PULMONARY CIRCULATION

GW26-e0214
Assessment of left ventricular myocardial function in systemic lupus erythematosus patients with varying degrees of pulmonary hypertension by two-dimensional speckle tracking imaging
Xi Li, Jiani Liu, Liping Chen, Xiaoling Zhang, Xin Wei, Hong Tang
Department of Cardiology, West China Hospital of Sichuan University, Chengdu

OBJECTIVES The right ventricle function impaired of systemic lupus erythematosus (SLE) with pulmonary arterial hypertension (PAH) was proven, but the influence on the left ventricle (LV) was uncertain. The aim of this study was to investigate the relation of LV deformational parameters evaluated by two-dimensional speckle tracking imaging (2D-STI) with varying degrees of PAH in SLE patients.

METHODS A total of 72 consecutive patients with SLE were enrolled in the study, and divided into four groups according to the varying degrees of PAH. There were 23 cases in the group without PAH, 19 cases in the mild PAH group (pulmonary artery pressure about 50-500mmHg), the rest 12 subject in severe PAH group (pulmonary artery pressure above 70mmHg). All the subject accepted the routine ultrasonic plane examination to get the images of four-chamber view, three-chamber view and four-chamber. Then the longitudinal strain (LS) and transverse strain (TS) of endocardium, myocardium and epicardium respectively in the two-chamber view, three-chamber-view and four-chamber were obtained by SIEMENS ACUSON SC2000 layer-specific analysis program. Statistical methods: All data were processed by SPSS 18.0, monofactor analysis of variance was used to analysis the left ventricular deformation parameters between groups, and p < 0.05 was considered to have statistical significance. Repetitive observation: the variability of observed value between groups and intra group was described by Bland - Altman analysis.

RESULTS The endocardium and myocardium’s LS in all the view and epicardium’s LS in two-chamber view of the group with severe PAH were distinctly decreased compared with the group without PAH and with mild PAH (<0.05); and the LS also decreased comparing with moderate and mild PAH group, but without statistical significance (p>0.05). Besides, the LS of epicardium in three-chamber view and four-chamber view has no difference in every group. Every layer’s TS was same to each other. In all the views, TS with severe PAH decreased obviously compared to TS without PAH and with mild PAH; however, the drop of moderate PAH group compared the one without PAH was slight (p>0.05). Repeatability test: Bland - Altman analysis showed that the variability of LS and TS’s value between groups and intra group was less than 10%. 

CONCLUSIONS Our study showed that PAH in patients with SLE do influence the left ventricle function. Furthermore, with increased pulmonary artery pressure, left ventricular systolic function declining.

GW26-e0499
Comparison Study of Serum Zinc Concentration and Immune System Functions in Symptomatic Venous Thromboembolism Patients
Siwan Wen,1 Fan Yang,2 Lemin Wang3
1Department of Cardiology, Tongji Hospital of Tongji University, Shanghai; 2Department of Laboratory, Tongji Hospital of Tongji University, Shanghai, China

OBJECTIVES Nowadays, the incidence of venous thromboembolism (VTE) is 1-3% in America, and still increases with the increasing of age. Zinc is one of the essential trace elements, zinc is involved in the synthesis of over 600 kinds of proteins in human body. Intracellular zinc homeostasis plays an important role in the regulation of cell signaling in immune system. Thus, zinc deficiency can lead to dysfunction of both innate and adaptive immune system. In animal models, zinc deficiency causes abnormal cell transformation, most apparent in immune system. The immune system dysfunction has been proved to exist at both cellular and genetic levels in symptomatic VTE patients.

This study aimed to detect serum zinc concentration and indicators of immune system functions in symptomatic VTE patients and to investigate the relationship between them.

METHODS 73 patients diagnosed with VTE (Age: 60.88 ± 14.74 years, Gender: male 47%, female 53%) in Tongji Hospital of Tongji University from 2011 to 2013 were assigned to VTE group. 153 health people (Age: 58.41 ± 8.63 years, Gender: male 47%, female 53%) were recruited into control group. There was no significant difference of age and gender in both groups (P>0.05). Blood was drawn from patients once diagnosis of VTE was confirmed. Serum zinc concentration of both groups were detected via atomic adsorption spectrophotometry (BH5100 Bohui Five Element Analyzer). CD3, CD4, CD8, CD16’CD56’ and CD19 of both groups were detected with flow cytometry (the United States Becton, Druker co., L.)

Data were presented in the format of mean ± standard deviation. Independent-sample test was adopted to compare the serum zinc concentration and CD indicators (CD3, CD4, CD8, CD16’CD56’ and CD19) between VTE group and control group using SPSS Statistics 20.0 (IBM Corporation). The relations of serum zinc concentration to CD indicators (CD3, CD4, CD8, CD16’CD56’ and CD19) in VTE group were detected with correlation analysis in SPSS Statistics 20.0 (IBM Corporation).

RESULTS Serum zinc concentrations of VTE and control group were 10.81 ± 6.49 μmol/l and 13.00 ± 8.16 μmol/l, respectively. Serum zinc concentration of VTE group was significantly lower than that of control group (P<0.05). Student’s t test indicated that CD3, CD8 and CD16’CD56’ in VTE group decreased significantly when compared to the control groups however there were no significant changes of CD4 and CD19 between two groups (P>0.05).

Correlation analysis showed that serum zinc concentration was positively related to CD3 (P<0.05) and negatively to CD4 (P<0.05). However, both of them turned out to be weak correlation (r<0.05). There were no significant correlations of serum zinc concentration to CD8, CD16’CD56’ and CD19 in VTE group (P>0.05).

CONCLUSIONS Symptomatic patients have zinc deficiency and decreases of CD3, CD8 and CD16’CD56’. Zinc deficiency is related to maturation and differentiation of CD3 T lymphocytes in some extent.

GW26-e4723
Serum Concentrations of Sex Hormones in Patients with Idiopathic Pulmonary Arterial Hypertension
Wenhui Wu1, Zhicheng Jin2
1Department of Cardiology, Shanghai Pulmonary Hospital, Tongji University School of Medicine, Shanghai, China; 2Thrombosis and Vascular Medicine Center, State Key Laboratory of Cardiovascular Disease, FuWai Hospital, Peking Union Medical College and Chinese Acad

OBJECTIVES Idiopathic pulmonary arterial hypertension (IPAH) is a fatal disease that predominantly affects young females. Whether there is gender difference is related to changes in sex hormone levels is unknown. To assess serum concentrations of sex hormones in males and females with incident IPAH as compared with healthy controls.

METHODS A matched case-control study, enrolled 372 incident IPAH patients and 256 healthy people from June 2008 to October 2014, was conducted at a national referral center for patients with PAH in China. Serum concentrations of estradiol (E2), testosterone (TT), progesterone (P), follicle-stimulating hormone (FSH), luteinizing hormone (LH), and prolactin (PRL) were measured by an electrochemiluminescence immunoassay. Differences in sex hormones levels between IPAH patients and controls, and correlations between sex hormones and World Health Organization (WHO) functional class, 6-minute walk distance (6MWD), mean pulmonary arterial pressure (mPAP), and cardiac output (CO) were analyzed.

RESULTS In 101 male patients with IPAH, serum E2 and PRL concentrations were increased and serum P concentrations were significantly decreased in comparison with controls (E2: 156.8 (108.6-208.9) vs 105.7 (78.7-132.2)pg/ml, P = 0.007; PRL: 299.4 (189.3-438.0) vs 197.2 (147.7-267.5)IU/ml, P < 0.0001). However, in 225 female patients, serum E2, TT and P concentrations were significantly lower (E2: 169.9 (104.5-330.3) vs 185.7 (108.1-354.1)pg/ml, P = 0.0002), and serum FSH, LH, PRL concentrations were higher than in controls (PRL: 325.5 (224.4-515.3) vs 242.0 (197.1-366.9) IU/ml, P = 0.002). In 46 pediatric IPAH patients, sex hormone levels were equivalent to those in controls. There were various correlations between log-transformed values of sex hormone serum concentrations and WHO functional class, 6MWD, mPAP and CO.
CONCLUSIONS Changes in serum concentrations of sex hormones are extensive in adult patients with IPAH. The influence of these changes on the development of PAH and on the outcome of this condition deserves further study.

GW26-e2948 The Application of Intravascular Ultrasound to Evaluate Pulmonary Vascular Properties and Predict Mortality in Pulmonary Arterial Hypertension Zongye Cai,1 Jun Pu,1 Ling-yue Sun,1 Cheng-de Yang,1 Ben He1 1Department of Cardiology, Renji Hospital, Shanghai Jiaotong University School of Medicine; 2Department of Rheumatology, Renji Hospital, Shanghai Jiaotong University School of Medicine

OBJECTIVES We aimed to explore the application of intravascular ultrasound (IVUS) to evaluate pulmonary vascular properties (PVPs) and predict mortality in pulmonary arterial hypertension (PAH).

METHODS Patients (n=51) with a systolic pulmonary arterial pressure (SPAP) ≥40mmHg based on echocardiography were prospectively enrolled. After underwent right heart catheterization (RHC) and IVUS, they were divided into 3 groups: PAH associated with connective tissue diseases (PAH-CTD) group (group 1, n=25), PAH due to other causes group (group 2, n=15), and CTDs patients without PH (group 3, n=11). PAH group (groups 1 and 2) was divided into distal and proximal remodeling subtype based on IVUS results. All patients were followed-up to compare the differences among clinical variables, PVPs and survival rates.

RESULTS A total of 408 segments of pulmonary vessels were studied. PAH group demonstrated a greater mean wall thickness (MWT) (0.30±0.02 vs. 0.33±0.02 mm, P<0.01) and a higher percentage of MWT (WTP) (13.62±5.59, 14.59±7.77 vs. 9.57±5.97%, P<0.01) than group 3. Additionally, the pulmonary vascular mechanical properties (PVMPs) in PAH group were found to be worse than those in group 3, with reduced compliance (8.85±0.34 vs. 2.39±0.27, P<0.01) and stiffness index β (4.19±0.41, 5.18±0.34 vs. 2.39±0.27, P<0.01). Furthermore, an inverse exponential association was found between PVMPs and hemodynamic abnormalities, with R² ranging from 0.544 to 0.777 (P<0.001). There was no difference between groups 1 and 2 in survival curves. However, the distal remodeling subtype had a higher mortality (22.73%) than the proximal remodeling subtype with a hazard ratio of 10.14 (95% confidence interval: 2.196-50.90, P<0.001).

CONCLUSIONS IVUS may be useful in assessment of PH by evaluating PVPs and predicting mortality. PAH group demonstrated worse PVPs than CTDs patients without PH. PAH-CTD patients had better PVMPs than PAH due to other causes. There was no difference between PAH groups in survival curves. However, distal remodeling subtype had a higher mortality than proximal remodeling subtype.

GW26-e4462 Prognostic value of cardiac troponin T and plasma lactate levels among patients with acute pulmonary embolism Yiqiang Yuan, Shuhong Wang, Xinxin Huang Department of Cardiology, Zhengzhou 7th People’s Hospital

OBJECTIVES To investigate the clinical value of detecting cardiac troponin T (cTnT) and plasma lactate (lac) for risk stratification and prognosis evaluation in patients with acute pulmonary embolism (APE).

METHODS From January 2013 to December 2014, a total of 89 patients were diagnosed with APE. All patients with a diagnosis of APE established by lung scan or spiral computed tomography (CT) and confirmed by pulmonary angiography if necessary. Plasma troponin T and lactate levels were tested at presentation. We considered lactate values greater than or equal to 2 mmol/L and troponin T values greater than or equal to 0.10 ng/ml to be abnormal. 89 patients with confirmed APE were divided into three groups according to the levels of troponin T and plasma lactate: Group 1 (n=44): cTnT > 0.1 ng/ml and lac < 2.0 mmol/L; Group 2 (n=35): cTnT > 0.1 ng/ml or lac ≥ 2.0 mmol/L; Group 3 (n=38): cTnT ≥ 0.1 ng/ml and lac ≥ 2.0 mmol/L. Analysis of troponin T and plasma lactate elevated risk stratification in patients with APE’s relationship with clinical prognosis.

RESULTS Of the 89 patients included in the study, the mean age was 67 years (SD 10.2 years) and 45 (50.6%) were women. Clinical harmful events were death caused by pulmonary embolism and clinical deterioration defined as progression to thrombotic therapy, vasoactive drugs, mechanical ventilation, shock, or cardiopulmonary resuscitation. Patients with clinical harmful events in group 1, group 2 and group 3 were 0 (0%) case, 7 (20.0%) cases, 21 (53.3%) cases respectively and a significant difference was observed (P <0.01). In the group of proceeding clinical harmful events there were significant differences in troponin T and plasma lactate levels (p <0.01). 5 patients (13%) died in group 3 and 0 (0%) case died in group 1 and group 2. All patients underwent thrombolysis treatment in group 3, 10 (28.6%) patients underwent thrombolysis treatment in group 2, and all patients underwent routine anticoagulation.

CONCLUSIONS Combinational detection of troponin T and plasma lactate has important value for early risk stratification and prognosis evaluation in patients with APE. Patients with pulmonary embolism elevated troponin T and plasma lactate level are at high risk of death and adverse outcome.

GW26-e4721 Circulating Progesterone and Hemodynamic Parameters in Men with Idiopathic Pulmonary Arterial Hypertension Ping Yuan,1 Zicheng Jing1,2 1Department of Cardio-Pulmonary Circulation, Shanghai Pulmonary Hospital, Tongji University School of Medicine, Shanghai, China; 2Thrombosis and Vascular Medicine Center, State Key Laboratory of Cardiovascular Disease, FuWai Hospital, Peking Union Medical College and Chinese Acad

OBJECTIVES Pulmonary arterial hypertension (PAH) is a female predominant disease. However, women have preserved right ventricle function and better survival compared with men suffered from PAH. This “sex paradox” indicates sex hormones may contribute significantly to the pathogenesis of PAH. We sought to assess the relationship between serum concentration of sex hormone and hemodynamic parameters in men with idiopathic PAH (IPAH).

METHODS In the observational study, we recruited 98 male IPAH patients (mean ± SD age, 41±18 years), at Cardio-Pulmonary Circulation center (Shanghai Pulmonary Hospital), from June 2008 to October 2014. The study included 85 age-matched healthy male control subjects. Serum concentrations of estradiol (E2), testosterone (TT) and progesterone (P) were measured using immunoassays, and the clinical, functional, and hemodynamic compromises were collected at enrollment.

RESULTS Compared with the healthy controls, serum E2 concentrations were increased, and serum TT, P concentrations were decreased in IPAH patients [E2: 153 (99-215) vs 121 (97-140) pmol/L, P = 0.022; TT: 8.8 (4.6-21.0) vs 15.8 (12.0-19.5) pmol/L, P = 0.007; P: 0.32 (0.22-0.43) vs 0.48 (0.33-0.63) ng/ml, P < 0.001]. There were correlations between P and HR, WHO functional class (FC), 6MWD, serum brain natriuretic peptide, pericardial effusion, pulmonary vascular resistance and cardiac output (all P<0.05). There were no correlations between E2 or TT and the above parameters. At linear regression analysis, P was the predictor most associated to WHO FC, 6MWD, PVR elevation and CO reduction. Furthermore, P was only the independent predictor most associated with PVR elevation after adjustment for age, BSA and WHO FC by multivariate analysis (R²=0.346, 95% IC: -0.153~0.986, P=0.027).

CONCLUSIONS This work demonstrates serum P concentrations were decreased in male IPAH patients. It’s an independent predictor for PVR elevation and could estimate the severity of men with IPAH.