能仍然是治療的基石，但與其他藥物的聯合治療將變得更加流行。

關鍵詞：CETP抑製劑，依澤替米貝，貝特類藥物，煙酸，他汀類藥物

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Current Pharmacological Therapy

Statins

There is extensive evidence from large clinical trials that reduction of low-density lipoprotein cholesterol (LDL-C) with the 3-hydroxy-methylglutaryl coenzyme A (HMG-CoA) reductase inhibitors or statins is effective in reducing cardiovascular events. The benefits of statin treatment in various patient groups, including primary and secondary prevention and patients with diabetes, have been demonstrated in several studies and in a number of meta-analyses,[1-3] and these findings have recently been extended to people at low risk of vascular events.[4] In a meta-analysis from the Cholesterol Treatment Trialists' (CTT) Collaboration comparing more intensive lipid lowering regimens with statins with less intensive regimens, the more intensive treatments produced significant additional reductions of 15% (95% CI 11-18; p<0.0001) in major vascular events, including reductions in coronary death or non-fatal myocardial infarction of 13% (95% CI 7-19; p<0.0001) and reductions in ischaemic stroke of 16% (95% CI 5-26; p=0.005).[5] However, it should be noted that in the SEARCH (Study of the Effectiveness of Additional Reductions in Cholesterol and Homocysteine) trial, despite an additional average reduction of LDL-C of 0.35 (SE 0.01) mmol/L with simvastatin 80 mg daily compared to 20 mg daily, there was no significant reduction in major vascular events and there was an increase in cases of myopathy in the 80 mg daily group.[6] A genome-wide association study in 85 subjects with definite or incipient myopathy and 90 controls taking 80 mg of simvastatin daily from that trial found a single strong association of myopathy with a single-nucleotide polymorphism (SNP) in the SLCO1B1 gene encoding the organic anion-transporting polypeptide OATP1B1, which regulates the hepatic uptake of statins.[7]

Statins have a range of pleiotropic effects in addition to lowering LDL-C and the JUPITER (Justification for the Use of statins in Primary prevention: an Intervention Trial Evaluating Rosuvastatin) study showed that the inflammatory marker high-sensitivity C-reactive protein (hsCRP) was an additional target for statin treatment,[8] and assessment of hsCRP has been adopted in some of the newer guidelines for lipid treatment. However, it remains controversial as to whether hsCRP should be regarded as a risk factor or risk marker.[9]

Although statins have become the mainstay of treatment for reduction of LDL-C to reduce cardiovascular risk and are generally very safe, adverse effects e.g. muscle toxicity from mild muscle symptoms to the most severe condition of rhabdomyolysis occur, especially with higher doses.[10] Moreover, the JUPITER study showed an increased risk of new onset diabetes with rosuvastatin 20 mg daily compared to placebo,[11] and a recent meta-analysis showed that more intensive statin treatment is associated with an increased risk of developing diabetes compared to less intensive treatment (Odds ratio: 1.12, 95% CI 1.04-1.22).[12] However, given the overwhelming benefit of statins in the reduction of cardiovascular events by 25% to 45%, the small absolute risk for development of diabetes is outweighed by the cardiovascular benefits in patients for whom statin therapy is recommended and the clinical practice for statin therapy should not be changed.[13]

In some patients with very high cardiovascular risk who have the lowest LDL-C targets or with very high baseline LDL-C such as those with familial hypercholesterolaemia, monotherapy with statins may be insufficient to achieve recommended goals. Combination therapy with other lipid-regulating agents might be required to further improve the lipid levels.[14]

Ezetimibe

Ezetimibe is a selective cholesterol absorption inhibitor, which reduces cholesterol levels by blocking the intestinal uptake of dietary and biliary cholesterol, without affecting absorption of fat-soluble vitamins or triglycerides.[15] When administered as monotherapy, ezetimibe 10 mg can reduce LDL-C by approximately 17% in patients with primary hypercholesterolaemia.[16] However, co-administration of ezetimibe with a statin provides addition reductions in LDL-C by about 15 to 20% compared with statin monotherapy because of their complementary mechanisms of actions as there is a significant and consistent increase of cholesterol absorption with statin therapy that is correlated with the inhibition of cholesterol synthesis.[16,17]

The early outcome studies with ezetimibe were disappointing as there appeared to be no benefit from the addition of this drug to simvastatin in the ENHANCE (Ezetimibe and Simvastatin in Hypercholesterolemia Enhances Atherosclerosis Regression) trial in the change in carotid-artery intima-media thickness in patients with familial hypercholesterolaemia,[18] and in the SEAS (Simvastatin and Ezetimibe in Aortic Stenosis) trial ezetimibe added to simvastatin did not reduce events related to aortic-valve stenosis.[19] In retrospect, both these trials had methodological problems and more recently the SHARP (Study of Heart and Renal Protection) trial was the first study to show significant reduction in major atherosclerotic events with lipid lowering treatment in a wide range of patients with advanced chronic kidney disease, in this case with simvastatin 20 mg plus ezetimibe 10 mg daily.[20] The IMPROVE-IT (Improved Reduction of Outcomes: Vytorin Efficacy International Trial) should help to clarify the role of ezetimibe in clinical practice.[21]

Niacin

Niacin has been used for the treatment of dyslipidaemia for over 50 years.[22] It has favorable effects on all traditionally measured lipid parameters, e.g. reducing LDL-C, triglyceride and lipoprotein(a) levels and raising high-density lipoprotein cholesterol (HDL-C).[23] Lipoprotein(a) has been recognized as an important risk factor which does not respond to other therapies.[24] The common side effects of niacin include vasocutaneous flushing, increased plasma glucose and uric acid levels and gastrointestinal adverse effects.[23] Several clinical studies have indicated that treatment with niacin, alone or in combinations mainly with statins, significantly reduces total mortality and coronary events and retards the progression of and may induce the regression of coronary atherosclerosis.[22, 23,25]

Treatments to increase HDL-C have been of great interest because of the strong inverse relationship between HDL-C levels and cardiovascular events in epidemiological studies.[26] This relationship appears to hold true even when LDL-C has been reduced with intensive statin therapy.[27] The ARBITER-6-HALTS (Arterial Biology for the Investigation of the Treatment Effects of Reducing Cholesterol-6-HDL and LDL Treatment Strategies) study demonstrated that in patients who had coronary heart disease (CHD) or a CHD risk equivalent, who were receiving long-term statin therapy, and in whom the LDL-C level was <2.6 mmol/L and HDL-C was <1.3 or <1.4 mmol/L for males and females respectively, niacin as add-on therapy to statin treatment resulted in a significant improvement in the surrogate endpoint of carotid intima-media thickness.[28] However, the recent AIM-HIGH (Atherothrombosis Intervention in Metabolic Syndrome with Low HDL/High Triglyceride and Impact on Global Health Outcomes) study showed that raising HDL-C levels by niacin did not result in additional reduction in cardiovascular events in patients receiving intensive statin therapy who had low baseline HDL-C levels and optimal LDL-C levels.[29] This result has generated debate on the utility of raising HDL-C levels in general and in particular with niacin therapy. Furthermore, recent mendelian randomisation analyses showed that SNPs that exclusively associate with HDL-C, such as the loss-of-function coding SNP at the endothelial lipase gene (LIPG Asn396Ser), do not seem to lower the risk of myocardial infarction whereas SNPs influencing LDL-C had effects concordant with those expected from observational studies, suggesting that a low HDL-C level *per se* may not be a true cardiovascular risk factor.[30] However, the AIM-HIGH study had some limitations and was underpowered to test the potential benefits of adding niacin to statin-treated patients considering the small difference in HDL-C between the treatment groups. Hopefully, the ongoing HPS2-THRIVE (Heart Protection Study 2: Treatment of HDL to Reduce the Incidence of Vascular Events) study that tests the effects of niacin with laropiprant, which inhibits the niacin-induced flushing reaction, and has randomised 25,000 participants including a large number of Chinese patients will demonstrate whether niacin is really effective in reducing events in addition to adequate statin therapy.[23]

Fibrates

Fibrates, such as fenofibrate, result in a substantial decrease in plasma triglycerides and this is usually associated with a modest decrease in LDL-C

and an increase in HDL-C concentrations.[31] However, in patients with high triglyceride levels, LDL-C levels may increase, probably due to an increase in LDL particle size.[14] Clinical studies of the effect of fibrates on cardiovascular disease have yielded mixed results, but the recent meta-analysis including more than 45,000 individuals with a broad range of baseline characteristics has shown that fibrate therapy produced a 10% relative risk reduction (95% CI 0-18%) for major cardiovascular events (p=0.048) and a 13% relative risk reduction (95% CI 7-19%) for coronary events (p<0.0001), but had no benefit on stroke (-3% relative risk reduction, 95% CI -16 to 9).[32] This analysis suggests that fibrates can reduces the risk of cardiovascular disease by preventing coronary events and clinically meaningful reductions in risk could be achieved in individuals at high risk of cardiovascular events and in those with combined dyslipidaemia. In the ACCORD (Action to Control Cardiovascular Risk in Diabetes) study, addition of fenofibrate to simvastatin in patients with diabetes did not result in significant reduction of cardiovascular events in the study overall, but there was a significant benefit in a pre-selected subgroup of patients with both high triglyceride and low HDL-C levels, which may be the obvious group to treat with this drug.[33]

Investigational Agents

Antisense Oligonucleotides to apo B

Apolipoprotein B (apo B) is an important structural and functional component of all atherogenic lipid particles and is required for the secretion of very low-density lipoprotein (VLDL) from the liver so reduction in apo B synthesis is expected to reduce circulating VLDL and LDL-C levels. Mipomersen (ISIS 301012) is an antisense oligonucleotide that targets apo B-100 and inhibits apo B production.[34] In a double-blind, randomized, placebo-controlled, dose-escalation study utilizing an initial dose of 50-400 mg followed by 4 weeks of additional multiple dosing of mipomersen (given intravenously and subcutaneously) with the same assigned dose in 36 volunteers with mild dyslipidaemia, mipomersen was associated with dose-dependent reductions in levels of apo B by up to 50% from baseline accompanied by a maximum 35% reduction of LDL-C.[35] Subsequent studies in patients treated with statins with LDL-C 100-220 mg/dl showed mipomersen 200 mg per week for 13 weeks reduced apo B and LDL-C levels by about 35%.[36] A further phase III study in patients with homozygous familial hypercholesterolaemia already taking maximum tolerated doses of conventional lipid-lowering drugs has revealed that mipomersen at 200 mg per week for 26 weeks provided a further mean 25% decrease in LDL-C levels.[37] The most common side effects of mipomersen are injection site reactions (70%-100%), flu-like symptoms (29%-46%), and elevated transaminases associated with an increased liver fat content (6%-15%).[34]

PCSK9 Antibodies

The discovery that mutations and polymorphisms in the gene for proprotein convertase subtilisin/kexin 9 (PCSK9) modulate expression of the LDL receptor and are associated with changes in LDL-C, familial hypercholesterolaemia and coronary artery disease was an important development in the understanding of lipid metabolism processes.[38,39] This has led to the development of biological agents that can influence this protein and initial studies with a monoclonal antibody to PCSK9 from Regeneron Pharmaceuticals called REGN727 given intravenously or subcutaneously showed effective reductions in LDL-C with a good safety profile.[40] Another compound AMG 145 from Amgen, which is a fully human monoclonal immunoglobulin G2 antibody that binds specifically to human PCSK9, is being tested in the LAPLACE-TIMI 57 (LDL-C Assessment with PCSK9 Monoclonal Antibody Inhibition Combined With Statin Therapy-Thrombolysis In Myocardial Infarction) trial.[41] Several other monoclonal antibodies targeting PCSK9 in the circulation are also under development e.g. RN316 IgG (Pfizer-Rinat) and 1D05-IgG (Merck).[14] In phase I studies in healthy subjects and phase II studies in patients with hypercholesterolaemia treated with statins, these PCSK9 antibodies given intravenously or subcutaneously significantly reduced LDL-C levels by up to 70% relative to placebo with no evidence of drug-

related adverse events observed.[42] These initial promising data indicate that pharmacologically induced PCSK9 inhibition is efficacious in the reduction of LCL-C levels and future outcome studies are needed to determine the beneficial effects of PCSK9 inhibition on CVD risk reduction.

Cholesteryl Ester Transfer Protein Inhibitors

The inhibitors of cholesteryl ester transfer protein (CETP) have provided a novel approach to increase HDL-C, and with some of the drugs in this group additional substantial reductions in LDL-C can also be achieved. However, the findings in the ILLUMINATE (Investigation of Lipid Level Management to Understand its Impact in Atherosclerotic Events) study with torcetrapib of an increased risk of cardiovascular events (hazard ratio [HR], 1.25; 95% CI 1.09-1.44; p=0.001) and increased all-cause mortality (HR, 1.58; 95% CI 1.14-2.19; p=0.006) despite a 72% increase in HDL-C and 25% decrease in LDL-C resulted in the withdrawal from development of that drug.[43] The increased risk appeared to be due to off-target effects causing increases in systolic blood pressure and serum aldosterone and the other CETP inhibitors do not seem to have these effects. Development continues with the two remaining CETP inhibitors, anacetrapib and evacetrapib, which appear to be more effective in increasing HDL-C and decreasing LDL-C than was the case with dalcetrapib, which was also withdrawn from development earlier this year because of apparent lack of efficacy in the phase III study.[44,45]

Conclusion

Statins have proven to be the most effective lipid modifying treatment and are likely to continue to occupy this position for the foreseeable future. Intensive statin therapy provides additional cardiovascular benefits but with increased risk of myopathy and a slight increase in the risk of new onset diabetes. Additional lowering of LDL-C can be achieved by combining statins with ezetimibe and combinations of statins with niacin or fibrates can further improve triglyceride and HDL-C levels. The exact role of these combinations still requires clarification from ongoing clinical trials. The investigational agents including CETP inhibitors, antibodies to PCSK9, antisense oligonucleotides to apo B-100 and other agents in development offer the exciting prospect of further modification of lipid risk factors and reduction of cardiovascular events in the years to come.

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