

**OBJECTIVES** Post-capillary Pulmonary hypertension (PH) is a significant contributor to right ventricle (RV) dysfunction and morbidity. The two hemodynamic profiles in left heart disease with PH, passive PH with increased pulmonary venous pressure and reactive PH with increased pulmonary vascular resistance (PVR>3 Wood units, WU), are difficult to distinguish non-invasively. The clinical significance of PVR on right ventricle function remains to be elucidated in patients with rheumatic mitral valve stenosis (RMS).

**METHODS** Between 2014-2016 thirty-nine patients referred to our hospital for the management of pure severe RMS (mitral valve area $\leq$ 1.5 cm<sup>2</sup>, stage D) were included in this study. Two groups were formed based on PVR (calculated based on the ratio of TRV/TVI<sub>RVOT</sub>), 18 patient have PVR $\leq$ 3 WU (group II), and 21 patients have PVR>3 WU (group III). Twenty age-matched healthy subjects with normal echocardiograms served as controls (group I). RV function was assessed using 3D echocardiography according to the recommendations of the American Society of Echocardiography. 3D longitudinal global strain of the RV freewall (RV GLS-freewall) and interventricular septum (RV GLS-septum) were measured using commercially available hardware and software (Philip IE33, Tomtec 4D-RV-analysis software).

**RESULTS** The results of RV function indices for three groups are shown in Table 1. All indices of RV function were significantly lower in patients with reactive PH (Group III) including RV EF, FAC (fractional area change), TAPSE (Tricuspid annular plane systolic excursion, mm) and increase in Tei index (myocardial performance index) compared to group I and II. Patient with passive PH (Group II) have moderate reduced EF and elevation in Tei index as compared to normal controls (Group I). There are no significant difference in FAC and TAPSE between group I and II. RV GLS-freewall and GLS-septum were significant lower in group II compared to group I (p<0.01). Group III patients had further decrease in RV GLSfreewall and GLS-septum compared to group I or II (p1<0.01, p2<0.05, respectively). Multiple linear regression analysis revealed a significantly correlations between GLS (freewall) systolic strain and PVR (r=0.825, p <0.001), as well as between GLS(septum) systolic strain and PVR (r=0.756, p<0.001).

**CONCLUSIONS** Incremental impairments of RV dysfunction were observed in severe rheumatic MS patients from passive to reactive PH. Our study identified a significant correction between global RV longitudinal systolic strain and PVR, suggesting that RVGLS may serve as good index for assessing PH subtypes and RV dysfunction.

#### GW28-e0616

##### Expression of connective tissue growth factor in papillary muscles of heart of patients with rheumatic heart disease

Yina Wang,<sup>1</sup> Jieruo Gu,<sup>2</sup> Buyun Yu,<sup>2</sup> Qiongli Yin,<sup>1</sup> Shangyan Liang<sup>1</sup>  
<sup>1</sup>Special Medical Treatment Center, The Third Affiliated Hospital of Sun Yat-sen University; <sup>2</sup>Department of Rheumatology, The Third Affiliated Hospital of Sun Yat-sen University



**OBJECTIVES** To investigate the expression and the effect of connective tissue growth factor (CTGF) on rheumatic myocardial fibrosis of rheumatic heart disease (RHD).

**METHODS** The papillary muscles samples were obtained from patients with RHD during mitral valve replacement. The expression of CTGF mRNA and CTGF protein were detected with semiquantitative RT-PCR technique and immunohistochemistry technology in the papillary muscles cell from 38 RHD patients and 20 normal papillary muscles samples. The area of myocardial fibrosis was measured by imaging analysis system. Analysis the relationship between the expression of CTGF and the area of myocardial fibrosis.

**RESULTS** Compared with normal controls, the mean levels CTGF mRNA expression in the papillary muscles samples of the patients were significantly increased, RT-PCR amplification production Rein-hoit Zahl (RZ) (0.8229 $\pm$ 0.2697), normal controls (0.0813 $\pm$ 0.0363), (P<0.01). In immunohistochemistry study CTGF protein was strongly expressed in the papillary muscles samples were obtained from patients, whereas it was low expressed in normal controls(43.107 $\pm$ 5.207, 2.661 $\pm$ 0.946, P<0.01). The expression of CTGFmRNA and CTGF protein in papillary muscles of RHD were all correlated positively with the area of myocardial fibrosis (r =0.889, 0.865, P<0.01). The expression of CTGFmRNA in papillary muscles of RHD was correlated positively with the expression of CTGF protein (r =0.823, P<0.01). The expression of CTGFmRNA, CTGF protein in papillary muscles of RHD didn't show the significantly

correlation with the case history, sex and age, but correlated with remarkably with cardiac functional gradings.

**CONCLUSIONS** CTGF expression in the papillary muscles of the RHD patients is significantly increased, which suggests CTGF may play an important role in myocardial fibrosis of RHD.

#### GW28-e0645

##### Surgical treatments for giant left atrium in patients with valvular diseases

Siyi He,<sup>1</sup> Hui Ouyang,<sup>1</sup> Jinbao Zhang<sup>1</sup>  
<sup>1</sup>Department of cardiovascular surgery, Chengdu Military General Hospital



**OBJECTIVES** Once associated with giant left atrium (GLA), poor prognosis will easily occur in patients with valvular diseases. GLA could cause postoperative respiratory and circulatory dysfunction by compression of left ventricle and pulmonary, leading to increased mortality. Various surgical procedures have been employed to GLA, but the efficacy remains unclear. The present study concludes several left atrial reduction operations in single cardiovascular center, intending to give a comprehensive description of surgical treatments for GLA.

**METHODS** All consecutive patients with left atrial diameter greater than 60mm were enrolled in the present research. We conducted a retrospective study from 2009.02 to 2014.12 and a prospective RCT study in comparison of modified left atrial circuit plication procedure (circuit-LAP group) with other left atrial reduction operations (control group) from 2012.06 to 2014.01. Modified left atrial circuit plication was proceeded as follows: from initiation of left atrial roof, left atrial appendage is firstly closed, the suture line is subsequently alongside mitral valve ring and central section of pulmonary veins, and finally ends in the first stitching. All patients were followed up for 12 months.

**RESULTS** 166 left atrial appendage closing, 205 partial left atrial plication, 2 cut-and-sew procedure, 311 modified left atrial circuit plication were used. Once patients received surgical treatments, CPB time and aortic clamping time was significantly increased, but there was no obvious difference in incidence of postoperative complications and mortality. In the perspective study, 75 patients were enrolled in control group while 69 patients were enrolled in circuit-LAP group. These two groups had almost the same CPB time, aortic clamping time and ratio of auto-rebeating. The volume of left atrium was reduced more in circuit-LAP group respectively in the follow-up time of 0, 3, 6, 12 months. Compared with control group, circuit-LAP could significantly increase LVEDD, LVEF as well as E/A value measured by ultrasound, implying that this procedure was beneficial for improvement of cardiac function. As for clinical outcomes, reduced incidence of Low Cardiac Output Syndrome, IABP implantation, and decreased mechanical ventilation time, ICU stay time, hospitalization time could be observed in circuit-LAP group. However, there was no significant difference in ratio of acute kidney injury, ventilator-associated pneumonia, infectious endocarditis, ventricular arrhythmias as well as mortality. In addition, the ratio of sinus rhythm recovery was significantly higher in circuit-LAP group compared with control group in the follow-up time of 3, 6, 12 month.

**CONCLUSIONS** Surgical left atrial reduction operations are safe and effective for treatment of giant left atrium, of which modified left atrial circuit plication is associated with better prognosis.

#### GW28-e0651

##### Association between homocysteine levels and calcific aortic valve disease: a meta-analysis

Qingchun Zeng,<sup>1</sup> Guandi Wu,<sup>1</sup> Jiayi Xian,<sup>1</sup> Jun Li,<sup>1</sup> Die Zhu,<sup>1</sup> Ruxia Liang,<sup>1</sup> Xi Yang,<sup>1</sup> Jiaying Li,<sup>1</sup> Ying Huang,<sup>1</sup> Yan Tu,<sup>1</sup> Dingli Xu<sup>1</sup>  
<sup>1</sup>Department of Cardiology, State Key Laboratory of Organ Failure Research, Nanfang Hospital, Southern Medical University, Guangzhou, China



**OBJECTIVES** Previous studies have reported inconsistent results regarding the association between homocysteine (Hcy) levels and calcific aortic valve disease (CAVD). This study aims to investigate the association between Hcy levels in patients with CAVD by conducting a meta-analysis.

**METHODS** We conducted a systematic search in the database of PubMed, Embase, Web of Science, the Cochrane Central Register of Controlled Trials and Chinese Biomedical Literature Database (CBM) up to March 2017. Eligible studies evaluating plasma Hcy levels in

CAVD patients and controls were identified by two independent investigators. Pooled results were reported as weighted mean difference (WMD) and the corresponding 95% confidence intervals (95% CI).

**RESULTS** Ten studies involving 6349 participants were included. Pooled analysis demonstrated that Hcy levels were significantly elevated in patients with CAVD compared with controls (pooled WMD: 2.98, 95%CI: 1.59 to 4.38). Significantly higher Hcy levels were found both in mild-to-moderate CAVD patients (WMD: 0.62, 95% CI: 0.11 to 1.13) and severe CAVD patients (WMD: 3.15, 95% CI: 2.44 to 3.86) than in controls. In addition, Hcy levels were significantly higher in severe CAVD patients than in mild-to-moderate CAVD patients (WMD: 3.23, 95% CI: 1.14 to 5.32).

**CONCLUSIONS** The present meta-analysis revealed that Hcy levels significantly increased in CAVD patients with the progression of the disease.

#### GW28-e1096

##### Comparison of two anticoagulation strategies for pregnant women with mechanical valves



Zhang Lu,<sup>1,2</sup> Xiaodong Zhuang,<sup>3</sup> Luo Feifei<sup>1,2</sup>

<sup>1</sup>First Affiliated Hospital, Shenzhen University; <sup>2</sup>The Second People's Hospital of Shenzhen; <sup>3</sup>First Affiliated Hospital, Sun Yat-sen University

**OBJECTIVES** To evaluate safety endpoints in pregnant women with mechanical heart valves treated with traditional treatment (vitamin-K antagonists throughout pregnancy) and sequential treatment (first trimester heparin followed by vitamin-K antagonists).

**METHODS** We searched in Medline, Embase, Cochrane databases, and proceedings of major international meetings for clinical trials that comparing traditional treatment and sequential treatment. We conducted the search until January 2017. Two independent reviewers reviewed the titles, abstracts and collected the data from studies that met the inclusion criteria. Conflicts between reviewers were resolved by consensus. We extracted study duration, patient characteristics and clinical outcomes. Internal validity was assessed. The primary safety outcomes were maternal mortality, thromboembolic complications, live births and neonatal adverse events. Odds ratios(OR) and 95% confidence interval(CI) were used as the summary statistic. Random-effects model was used for this meta-analysis.

**RESULTS** We finally identified 22 trials published in English. It was indicated that traditional treatment had a better performance than sequential treatment in maternal mortality (OR:0.45; 95% CI: 0.12-1.01, p=0.06). Meanwhile, it was showed that there were less thromboembolic complications with traditional treatment(OR: 0.52; 95% CI: 0.32-0.96; p=0.02). We noticed a trend towards favoring sequential treatment for live births (OR:0.82; 95% CI:0.56-1.17;p=0.25). However, we found no statistically significant difference in neonatal adverse events.(OR: 0.93; 95% CI:0.62-2.14; p=0.52).

**CONCLUSIONS** In broad terms, it is indicated that traditional treatment is associated with significantly lower rates of maternal mortality and also with less live births. Traditional treatment seemed to bring less thromboembolic complications probably due to the risk from crossover therapy in sequential treatment. Last but not the least, there is no significant difference in neonatal adverse events between traditional treatment and sequential treatment. Considering the swing of anticoagulation strategy, further studies are still needed to clarify the ideal treatment for pregnant women with mechanical valves.

#### GW28-e1195

##### The prognostic analysis of elderly high-risk severe aortic stenosis treated by different therapy procedure



Yunqing Ye

National Center for Cardiovascular Diseases Cardiovascular Institute & Fuwai Hospital

**OBJECTIVES** To provide China's early experience of TAVI technology, verify the validity of the TAVI treatment.

**METHODS** We retrospectively analyzed elderly high-risk patients with SAS hospitalized between September 2012 and June 2015. According to the treatment method, patients were divided into TAVI group, SAVR group and the drug therapy group. Patients were followed-up, and the primary end point was death from any cause at 1 year, and secondary end point included cardiac function class(NYHA), vascular complication, valvular function, non-fatal

myocardial infarction, new atrial fibrillation, stroke, bleeding, pacemaker implantation, acute renal failure, and readmission. The survival curves were performed with the use of Kaplan-Meier estimates and were compared between groups with the use of the log-rank test.

**RESULTS** There were 242 patients conform to the enrolled criteria, 81 patients undergo TAVI(including 57 cases of transfemoral approach, 12 cases of Transaortic approach, 12 cases of transapical approach), 59 patients undergo SAVR, and 102 patients treated by drug. The rates of combined diabetes were 27.2% in the TAVI group and 11.9% in the SAVR group(P=0.027), and combined chronic obstructive pulmonary disease were 18.5% and 6.8% respectively (P=0.045). The rates of renal failure were higher in the SAVR group than the TAVI group, 13.6% vs. 4.9% respectively (P=0.072). More patients combined with complex valve dysfunction in the SAVR group. The average risk score of the Society of Thoracic Surgeons(STS) was 7.28 in the TAVI group, and 5.67 in the SAVR group(P=0.036), indicating higher operating risk in the TAVI group than in the SAVR group. The rates of perioperative vascular complications were 6.3% in the TAVI group and 0% in the SAVR group (P=0.057). The new pacemaker implantation and mild para-valvular regurgitation were more frequent with TAVI group, 11.3% vs. 0% (P=0.025) and 29.6% vs. 1.7% (P<0.001)respectively. Adverse events that were more frequent after SAVR at 1 year included new onset atrial fibrillation (2.3% vs. 0% P=0.674) and rehospitalization (21.3% vs. 3.0% P=0.005). At 1 year, the rates of stroke were 3.0% in the TAVI group and 6.8% in the SAVR group(P=0.628). The rates of death from any cause were 3.8% in the TAVI group and 5.2% in the SAVR group at 1 month (P=1.000), and 5.8% and 9.8% respectively at 1 year(P=0.636). The mortality at 1 year was 54.9% in the drug therapy group. The New York Heart Association (NYHA) functional status were improved significantly in both groups at 1 year.

**CONCLUSIONS** In elderly high-risk patients with SAS, the prognosis were very poor when treated only by drug; transcatheter and surgical procedures for aortic-valve replacement were associated with similar short-term and long-term prognosis, although there were important differences in peri-procedural risks.

## CARDIOMYOPATHY

#### GW28-e0050

##### Assessment 2D and 3D global longitudinal Strain of abnormal LV myocardial deformation properties Using 3D Speckle-Tracking Echocardiography in young HCM



Yang Qian,<sup>1</sup> Tang Peng,<sup>1</sup> Shuping Ge,<sup>1</sup> Hong Wang,<sup>1</sup> Xiaofeng Yang,<sup>1</sup> Liwen Liu,<sup>1</sup> Xiaodong Zhou<sup>1</sup>

<sup>1</sup>The first affiliated hospital of military medical university

**OBJECTIVES** Hypertrophic cardiomyopathy (HCM) is a disease predisposes to unexplained left ventricular (LV) hypertrophy and dysfunction and non-dilated ventricular chambers associated unusual myocardial mechanics. The most serious complications of HCM is sudden death for young subclinical patients, thus, observing and analyzing LV strain has particular values of diagnostic and prognostic for young HCM patients. The objective of this study was to determine which strain component assessed by 2-dimensional speckle-tracking echocardiography (2DSTE) and 3-dimensional speckle-tracking echocardiography (3DSTE) was the most powerful predictor for young HCM.

**METHODS** We enrolled 96 young subjects (45 HCM (32 males; 25 ± 6 yrs) and 41 controls (27 males; 26 ± 4 yrs)) underwent TTE performed strain analysis using both 2DSTE and 3DSTE. Two-dimensional and 3-dimensional global longitudinal, circumferential, and radial strain and global 3-dimensional strain of the LV were measured in each patient using QLab and TOMTEC software by two-independent-specialists.

**RESULTS** Data analysis for the new 3D-STE methodology: (-21.94 ± 3.4% vs 27.8 ± 5.1%, P > 0.001 (2D GLS), -19.3 ± 3.4% vs 26.3 ± 4.2%, P < 0.001 (3D GLS), -85.2±43.7% vs 106.3 ± 26.82%, P < 0.001 (3D GRS), -30.7 ± 5.7% vs 34.3 ± 6.4%, P > 0.001, (3D GCS), respectively. 3D GLS but not GRS, GCS significantly correlated with LVMI, E/Ea and LVOT-PG (P<0.05) in young HCM subjects.

**CONCLUSIONS** LV global 3D systolic strain analysis using the new 3D-STE methodology is feasible and reproducible. 3D GLS is more sensitive index than 2DGLS for young HCM.