ABSTRACTS

Abstracts Presentation (Poster):

1.

Chronic Kidney Disease, Especially Proteinuria, is a Powerful Predictor for Cardiovascular Events in High-Risk Hypertensive Patient

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Objective: Chronic kidney disease (CKD) is associated with cardiovascular (CV) morbidity and mortality as well as loss of renal function. In this context, we aimed to evaluate the effect of proteinuria and the level of estimated glomerular filtration rate (eGFR) on CV events rate in high-risk hypertensive patients as a subanalysis of CASE-J (Candesartan Antihypertensive Survival Evaluation) trial.
Method: The CASE-J trial enrolled 4,728 high-risk Japanese hypertensive patients, who were randomly assigned to candesartan- or amlodipine-based treatment regimens. This trial disclosed that both two treatment regimens equally suppressed the incidence rates of CV events. Thus, we analyzed the data as an observational study irrespective of allocated drugs. CKD was defined as proteinuria (PU) and/or decreased eGFR (<60 ml/min/1.73 m^2) at enrollment. We divided CASE-J patients into two groups (without CKD: n=1983, with CKD: n=2720), and also evaluated the effect of proteinuria and the level of eGFR (cut-off point: 60 ml/min/1.73 m^2) on CV events rate (Group A: PU(-) and eGFR≥60, n=1983, B: PU(-) and eGFR<60, n=1815, C: PU(+) and eGFR≥60, n=330, D: PU(+) and eGFR<60, n=575). Hazard ratio (HR) was calculated with multivariable Cox regression analysis adjusted for difference of baseline characteristics.
Results: During 3.2 ± 0.9 years of follow-up, 201 (7.4%) patients with CKD experienced CV events and 67 (3.4%) patients without CKD did (HR: 2.08, 95%CI: 1.57-2.76). In a subgroup analysis, 67 (3.4%) patients in Group A, 95 (5.2%) in Group B, 31 (9.4%) in Group C and 75 (13.0%) in Group D experienced CV events (Group B; HR: 1.38, 95%CI: 1.00-1.90, Group C; HR: 3.07, 95%CI: 2.00-4.70, Group D: 4.00, 95%CI: 2.85-5.59 vs. Group A). These results indicated that proteinuria has an adverse impact on CV events rate independent of the level of eGFR.
Conclusion: The present study shows that CKD, especially proteinuria, is a powerful predictor for CV events. Accordingly, we should pay more attention to presence or absence of proteinuria in risk stratification in high-risk hypertensive patients.

2.

Predictive Values of Blood Pressure Indexes for Cardiovascular Events in High-Risk Hypertensive Patients: A Subanalysis of Case-J Trial

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Objective: Hypertension is the most common risk factor for cardiovascular (CV) events. Systolic blood pressure (SBP), diastolic blood pressure (DBP) and pulse pressure (PP) have been reported to be the predictors of CV events. However, there is no consensus as to which is best. Thus, we aimed to compare the associations of SBP, DBP, and PP levels at enrollment with the incidence of CV events in high-risk hypertensive patients as a subanalysis of Candesartan Antihypertensive Survival Evaluation in Japan (CASE-J) trial.
Methods: We analyzed data of 4,703 patients from CASE-J trial who were randomly assigned to either candesartan - or amlodipine-based regimens. We used the multiple Cox regression analysis to estimate the hazard ratio (HR) for CV events adjusted for baseline characteristics. Improvement of likelihood ratio was calculated to compare the predictive utility for CV events among three BP indexes. To perform pairwise comparison, two of three BP indexes were subsequently included in the multiple Cox regression analyses.
Results: The exceptional BP control (less than 140/80 mmHg) was achieved in the present study. Of 4,703 patients (mean age: 63.8 years), 268 (5.7%) patients experienced CV events for a rate of 17.7 per 1000 person-years during 3.2±0.9 years of follow-up. HR for CV events per 1SD increase of SBP, DBP, and PP were 1.19 (95%CI; 1.04-1.36), 0.79 (95%CI; 0.69-0.90), and 1.35 (95%CI; 1.19-1.53). Improvement of likelihood ratios were 6.1, 11.7, and 20.7, respectively. Pairwise comparison revealed that SBP and DBP were not positively associated with CV events in models with PP, whereas a positive relationship with PP was still observed.
Conclusion: The present study showed that PP has a stronger predictive utility for CV events than SBP and DBP in high-risk hypertensive patients. These findings supported the concept that increased PP was associated with advanced atherosclerosis and target organ damage.

ABSTRACTS

Abstracts Presentation (Poster):

3.

The Role of the Health Fitness Programmer for Cardiac Rehabilitation in a General Hospital

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Background: Since 2006, our general hospital, which has 95 beds, has been insurance-approved for Cardiovascular Rehabilitation (CR). In our hospital, 2 Health Fitness Programmers (HFP) are engaged in CR. Although HFP were originally working at sports facilities and fitness clubs, up to 40% of HFP have now begun to work for medical institutions. We will consider the ideal future for HFP in general through examining the operation of our HFP.
Current state: Our HFP are engaged in providing CR and exercise training for patients with diabetes mellitus while in hospital. Also, they work as exercise instructors in our facility in accordance with Article 42 of the Medical Care Law and in a nursing-care facility as exercise trainers. The actual numbers of exercise training given for CR, patients with DM, patients in a facility in accordance with Article 42 of the Medical Care Law, and patients in a nursing-care facility per week were 32, 18, 21, and 4 cases, respectively. Our HFP give questionnaires to their patients periodically, both to improve their exercise instruction, and to revise their exercise programs. Accordingly, patients have not become bored with their physical training, because their requests about exercise programs changes have been accepted.
Perspective: Since other medical staff members are unfamiliar with giving instructions for special physical training and resistance training, HFP should take a major role in these fields. In addition, we are ready to forge a medical partnership with fitness clubs or health promotion facilities. When the partnership is achieved, HFP will mainly concentrate on developing and maintaining good working relationships.
Conclusion: HFP are expected to be important leaders in the fight against lifestyle-related disease and in preventing ischemic heart disease. As the number of HFP who are hired into positions as medical staff leaps upward, HFP should begin to combine both advanced skills in exercise training and comprehensive medical knowledge.

4.

The Accuracy of the New Portable ECG Monitor, HCG-901 and Its Usefulness in Cardiac Rehabilitation

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Purpose: As portable ECG monitors are more commonly used nowadays, we evaluated the accuracy of the non-transmission portable ECG monitor, HCG-901 (Omron Healthcare Co., Ltd.) for clinical use and the usefulness of the monitor on non-supervised cardiac rehabilitation.
Method: Ten subjects with the convalescent phase of cardiac diseases (7 males aged 60±8) were enrolled. 1) ECG was recorded simultaneously with HCG-901 and ECG monitoring device during supervised exercise training. Those records were compared with the ones from the other ECG monitoring device. 2) ECG was recorded with internal or external electrodes during exercise training at home, on awakening, after dinner, before bedtime or on the occurrence of subjective symptoms.
Results: 1) The records from both devices were very much concordant regarding R-R interval (r=0.98), QRS complex (r=0.98), T-wave amplitude (r=0.95) and R-wave amplitude (r=0.81), including the ones recorded during exercise. Thirteen cases (26%) of VPC, SVPC as well as ST segment depression recorded during exercise were detected. 2) Patients recorded ECG as followings: Duration: 9.2±2.9 days, Number of records: 53±23, Total number of records: 527. Eight cases of VPC, paroxysmal atrial fibrillation, SVPC, sinus bradycardia or ST segment depression during exercise training were detected. ECG was recorded during exercise training at home while keeping the heart rate between 99.0±11.3.
Discussion: The comparison suggests that ECG recorded with HCG-901 is quite accurate and the analysis result was credible. With the simplicity in use, HCG-901 is expected to be a useful monitoring tool for cardiac rehabilitation.

ABSTRACTS

Abstracts Presentation (Poster):

5.

Profitability of the Japanese Cardiovascular Rehabilitation System for a Small General Hospital

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Background: Since 2006, our small general hospital, which has only 95 beds, has been insurance-approved for Cardiovascular Rehabilitation (CR). In these small hospitals, maintaining the profitability of medical practice is very important. We calculated the balance of payments of CR performed in our hospital in order to evaluate the profitability of Japanese CR system for small general hospitals.
Method: After establishing the CR system in our hospital, we assessed the total income and expenditure for CR. Total income consisted of all fees charged for CR, CR planning, exercise testing, exercise prescription, drug administration guidance, nutritional guidance, and discharge guidance. Total expenses consisted of equipment purchase expenses, depreciation expenses, supply expenses, and personnel expenses.
Results: Persistent CR (more than 70% of persistence rate) was performed for 55 patients. Settlements of balance per month including 1) the number of CR cases, 2) total revenue, 3) total expenditure, and 4) profit rate were as following: ($1.00 = ¥107)

In fiscal 2006,	1) 86.7 cases,	2) $6,075,	3) $3,147,	4) 48.2%.
In fiscal 2007,	1) 142.8 cases,	2) $8,203,	3) $3,132,	4) 61.8%.
And for 2008,	1) 137.0 cases,	2) $7,867,	3) $3,127,	4) 59.9%.

We could carry out highly profitable CR in a small hospital because of insurance-approval of our facility for criterion I (high grade), using existing medical instruments and existing manpower, and by maintaining a highly persistent rate of CR.
Conclusion: When the CR system is established in a small hospital, it is important to consider profitability as well as necessity. Using our original equipment and manpower, we were able to demonstrate highly persistent and profitable CR. This shows that even in small hospitals, highly profitable CR can operate.

6.

Disclosure of Information on the Internet about Cardiac Rehabilitation in Insurance-Approved Institues in Japan

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Background: Recently, many kinds of information have become available through the internet about the various medical fields. We evaluated the quality and quantity of information available on the Internet about cardiac rehabilitation (CR) in Japanese insurance-approved institutes.
Methods: There are 143 Japanese insurance-approved institutes of CR which are registered on the website of the Japanese Association of Cardiac Rehabilitation (JACR). We evaluated the following data through the web-sites of each institute: 1) the numbers of cardiologists and cardiovascular surgeons, 2) the numbers of registered cardiac rehabilitation masters, 3) the annual numbers of patients with percutaneous coronary intervention (PCI) and patients with cardiac surgery, 4) the annual numbers of patients receiving CR, 5) contents of the CR. We assessed the description rates for each of these information items.
Results: Although the mean description rates of the numbers of cardiologists and cardiovascular surgeons were 79% and 67% respectively, the mean description rate of the numbers of registered cardiac rehabilitation masters was only 11% ($p < 0.0001$). Moreover, while the mean description rates of the annual numbers of patients with PCI and cardiac surgery were 63% and 52% respectively, but the mean description rate of the annual numbers of patients receiving CR was only 13% ($p < 0.0001$). Only 46% of the institutes introduced their CR system at all.
Conclusion: In conclusion, even for the insurance-approved institutes of CR which are registered on the website of the JACR, their description rates about CR on their websites are not very high. Disclosure of information about CR on the Internet should be strengthened in order to promote improved CR in Japan.

ABSTRACTS

Abstracts Presentation (Poster):

7.

The Relationshop Between the Intensity of Systemic Hypoxia and Cardiac Autonomic Activity Induced by Physical Stimulation

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Objective: This study investigates how various hypoxic interventions affect cardiovascular autonomic activities during posture change and the Valsalva maneuver.
Materials and Methods: Ten healthy sedentary men exposed to 12%, 15% and 21% O_2 for 1 hour in a normobaric hypoxia chamber in a random order. Before and 3o min after various O_2 concentrations were administered, subjects performed the sit-up test and the Valsalva maneuver. A spectral analysis of heart rate variability and cardioacceleration response to posture change as well as Valsalva ratio were performed to determine the cardiac autonomic activity.
Result: While the patient rested in a supine position, exposure to 12% O_2 reduced total power and high frequency (HF) and increased low frequency (LF) and the ratio of LF to HF. Furthermore, this hypoxic exposure simultaneously(i) lowered the changes of time and frequency domains in HRV and cardioacceleration response induced by the sit-up test. (ii) attenuates the HR responses to the Valsalva maneuver. However, resting and posture change-induced HRV and heart rate response values were not influenced by both 15% and 21% O_2 exposures.
Conclusion: Acute hypoxic exposure affects cardiac autonomic activities, with reactions determined by the intervening O_2 concentrations. Exposure to 12% O_2, but not 15% O_2, down-regulates cardiac autonomic responses to posture change and the Valsalva manever.

8.

Does the Dialysis Arteriovenous Fistula Possess Homogeneous Mechanical Properties?

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Objectives: To prove that different local hemodynamic characteristics and physical factors cause different clinical manifestations at different segments in the arteriovenous fistula (AVF).
Materials and methods: Six stage 5 chronic renal failure patients, aged about 57 years old, were recruited in a tertiary care hospital. Four of them had patent radiocephalic anastomosis and the remaining had patent brachiocephalic anastomosis. Another four similar aged patients underwent percutaneous transluminal angioplasty owing to radiocephalic shunt stenosis were also enrolled. Peak systolic and end diastolic velocities, diameter at end diastolic phase, intima-media wall thickness, and the maximum strain at the arterial inflow (Segment *a*), venous anastomosis (Segment *b*), 1 cm downstream from the anastomosis (Segment *c*), midway between the anastomosis and the needlepuncture site (Segment *d*) and needle access region (Segment *e*) were measured with ultrasonography. Pressure recording at the above five locations in the other four patients was done after successful treatment of AVF stenosis. A mathematical model was derived to approximate the intra-access pressure from the brachial artery pressure of uninvolved limbs. Elastic modulus in each segment can then be calculated.
Results: The peak systolic and end diastolic velocities increased after entry into the fistula and the greatest values were 236 cm/s and 128 cm/s respectively at Segment *c*. They decreased after leaving this area. The maximum strain had the similar trend as the flow velocity. The greatest value was 4.22% at Segment *c* and the least value was 1.11% at Segment *e*.
Conclusion: Ultrasonography can successfully evaluate regional hemodynamic characteristics and mechanical properties in the dialysis access. The AVF behaves heterogeneously at different segments.

ABSTRACTS

Abstracts Presentation (Poster):

9.

Effects of Long-Term Exercise with Medium Intensity on Heart Function of Mice and Possible Mechanisms Approach

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Study Objective: Epidemiology data demonstrate that regular exercise can reduce the morbidity and mortality of cardiovascular diseases by 40-50%. One of the mechanisms known is exercise induced myocardial protection. However, the exact mechanisms of myocardial protection are not clear yet. In this study, the effects of long-term exercise with medium intensity on cardiac function, as well as the effects on heat shock proteins (HSPs) and hypoxia-inducible factor-1α (HIF-1α) expression in mouse myocardium were explored. Possible mechanisms of exercise induced myocardial protection were discussed.

Materials and Methods: Sixteen wild-type mice were randomly divided into two groups: control group (n=8) and exercise group (n=8). The mice in exercise group were forced to run with medium intensity on a treadmill for one hour per day, five days per week. All the treatments in control group are the same as in the exercise group except no running exercise involved. After 10 weeks of intervention, (1) mice cardiac function and heart weight were analyzed by echocardiography; (2) left ventricle weight and tibia length were measured after the mice were sacrificed; (3) the medium part of the left ventricle were used for morphology analysis by hematoxylin & eosin (HE) staining and light microscope imaging; (4) the upper part of left ventricle were used for HSPs and HIF-1α gene expression analysis by RT-PCR or quantitative PCR.

Results: (1) Compared to control group, interventricular septum (IVS) (1.22±0.13 vs 0.80±0.09 P<0.01), posterior wall of left ventricle (LVPW) (1.28±0.30 vs 0.79±0.09 P<0.01) of exercise group were significantly thicker; ejection fraction (EF) (90.0±3.16 vs 81.6±7.26 P<0.01) and left ventricular shortening fraction (FS) (53.4±3.28 vs 47.2±5.71 P<0.05) were dramatically elevated. (2) Both left ventricle weight to body weight ratio (6.3±0.74 vs 5.0±0.61 P<0.01) and left ventricle weight to tibia length ratio (12.7±1.35 vs 10.2±2.22 P<0.05) were significantly higher of exercise group than those of control group. (3) Light microscope observation showed that cardiac muscle fibers of exercise mice were thickened and cardiomyocytes were augmented than those of control mice. (4) HSP70 (0.59±0.24 vs 2.36±0.32 P<0.01), HSP90 (0.65±0.31 vs 2.29±0.47 P<0.01), HSP 27 (0.98±0.54 vs 2.15±1.22 P<0.05), αβ-lensprotein (0.84±0.39 vs 2.16±1.45 P<0.05) mRNA expression in exercise group were significantly higher than those of control group; HIF-1α expression in exercise group was increased by 1.78-fold compared to control group(P<0.01).

Conclusion: Long-term exercise with medium intensity caused myocardial hypertrophy and better heart function in mice. Inducing HSPs and HIF-1α expression in myocardium by exercise might be one of the possible mechanisms.

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10.

Measuring Self-Care of Chronic Heart Failure

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Objective: There is more evidence to indicate that self-care is the cornerstone of therapy in managing chronic heart failure (CHF). Self-care refers to the beahviors that the patient engages in and the decision they make about activities that promote health and limit illness. A reliable and valid measure for CHF-related self-care is crucial for assessing patients' ability in managing the disease and evaluating the adequacy of health services. The purpose of this study was to conduct psychometric evaluation on the Self-Care Heart Failure Index (SCHFI) and the European Heart Failure Self-care Behavioral Scale (EHFScBS) in the Chinese CHF patients.

Methods: A purposive sample of 19 CHF patients were recruited from a hospital and a community settings for focus group interviews. Their views on CHF-related self-care were used to conduct cross-cultural adaptation of the two tested instruments. Another 143 community-dwelling CHF patients were recruited for conducting the psychometric evaluation. The main outcome measures involved the Chinese versions of SCHFI and EHFScBS. The Medical Outcomes Study Social Support Survey (MOS-SSS-C) and the Hospital Anxiety and Depression Scale (HADS) were used for construct validation.

Results: A few SCHFI and EHFScBS items were modified to optimize their cultural relevancy. The Chinese versions of SCHFI and EHFScBS had content validity indices as 0.89 and 0.93, and Cronbach's alphas as 0.82 and 0.73, respectively. Construct validity was supported by their respective significantly correlations with the MOS-SSS but not with the HADS. The low level of psychological distress among the sample may mask such theoretically porpurted relationships. Confirmatory factor analysis supported the 3-factor structure of the SCHFI in measuring self-care maintenance, self-care management and self-care self-confidence.

Conclusion: The Chinese version of SCHFI and EHFScBS are culturally relevant, reliable and valid tools for use in CHF patients. Whereas the SCHFI can be used to gather precise information about how to enhance self-care of CHF patients, the EHFScBS provides a brief measure for service evaluation. These two instruments are complementary to each other and allow a better understanding of the self-care of CHF patients.

ABSTRACTS

Abstracts Presentation (Poster):

11.

Type D Personality in Chinese Patients with Coronary Artery Disease

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Objective: Increasing evidence supports the prognostic impact of Type D personality (i.e., increased negative emotions paired with emotional non-expression) in patients with coronary artery disease (CAD). This study aimed at estimating the prevalence of Type D in Chinese patients with CAD and performing cross-cultural validation of the DS14 in the Chinese culture.
Method: Patients with CAD (N=326) were recruited from a regional university-affiliated hospital and invited to complete the Chinese version of the DS14. The NEO Five Factor Inventory (n_1=120), the Hospital Anxiety and Depression Scale (HADS) and the Stress Symptom Checklist (SSC) (n_2=66) were administered to sub-samples to establish construct and discriminant validity, respectively. Administration of the DS14, HADS and SSC was repeated at one month after hospital discharge (n_2=66). Stability of the DS14 was examined by repeating data collection with another sub-sample (n_3=100).
Results: The prevalence of Type D personality was 31% in Chinese patients with CAD. Confirmatory factor analysis indicated that there was no cross-cultural variation in the theoretical structure of Type D personality [χ^2/df= 2.89, RMSEA=0.08, Normal fit index = 0.91, Non-normal fit index=0.91, Comparative fit index = 0.93]. The Negative Affectivity and Social Inhibition subscales of the DS14 were internally consistent (α=0.89/0.81), measured stable traits (3-month test retest ICC=0.76/0.74), and demonstrated significant correlations with the NEO-FFI neuroticism (r=0.78) and extraversion (r=-0.64) subscales, respectively. They also discriminated themselves from the more transient emotional states, as the Negative Affectivity and Social Inhibition scores remained unchanged in patients who reported significant improvement in depressed mood and stress level over the first month of hospital discharge.
Conclusion: Type D personality is a prevalent personality trait in Chinese people with CAD. This study suggests that the DS14 is a valid, reliable, and internally consistent measure when used in the Chinese population. Studies are now warranted examining the prognostic risk of Type D personality in Chinese people with CAD.

12.

Return to Work after Coronary Disease – A Retrospective Review

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Objectives: To review the rate of "return to work" of patients after completion of cardiac rehabilitation program.
Method: It was a retrospective study covering the period from 01/01/2006 to 31/12/2007. Patients engaged in remunerative jobs prior to the onset of coronary disease were recruited for work status and job nature analysis. Data were collected at 1) Program entry; 2) End of the 8 weeks program; and 3) One year post training.
Results: In the review period, a total of 160 patients had completed the cardiac program in Tung Wah Hospital. Age ranged from 33 to 87 (mean 62±11.7); gender distribution was 127 male and 33 female. Among the 160 patients, only 47% (n=75) was working prior to admission. Age ranged from 33 to 81 (mean 55±9.9); gender distribution was 70 male and 5 female. By the end of 8 weeks' program, 86.7% (n=65) were able to return to previous or other work; only 9 patients changed the job nature due to cardiac related reasons.

The job natures of the subjects are illustrated in following table:

Job nature	Manual laborer	Technical	Clerical	Management	Professional
Before onset of CHD	14	15	8	24	14
After 8-weeks program	10	11	8	22	14
After 1 year	7	11	7	22	13

Amongst the 60 subjects still maintained their work after one year, 11 were over 65 years old and still working for their life expenses.
Conclusion: According to Mital (2004), return to work is one of the important markers of the success of cardiac rehabilitation. The work simulation training and work counseling of our program helped to assist clients to face their limitation of physical ability and psychological stress; eventually resumed their work. This was reflected by the relatively high rate of return to work (80%). Our result also showed that age above 65 was still able to sustain their job.

This review indicated our sample tended to skew towards older population (62±11.7) as the tren for aging population. The younger clients who would benefit from such program might be missed because of some other reasons such as lack of time to participate in a cardiac rehabilitation program. Modified rehabilitation program tailored for this group of client could be our future direction.