

GW29-e0403**A Novel Cost-Effective Non-Invasive Imaging Criteria For Detection Of Hypertrophic Cardiomyopathy In Elite Athletes**

Diana Foo Hui Ping,¹ Lam Kai Huat,² Adam Bin Bujang,¹ Andrew Kilung,³ Sally Suriani Ahip,⁴ Ong Tiong Kiam,³ Alan Fong Yean Yip^{1,3}

¹Clinical Research Centre, Sarawak General Hospital, Kuching, Sarawak; ²Assunta Heart Centre, Petaling Jaya, Selangor Darul Ehsan; ³Department of Cardiology, Sarawak General Hospital Heart Centre, Kota Samarahan, Sarawak; ⁴Klinik Kesihatan Kota Sentosa, Kuching Sarawak

OBJECTIVES Left ventricular hypertrophy (LVH) is common in elite athletes in response to physiologic stimuli from regular, high-intensity exercise. Severe LVH, such as seen in patients with pathological hypertrophic cardiomyopathy (pHCM), has been associated with sudden death. The utility of echocardiography in distinguishing physiological and pathological LVH has been widely studied. However, data on echocardiographic criteria to detect pHCM in elite athletes has not been well-established. We aim to assess echocardiographic variables associated with left ventricular (LV) function in the detection of pHCM in athletes.

METHODS A total of 84 subjects, 27 healthy controls (HC), 14 patients with hypertensive LVH (HTN-LVH), 14 patients with true pHCM and 27 professional footballers from a State Level Football Association in Malaysia were enrolled. All subjects were male. LV ejection fraction (LVEF) obtained was preserved in all subjects. For each subject, 16 echocardiographic parameters of diastolic dysfunction and 5 parameters of LV dimensional assessment and LVH were obtained, and referenced against internationally recognised parameters. Speckle-tracking echocardiography was performed to obtain global longitudinal strain (GLS).

RESULTS After adjusted to age, patients with pHCM had significantly ($p < 0.001$) higher LA volume index (mean $54.4 \pm 22.7 \text{ ml/m}^2$ vs $22.5 \pm 6.4 \text{ ml/m}^2$ in HC vs $27.8 \pm 6.1 \text{ ml/m}^2$ in footballers vs $32.4 \pm 10.4 \text{ ml/m}^2$ in HTN-LVH); higher LV mass index (mean $186.6 \pm 91.1 \text{ g/m}^2$ vs $84.8 \pm 16.9 \text{ g/m}^2$ in HC vs $101.7 \pm 19.6 \text{ g/m}^2$ in footballers vs $115.7 \pm 26.6 \text{ g/m}^2$ in HTN-LVH); higher TDI E/e' ratio (mean 16.5 ± 6.1 vs 9.1 ± 3.9 in HC vs 7.8 ± 1.6 in footballers vs 12.2 ± 4.3 in HTN-LVH); lower GLS (mean $-10.7 \pm 3.5\%$ vs $-20.5 \pm 2.3\%$ in HC vs $-21.1 \pm 1.7\%$ in footballers vs $-21.2 \pm 2.9\%$ in HTN-LVH).

On ROC analysis, LV mass index $> 122.2 \text{ g/m}^2$ (AUC=0.921; $p < 0.001$); sensitivity 83.3% specificity 90.5% LA volume index $> 34.7 \text{ ml/m}^2$ (AUC=0.937; $p < 0.001$); sensitivity 83.3% specificity 85.7%, TDI E/e' ratio > 11.57 (AUC=0.866; $p < 0.001$); sensitivity 75% specificity 84.1% and GLS $< -15.35\%$ (AUC=1.000; $p < 0.001$; sensitivity 100% specificity 100%) were found to have better discriminatory abilities in distinguishing pHCM from other variants of LVH.

CONCLUSIONS LV mass index, LA volume index, TDI E/e' ratio and GLS were found to be more strongly associated with pHCM. Therefore, we recommend athletes with LVH who were detected with these echocardiographic variables exceeding the cut-off values found in our population to undergo comprehensive cardiovascular assessment before undertaking strenuous exercise.

GW29-e0443**Comparative effects of renin angiotensin system inhibitors on vaginal vascular remodeling and fibrosis in female hypertension**

Ruixin Ma, Yang Zhao, Xiaorong Yu, Ningyin Li, Xu Zhao, Xiaowei Zhang, Jing Yu
Lanzhou University Second Hospital

OBJECTIVES Female sexual dysfunction (FSD) is more frequently encountered in hypertensive women. This research intends to compare the potential beneficial effects of Angiotensin converting enzyme inhibitors (ACEI) and Angiotensin receptor 1 antagonists (ARB) on vascular remodeling and fibrosis in female lower genital tract, to provide evidences for the choice of therapy in hypertensive women with FSD.

METHODS Twelve-week old female SHR and WKY rats were allocated to four groups: SHR (N = 9) received no treatment but vehicle; SHR + Irb (N = 9) received Irbesartan; SHR + Ben (N = 9) received Benazepril; and control WKY (N = 9) received vehicle. After 12 weeks, vaginal tissues were excised for real-time PCR and western blot analysis.

RESULTS Vaginal RAS expression altered in untreated SHR compared to WKY. A reduction of AT1R expression was observed in SHR + Irb and SHR + Ben. Irbesartan up regulated AT2R, MasR and ACE expression, and remarkably increased ACE2 expression. On the contrary, AT2R, MasR and

ACE expression were down regulated in SHR+Ben group. Significant increase of vaginal α -SMA was observed in untreated SHR as compared with WKYs, also the reduction of eNOS. Both irbesartan and benazepril elicited a marked decrease in vaginal α -SMA expression, and caused increments of eNOS expression. There was no significant difference in vaginal α -SMA and eNOS in SHR+Irb and SHR+Ben. However, vaginal Col III was lower in SHR+Ben compared with SHR+Irb, which was decreased slightly compared with untreated SHR.

CONCLUSIONS Despite the different influences on RAS, ACEI and ARB have similar positive effects against oxidative stress and vascular remodeling in female lower genital tracts. However, Benazepril decreased vaginal Col III more than Irbesartan. Both ARB and ACEI are reasonable antihypertensive agents for women with FSD.

GW29-e0521**Adaptation of cardiovascular system to work in the night shifts of doctors and nurses**

Konstantin Apykhtin,¹ Illya Chaikovskiy,² Svetlana Yaroslavskaya,³ Anna Starynska,⁴ Leonid Stadnyk²

¹State Institution "Kundiev Institute of Occupational Health of the National Academy of Medical Sciences of Ukraine", Kyiv, Ukraine; ²Glushkov Institute of cybernetics, Kiev, Ukraine; ³Bogomolets National Medical University", Kyiv, Ukraine; ⁴Cardiolyse Oy, Helsinki, Finland

OBJECTIVES Work in the night shifts breaks down natural biorythms, leading to the development of desynchronization, a decrease in melatonin synthesis, a violation of autonomic regulation, arterial hypertension, obesity, insulin resistance, immune system dysfunction and the development of tumor pathology. However, quantitative indicators of cardiovascular system adaptation to work at night shifts, the neuro-emotional strain caused by labor intensity, gender peculiarities of the cardiovascular system, and, generally speaking, physiological cost of the work, remain insufficiently studied.

METHODS The heart rate variability (HRV) analysis as well as comprehensive analysis of 6-leads ECG was performed in doctors (men (n=7) and women (n=9)) and nurses (women (n=18)) at the beginning and the end of daily duty was done with the help of cloud analytical platform Cardiolyse. The correlation analysis, using both linear and rank correlation was used.

RESULTS It was found that in male doctors the intensity of the shift load (the number of night shifts per month, NNSM) positively correlated with the shift of autonomic balance LF/HF towards sympatheticotonia. Female physicians showed a positive correlation of NNSM with the increase in the absolute and partial activity of the subcortical sympathetic nerve centers (VLF, VLFn), index of activation of the subcortical nerve centers (VLF/HF), the centralization index [IC = (VLF+LF)/HF], total HRV (measured by SDNN), autonomic circuit activity (parasympathetic modulation) (RMSSD, pNN20). At the same time, the nurses' (female) experience of working in night shifts was positively correlated with an increase in the specific activity of the baroreflex center of the medulla oblongata [LFn(%) = LF*100/(VLF+LF+HF)].

Moreover, many ECG parameters shown significant correlation with NNSM in both male and female groups, for example ST shift, P-wave amplitude, sum amplitude of QRS-complex etc.

CONCLUSIONS The obtained results indicate, firstly, the gender difference in the mechanisms of adaptation to work in night shifts. Secondly, in women doctors, unlike women nurses, there is a greater number of reliable correlation between the intensity of the load of night shifts and shifts of vegetative homeostasis, which can be regarded as the specific features of adaptation to more strained doctors' work, compared with nursing work.

GW29-e0549**Meta-analysis of mechanical versus manual chest compressions in cardiopulmonary resuscitation**

Hui Li, Junlin Wu, Yongwei Zhang, Xiaoli Jing
The First Affiliated Hospital of Sun Yat-Sen University

OBJECTIVES The aim of this paper was to conduct a meta-analysis of the published literatures comparing the use of mechanical chest compression device and manual chest compression during cardiac arrest (CA) with respect to short-term survival outcomes and neurological function.

METHODS Databases including MEDLINE, EMBASE, Web of Science and the ClinicalTrials.gov registry were systematically searched. Further references were gathered from cross-references from articles