associated genes have been identified, including the gene encoding cardiac troponin T type-2 (TNNT2). We examined polymorphisms of the TNNT2 gene in a Kazak family from Xinjiang, China, and in idiopathic DCM (IDCM) patients of both Kazak and Han ethnicity.

**METHODS** Peripheral blood samples were collected from 9 members of the FDCM, from 180 patients with IDCM (90 Kazak and 90 Han), and 180 healthy controls (90 Kazak and 90 Han). PCR was used to amplify 45 exons and nearby introns of the TNNT2 gene. The amplified products were sequenced and compared to the standard sequence in Pubmed by BLAST and CHROMAS software, to identify mutation sites.

**RESULTS** IDCM from Kazak and Han were compiled for Hardy-Weinberg equilibrium. There was a significant difference in the genotype distribution ($\chi^2 = 6.67, P = 0.01$) and allele frequency ($\chi^2 = 5.17, P = 0.001$) between the FDCM and IDCM and Han controls of SNP rs3729547. Meanwhile, it also has a difference in the genotype distribution ($\chi^2 = 7.62, P = 0.022$) and allele frequency ($\chi^2 = 6.73, P = 0.009$) between Han with IDCM and Han controls, but the rate of IDCM was descend. A novel variant (c.67G -> T) was identified in one FDCM patient at exon 13, this mutation caused an amino acid substitution.

**CONCLUSIONS** The TNNT2 SNP rs3729547 is not only a possible independent risk factor for Han ethnicity, but also for Kazak ethnicity.

**GW26-e4659**

Treatment for hypertrophic obstructive cardiomyopathy by coil embolization of a targeted septal artery

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**OBJECTIVES** To investigate the immediate and short-term therapeutic feasibility and efficacy of coil embolization of a targeted septal artery in patients with hypertrophic obstructive cardiomyopathy (HOCM).

**METHODS** Four patients with hypertrophic obstructive cardiomyopathy refractory to medication were chosen, and treated with coil embolization of a targeted septal artery. Preoperative, intraoperative and postoperative left ventricular outflow tract pressure gradient (LVOTPG), septal thickness and systolic anterior motion of mitral (SAM) phenomenon were compared. Postoperative complications and improvement of clinical symptoms were observed.

**RESULTS** Embolization of the targeted septal branch was successfully performed in 4 patients. Compared with preoperative LVOTPG of patients after balloon pressure and complete occlusion were significantly lower(92.50±26.30 vs. 38.00±6.93 and 28.25±6.24 mmHg; $P<0.05$, respectively). The average septal thickness of patients at one month after operation was not statistically significant difference compared with the preoperative value(18.40±2.36 vs. 18.68±2.42 mm; $P>0.05$, respectively). Follow-up of the 4 cases at 1 month after operation revealed remarkable attenuation of SAM phenomenon. We did not detect ventricular tachycardia and atrioventricular block. Postoperative NYHA classification were significantly lower than baseline (3.00±0.82 vs. 1.50±0.58; $P<0.05$, respectively).

**CONCLUSIONS** The study showed treatment for hypertrophic obstructive cardiomyopathy by coil embolization of a targeted septal artery is feasible. In the treatment of HOCM, coil embolization of a targeted septal artery can significantly reduce LVOTPG and improve clinical symptoms.

**GW26-e4624**

The effects of smoking and drinking on all-cause mortality in patients with dilated cardiomyopathy: a single-center cohort study

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**OBJECTIVES** Recent studies have shown that smoking and drinking are associated with poorer outcomes in patients with cardiomyopathy. The purpose of this study was to determine all-cause mortality in dilated cardiomyopathy (DCM) associated with smoking and drinking.

**METHODS** An observational cohort study was undertaken in DCM patients from November 2003 to September 2011. A total of 1188 patients were enrolled, with a mean follow-up of 3.5±2.3 years. Standard demographics were obtained, and transthoracic echocardiography and routine blood testing were performed shortly after admission. Outcome assessment was based on the all-cause death after admission.

**RESULTS** The patients were divided into three groups: non-smokers, moderate smokers (n = 159) and heavy smokers (n = 366). The all-cause mortality rates showed no differences between the three groups (23.8%, 20.8% and 24%, respectively; log-rank $\chi^2 = 2.18$, $P = 0.527$). There was also no significant difference in mortality between non-smokers (n = 147), mild smokers (n = 142) and moderate smokers (n = 229) (23.2%, 23.2% and 22.3%, respectively; log-rank $\chi^2 = 2.342$, $P = 0.310$). In the Cox analysis, neither the smoking (HR 0.971, $P = 0.663$) nor the drinking status (HR 0.891, $P = 0.140$) was a significant independent predictor of all-cause mortality in patients with DCM.

**CONCLUSIONS** In conclusion, there were no significant differences in mortality between the smoking-and drinking-related patient groups, indicating no effect of smoking and drinking on all-cause mortality in patients with DCM in the present large-scale study.

**GW26-e0787**

Correlation between Tei index and B-natriuretic peptide in dilated cardiomyopathy patients

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**OBJECTIVES** The growing number of heart failure patients is becoming an important issue in cardiology. B-natriuretic peptide (BNP) is a recognized marker of heart failure, including in patients with dilated cardiomyopathy. The Tei index is an indicator of left ventricular function. The aim of the study was to evaluate the relationship between Tei index and the concentration of plasma BNP in dilated cardiomyopathy patients.

**METHODS** Fifty patients with dilated cardiomyopathy were enrolled in the study. Fifty healthy individuals were assigned to the control group. BNP was measured by enzyme linked immunosorbent assay (ELISA). Echocardiography was performed to calculate Tei index.

**RESULTS** Median value of BNP in patients with dilated cardiomyopathy was 1086.1 pg/ml, and 42.8 pg/ml in control group ($P<0.05$). The median value of the Tei index was 0.80 in patients with dilated cardiomyopathy, 0.310. In the Cox analysis, neither the smoking (HR 0.971, $P = 0.663$) nor the drinking status (HR 0.891, $P = 0.140$) was a significant independent predictor of all-cause mortality in patients with DCM.

**CONCLUSIONS** The correlation between Tei index and BNP was significantly increased in dilated cardiomyopathy patients. There was a significant positive correlation between them. Tei index was a better index to estimate ventricular global function than other conventional indices.

**GW26-e4626**

Percutaneous transluminal coil embolization of septal artery for ablation of septal hypertrophy in hypertrophic obstructive cardiomyopathy

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**OBJECTIVES** To evaluate the feasibility and the safety after nonsurgical septal myocardial reduction by coil embolization in hypertrophic obstructive cardiomyopathy (HOCM).

**METHODS** Thirteen patients (pts) (male: 5 pts; mean age: 48 (10 years) with HOCM and drug-refractory symptoms underwent ablation of septal hypertrophy by coil embolization with detachable coils. The Terumo® coils (Cook Inc, Bloomington, IN, USA) with diameter in diameter 2 or 3cm in length, were delivered through a 3F RenegadeTM Hi-Flo microcatheter (Boston Scientific Scimed, Maple Grove, MN, USA) positioned inside the target vessel as distally as possible. One or more straight coils were used for each target vessel until complete flow obstruction was noted. The intraventricular pressure gradient
was measured before, during and after the procedure. Septal branch occlusion was finally documented by coronary angiography.

RESULTS All patients were symptomatic (NYHA class 3 or 4). The target septal vessels were successfully occluded in all patients, without complications. The embolized septal branches: 1 vessel in 8 patients; 2 vessels in 5 patients. The number of coils delivered ranged from 1 to 3 / patient. Moderate pain was recorded during and after the procedure and the CTnI level increased four- to nine-fold. The pressure gradient diminished during the procedure from 82 ± 2.3 mm Hg to 27 ± 15 mm Hg. Trans-thoracic echocardiography showed a significant reduction of the inter-ventricular septum thickness and left ventricular outflow tract gradient (132 ± 3 vs. 15 ± 2 mm, P = 0.0001; 79 ± 2.3 vs 33 ± 14 mmHg, P = 0.0001, respectively) at 6 month-follow-up. Clinical improvement was recorded in all patients compared with baseline (NYHA class 1 or 2), and all patients were neither detected severe ventricular arrhythmia nor permanent atrioventricular blockage following the procedure. Three patients presented transient bundle branch block.

CONCLUSIONS Percutaneous transluminal coil embolization is an efficient and safe approach for transcatheter ablation of septal hypertrophy in HOCM. This technique induced myocardial necrosis without the toxic effects of alcohol septal ablation and surgical myocardial septal reduction.

GW26-e2376
Genetic anticipation in familial hypertrophic cardiomyopathy
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OBJECTIVES From the pedigrees of families with or without mutations in beta-myosin heavy chain gene (MYH7) afflicted in two or more generations with hypertrophic cardiomyopathy (HCM), age and maximal wall thickness (MWT) of left ventricle at diagnoses were evaluated to investigate the patterns of inheritance.

METHODS 56 individuals were analyzed from 25 families. Linear mixed effects models were adopted to prevent misinterpretation due to the cohort effect. Publication data contain 9 sarcomere mutations (181 individuals in 52 families) were also extracted.

RESULTS MYH7 mutations were detected in 9 of the 25 probands, The mechanism of anticipation was in younger generation and 55 in older (p < 0.001). In the parametric model, the estimated change in the expected age at diagnosis for the entire cohort was 25.8 years (p < 0.001). Statistically significant earlier ages at diagnosis were also observed within subgroups of MYH7+- and MYH7- mutations, proband over and below 30 years old families. Although the estimated change in MWT at diagnosis for the entire cohort was only 2.161 mm (p = 0.212), proband below 30 years subgroup got 10.393 mm (p = 0.018) thicker in younger generation in MWT, and showed a significant reversed correlation with age. Analysis of publication data also supports above finding.

CONCLUSIONS Familial HCM prone to be diagnosed at an earlier age in later generations. Those who are younger with relative contract to HCM, especially those who be diagnosed earlier than 30 should continue to be tracked to offer appropriate screening modalities as earlier as possible.

GW26-e1310
Effects of recombinant human brain natriuretic peptide on heart failure in acute severe viral myocarditis patients
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OBJECTIVES To investigate the effect and safety of recombinant human brain natriuretic peptide (rhBNP) on heart failure in acute severe viral myocarditis patients (ASYMC).

METHODS 27 patients from Jan 2010 to Dec 2013 admitted to the Third Affiliated Hospital of Sun Yat-sen University were divided into two group, rhBNP group 14 patients, control group 13 patients, rhBNP group received rhBNP on the treatment of cedilidin, diuresis, vascular dilatation, BN, CTnI, CT-M, CK-MB and echocardiography were observed, therapeutic effect of two group were also observed.

RESULTS rhBNP decreased BN [(203±1±39.8) vs (1185.5±48.3) pg/ml], CTnI [(10.3±5.9) vs (24.8±13.2) µg/L], CK-MB [(32.9±10.7) vs (195.3±48.2) U/L], improved LVEF [(59.2±9.2)% vs (38.1±8.8)%] significantly, P<0.05. Furthermore, the therapeutic effect of rhBNP group were better than control group (92.8% vs 84.5%, P<0.05), and we didn't observe obvious side effects in rhBNP group.

CONCLUSIONS rhBNP is an effective and safe therapeutic measures for heart failure in ASYMC.

GW26-e0458
Clinical features of the fulminant myocarditis
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OBJECTIVES To review the clinical features of fulminant myocarditis, in order to provide assistance to the clinical management.

METHODS The clinic data of 183 patients with viral myocarditis, including 153 cases of acute myocarditis and 30 cases of fulminant myocarditis admitted in our hospital during January 2008 and Dec 2012 were retrospectively analyzed. The age of onset, interval after virus infect, initial symptoms, auxiliary examination, treatment, and turnover were compared in the study.

RESULTS The average onset age of fulminant myocarditis and acute myocarditis were similar(22.3±7.6 vs 26.2±12.6 years, P=0.105). There was a significant difference between the two groups in the rate of patients with a explicit history of virus infection(30.0%/n=60 vs 78.4%/n=120, P<0.0001), chest congestion(28.3%, P<0.0001), the average interval after virus infect(3[1±2.2] vs[7[1±1.5] days, P<0.0001) and the length of hospital stay(12[1±6.0] vs(6.9±4.5) days, P<0.0001). Chest congestion(101/153,66.0%), feebleness(76/153,49.7%), fluster(74/153,48.4%) are the most onset symptoms of acute myocarditis, while chest congestion(24/30,80.0%), shortness of breath(4/30,13.3%), feebleness(13/30,43.3%) in fulminant myocarditis. Advanced A-V block(19/30,63.3%), cardiogenic shock(8/30,26.6%), ventricular arrhythmia(16/30,53.3%), Adams-Stokes syndrome(8/30,26.6%) and acute renal failure(8/30,26.7%) were the most complications of fulminant myocarditis. Temporary pacemaker(11 cases), extracorporeal membrane oxygenator(7 cases) and intra-aortic balloon pump(7 cases) were applied in critical patients. In acute phase, 21 cases were cured, 9 cases was dead of cardiogenic shock and ventricular(27,30.0%). Two dead cases applied with ECMO because of delay. These dead cases were died within one week after be in hospital. Low ventricular ejection fraction(<0.40), cardiogenic shock(0.004), and mechanical ventilation(0.001) were related with death of fulminant myocarditis in acute phase. Three cases with low left ventricular ejection fraction(EF<50%) who reviewed the echocardiography was normal one month before. Besides in acute phase, ST-T wave-imitated myocardic infarction was normal one month later. In follow-up of 21 cases fulminant myocarditis, their heart functions were recovered(NYHA I), and 2 cases relapsed, while 2 cases relapsed in the follow-up of 50 cases of acute myocarditis. The relapsed cases all diagnosed with acute myocarditis, and were cured with nutritional supportive therapy. There is no significant difference between 2 groups(0.57).

CONCLUSIONS The fulminant myocarditis has a rapid onset, most of which has no prodrome of virus infection or a shorter interval than acute myocarditis. Timely and effective mechanical circulatory support is critical for fulminant myocarditis. The prognosis of fulminant myocarditis is favorable, and there is no difference compared with acute myocarditis.

GW26-e2448
Echocardiographic feature of cardiac amyloidosis due to multiple myeloma
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OBJECTIVES To explore the echocardiographic feature and prognosis of cardiac amyloidosis due to multiple myeloma.

METHODS Patients with cardiac involvement of light-chain type amyloidosis due to multiple myeloma confirmed by pathology were enrolled and echocardiographic data were analyzed retrospectively.

RESULTS Seven patients were identified (five man and two woman) between 1998 and 2015, Mean age at diagnosis was 52.19±5.9 (49-59) years. All patients presented cardiac manifestations (heart failure n=6, rhythm disorders n=1) and extra-cardiac manifestations (renal n=6, gastrointestinal n=5). Echocardiography demonstrated: Symmetrically increased LV wall thickness in seven patients, one with normal size of LV cavity and six with small LV cavity. Five patients showed small pericardial effusions. Five patients with granular speckled appearance and two patients with diffuse speckled appearance. E/A = 0.71±0.22, EF = 52.11±16.2%. All pa- tients with cardiac failure at diagnosis (n=6) died with a median survival of 1.5 month duration.

CONCLUSIONS Cardiac involvement is rare but crucial in patients’ prognosis with multiple myeloma. The typical echocardiographic appearances would be enough to diagnose cardiac amyloidosis, if an additional histological specimen from another tissue confirms amyloidosis.