

**Results:** A total of 48 stents from 24 pigs were harvested. There is no acute in-stent thrombosis formation during the trial. After 90 days, percent diameter stenosis (% DS), late loss (LL), and percent area stenosis (%AS) of Ni-Ti sirolimus-eluting stents was (10.9±0.3) %, (0.31±0.02) mm and (23.1±3.7) %. Histomorphometric analysis showed no significant difference in reducing neointimal hyperplasia compared to EXCEL™ stent in porcine coronary models. No inflammatory reaction was observed around the stent strut of Ni-Ti based stent after 90 days. It might take 90 days for Ni-Ti sirolimus-eluting stents to complete its endothelialization.

**Conclusions:** Ni-Ti sirolimus-eluting stents with bioabsorbable polymer showed excellent biocompatibility in porcine model. It is proved that this new DES system can inhibit neointimal hyperplasia and decrease in-stent stenosis with safety and efficacy.

## GW25-e2518

### A study of quality of life in patients with coronary heart disease after drug-eluting stent implantation

Sun Junge, Xiao Jian-Ming

First Affiliated Hospital of Kunming Medical University

**Objectives:** To investigate the quality of life (QOL) after drug-eluting stent (DES) implantation in patients with coronary heart disease (CHD) and its related factors, so that we can provide more targeted treatment and guidance for the future of this kind of patients.

**Methods:** 132 patients with CHD treated were selected as object of the study. The patients were voluntary to accept DES implantation for treatment. A questionnaire survey was conducted before and after drug-eluting stent implantation for 6 months with SF-36 Questionnaire, Seattle Angina Questionnaire (SAQ) and self-designed basic information questionnaire of patients. The aim is to analyze the QOL in different gender, age, place of residence, education level and other risk factors before and after patients with CHD treated with DES and its related factors.

**Results:** (1) Scores for physical component summary (PCS), mental component summary (MCS) and eight categories, Seattle Angina Questionnaire (SAQ) score and five categories were better significantly after the patients with DES implantation for 6 months compared with before (all  $P < 0.01$ ). (2) After DES implantation: The postoperative PF, role-physical (RP), VT, mental health (MH) of patients whose age  $< 60$  years were better than patients whose age  $\geq 60$  years (86.32±9.09vs.78.67±9.55, 69.36±26.77vs.51.67±19.62, 84.56±9.12vs.78.7.62, 81.57±10.35vs.76.40±19.98, all  $P < 0.05$ ); The PF, RP, VT, MH of male patients were better than female patients (86.32±9.09vs.78.67±9.55, 69.36±26.77vs.51.67±19.62, 84.56±9.12vs.78.83±7.62, 81.57±10.35vs.76.40±10.98, all  $P < 0.05$ ). The BP, SF, physical limitation (PL), AS, and AF of patients whose chronic coronary artery disease (CAD) before operation were better than patients whose acute coronary syndrome (ACS) (31.43±15.42vs.26.93±15.66, 60.12±16.11vs.42.68±12.09, 39.26±9.77vs.34.41±9.03, 34.52±14.74vs.24.77±17.35, 22.86±8.45vs.9.55±9.28, all  $P < 0.05$ ), and the difference disappeared after operation. Patients whose LVEF  $> 50\%$  were better in RP, VT, SF, RE, MH and AS than those whose LVEF  $\leq 50\%$  after operation (68.58±22.85vs.48.68±34.83, 82.96±8.12vs.74.47±12.79, 84.96±12.06vs.73.02±13.34, 87.91±17.85vs.73.69±21.02, 80.21±9.81vs.71.58±12.50, 91.15±14.91vs.82.89±18.73, all  $P < 0.05$ ). (3) Age, LVEF, complications, gender and BMI were factors which inflect the QOL after DES implantation for 6 months (PCS: Beta - 0.399, 0.260, -0.256, -0.229, -0.206, all  $P < 0.05$ ). The patients who had more complications, higher age, higher BMI, female and lower LVEF had worse QOL.

**Conclusions:** DES can significantly improve the QOL in patients with CHD; The main factors affected the QOL in patients with CHD were age, gender, BMI, complications, gender and LVEF.

## GW25-e0055

### Comparative study of cardio-ankle vascular index between Chinese and Japanese healthy subjects

Hongyu Wang<sup>1</sup>, Kohji Shirai<sup>2</sup>, Jinbo Liu<sup>1</sup>, Hongwei Zhao<sup>1</sup>, Yuejie Song<sup>1</sup>, Xujing Zhao<sup>1</sup>, Hongyan Shi<sup>1</sup>, Lihong Li<sup>1</sup>

<sup>1</sup>Department of Vascular Medicine; Peking University Shougang Hospital, Beijing 100144, P. R. of China, <sup>2</sup>Department of Internal Medicine, Sakura Hospital, School of medicine, Toho university, 564-1 Shimoshizu, Sakura-shi, Chiba 285-8741, Japan

**Objectives:** Arterial stiffness is an independent predictor for vascular diseases. Cardio-ankle vascular index (CAVI) is a new index of arterial stiffness. However, there was little research about the CAVI value between different countries. The aim of the present study was to compare CAVI between Chinese and Japanese subjects and to assess related factors.

**Methods:** 2519 healthy persons [1245 Chinese (M/F, 524/721) and 1274 Japanese (M/F, 534/740)] from department of physical examination were enrolled into our study. CAVI was recorded using a VaseraVS-1000 vascular screening system.

**Results:** CAVI was increasing with aging in all subjects. CAVI was significantly lower in Chinese compared with Japanese both in male and female. There was difference in lipid metabolism between these two groups. Multivariate analysis showed that age, systolic blood pressure (SBP), fasting plasma glucose (FPG), plasma creatinine (Cr) were significant independent associating factors of CAVI in Chinese persons ( $\beta = -0.548, P < 0.001$ ;  $\beta = 0.129, P = 0.001$ ;  $\beta = 0.105, P = 0.006$ ; and  $\beta = 0.100, P = 0.012$ , respectively), whereas age, SBP, high density lipoprotein cholesterol (HDL-C), Cr, body mass index (BMI), FPG were significant independent associating factors of CAVI in Japanese subjects ( $\beta = 0.669, P < 0.001$ ;  $\beta = 0.198, P < 0.001$ ;  $\beta = -0.079, P < 0.001$ ;  $\beta = 0.090, P < 0.001$ ;  $\beta = -0.124, P < 0.001$ ;  $\beta = 0.055, P = 0.009$ ; respectively).

**Conclusions:** CAVI was increasing with aging in both Chinese and Japanese subjects. CAVI was significantly lower in Chinese than in Japanese subjects. Age, SBP, FPG and creatinine were independently associated with CAVI in both Chinese and Japanese subjects.

## GW25-e0401

### Drug-coated balloon versus drug-eluting stent in the treatment of patients with in-stent restenosis: A meta-analysis of randomized controlled trials

Pan Liang, Han Zhanying, Lu Wenjie, Chen Xiaojie, Qiu Chunguang

Department of Cardiology, The First Affiliated Hospital of Zhengzhou University

**Objectives:** With the development of drug-eluting stent (DES), it has drastically cut the incidence of in-stent restenosis (ISR). However, the management of DES-ISR is particularly challenging. Drug-coated balloon (DCB) is a new choice for ISR, and is an established treatment for ISR after prior bare metal stent and recommended by present European revascularization guidelines. Several randomized controlled trials (RCTs) have been developed, but they are compact and the clinical and angiographic results are not consistent. Thus, we propose to compare the difference of safety and effectiveness between DCB and DES in the treatment of ISR by the present meta-analysis of RCTs.

**Methods:** EMBASE, PubMed, CENTRAL and Google Scholar were comprehensively searched in March 2014 for eligible RCTs where patients with ISR were randomly assigned to either DCB or DES treatment. Endpoints of interest were all cause death, major adverse cardiac events (MACEs), target lesion revascularization (TLR), binary restenosis and late lumen loss (LLL). A fixed-effect model was firstly utilized to calculate the pooled odds risk (OR) and standardized mean difference (SMD) with 95% confidence intervals (CIs).

**Results:** Four studies involving 808 patients were identified that fulfilled the inclusion criteria in this analysis. Mean follow-up duration was 12 months. For all cause death (OR 0.809, 95% CI 0.346 to 1.889,  $P = 0.624, I^2 = 27.6\%$ ), MACEs (OR 1.033, 95% CI 0.712 to 1.499,  $P = 0.863, I^2 = 14.6\%$ ), TLR (OR 1.320, 95% CI 0.585 to 2.978,  $P = 0.504, I^2 = 60.5\%$ ), binary restenosis (OR 1.012, 95% CI 0.693 to 1.476,  $P = 0.951, I^2 = 30.9\%$ ), and LLL (SMD -0.065, 95% CI -0.315 to 0.185,  $P = 0.611, I^2 = 67.1\%$ ). Among the measurements listed above, TLR and LLL were pooled with a random-effects model because of heterogeneity. Based on these results, we can conclude that the outcomes of the comparison between DES and DCB have no significant difference.

**Conclusions:** Being compared to DES, DCB is non-inferior whether on the safety or effectiveness. Furthermore, DCB use will be polymer-free to reduce the risk of late thrombosis, decrease the duration of dual antiplatelet therapy and avoid the "onion-skin" phenomena. Thus, DCB could be considered a promising choice for the treatment of ISR in selected clinical settings.

## GW25-e0566

### Cystatin C combined with creatinine seems to be a reliable early predictor of MACEs in patients undergoing PCI

Zhang Weifeng, Shiqun Sun, Tuo Zhang, Xiaolei Wang, Liuhua Hu, Linghong Shen, Ben He

Renji Hospital, Shanghai Jiaotong University School of Medicine

**Objectives:** Recent studies have demonstrated that serum cystatin C (CyC) strengthens the association between the eGFR and the risk of death and end-stage renal disease. Patients with contrast induced-acute kidney injury have greatly increased risks of cardiovascular events and cardiovascular deaths after percutaneous coronary intervention (PCI), but the prognostic impact of CyC alone or along with sCr on patients undergoing PCI has not been well determined.

**Methods:** We measured CyC together with sCr in 266 consecutive patients undergoing percutaneous coronary intervention (PCI) from June 2013 to February 2014 in our cardiovascular center. CyC and sCr were assessed at baseline and within 24 to 48 hours after contrast media exposure. Major adverse coronary events (including all-cause mortality, myocardial infarction, and cardiac revascularization) were assessed during a mean follow-up of 3.5 months.

**Results:** Within 24 to 48 hours after contrast media exposure, contrast-induced acute kidney injury (defined as a sCr increase 25%) occurred in 14 patients (5.26%). A CyC

increase concentration 10%, 15%, 20% and 25% within 24 to 48 hours after contrast media exposure was detected in 47 patients (17.67%), 35 patients (13.16%), 24 patients (9.02%) and 16 patients (6.02%), respectively. By logistic regression analysis, the independent predictor of major adverse events was cutoffs defined as increase in CrC 10% or sCr 25% (odds ratio 3.89; 95% confidence interval, 1.20 to 12.54;  $P=0.02$ ).

**Conclusions:** In patients undergoing percutaneous coronary intervention, cystatin C in combined with creatinine seems to be a reliable marker for the early diagnosis of contrast-induced acute kidney injury, and an independent predictor of MACEs.

#### GW25-e2330

##### Accelerated endothelialization with a CD105 antibody-coated stent

Cui Song<sup>1</sup>, Jing-Hua Liu<sup>1</sup>, Xian-Tao Song<sup>1</sup>, Chao Ding<sup>2</sup>, Li-Jun Meng<sup>3</sup>, Shuzheng-Lv<sup>1</sup>

<sup>1</sup>The Key Laboratory of Remodeling-related Cardiovascular Diseases, Department of Cardiology, <sup>2</sup>Department of Cardiology, Huimin County People's Hospital, Binzhou 251700, China, <sup>3</sup>Department of Cardiology, Binzhou Central Hospital, Binzhou 251700, China

**Objectives:** Endoglin/CD105 is an accessory protein of the transforming growth factor- $\beta$  receptor system that plays a critical role in proliferation of endothelial cells and neovasculation. Here, we aimed to assess the effect of novel stents coated with antibodies to endoglin (ENDs) on coronary neointima formation.

**Methods:** Thirty ENDs, thirty CD34 stents (CD34s), thirty sirolimus-eluting stents (SEs), and thirty bare metal stents (BMSs) were randomly assigned and placed in the coronary arteries in 40 juvenile pigs. Histomorphometric analysis and scanning electron microscopy were performed after stent implantation.

**Results:** Our results showed that after 7 days, there was no difference in the neointimal area and percent area stenosis in ENDs compared with CD34s or BMSs. After 14 days, the neointima area and percent area stenosis in ENDs and CD34s and SEs were markedly decreased than those in BMSs ( $P<0.05$ ). Moreover, the percentage of reendothelialization was significantly higher in ENDs and CD34s than that in SEs or BMSs ( $P<0.05$ ) at 7 and 14 days. There was no difference in the neointima area and percent area stenosis and percentage of reendothelialization in ENDs compared with CD34s. The artery injury and the inflammation scores were similar in all groups at 7 and 14 days.

**Conclusions:** In conclusion, similar to CD34s, our results demonstrated for the first time to our knowledge that endoglin antibody-coated stents can markedly reduce restenosis by enhancing reendothelialization in the porcine model and potentially offer a new approach to prevent restenosis.

#### GW25-e2475

##### Prevention of contrast-induced Nephropathy with l-carnitine in Coronary Heart Disease Patients with Diabetes Mellitus undergoing percutaneous coronary intervention

Li Wenhua, He Haiyan, Wang Lin, Chen Jing, Yu Yaren, Qian Wenhao, Liu Jiali, Li Dongye

Affiliated Hospital of Xuzhou Medical College

**Objectives:** To evaluate the safety and efficacy of l-carnitine in prevention of contrast-induced nephropathy (CIN) in coronary heart disease (CHD) patients with diabetes mellitus (DM) undergoing percutaneous coronary intervention and assess the value of determination of urine kidney injury molecule-1 (KIM-1) protein concentration in the early diagnosis of CIN.

**Methods:** A single-center prospective randomized controlled trial was performed. 145 CHD patients with DM were divided randomly into groups control ( $n=73$ , receiving only 0.9% sodium chloride solution for routine hydration) and intervention ( $n=72$ , based on routine hydration receiving l-carnitine 3.0 g to join saline 250 ml of intravenous infusion in 0.9% sodium chloride 3d before operation, and on day 1,2, respectively, after operation). All entrants in surgery on regular check. The renal function of all patients were accessed before and 1-2 days after operation. And 15ml urine was collected before and 2h,6h,12h,24h,48h after operation and centrifuged at 3,000r/min in 4°C for 20 minutes then 1 ml supernatant was collected which stored in -80°C Ultra-low temperature freezer until use. Urine KIM-1 level was measured by Enzyme-linked immunosorbent assay (ELISA).

**Results:** The two groups were well matched for baseline characteristics, the average amount of contrast medium during operation. There were 19 cases of CIN of the 145 patients (13.1%). The incidence of CIN was 19.2% (14/73) in sodium chloride group while 6.9% (5/72) in l-carnitine group. The incidence of contrast-induced nephropathy was lower in l-carnitine group than in control, but the difference was significant (6.9% vs 19.2%,  $P<0.05$ ). There was a significant difference ( $P<0.05$ ) between the urine KIM-1 level of 2, 6, 12, 24, 48 h (4015.83±855.96, 5095.32±1235.09, 5982.04±1506.02, 6984.20±1441.87, 6078.81±1519.56) pg/ml after operation and the urine KIM-1 level (3515.98±954.58) pg/ml before operation. There was not a significant difference between the Scr level at 24h after operation and before the operation. CIN can be

diagnosed by urine KIM-1 at least 24h ahead Scr. The area under the ROC curve of urine KIM-1 24h after operation is 0.856, confidence interval of AUC 95% is (0.782,0.929). If the critical point of the diagnosis of CIN by the urine KIM-1 is 6327.755pg/ml, the sensitivity is 73.7% and the specificity is 85.7%. Bivariate shows that the level of KIM-1 before and 24.48h after operation positively correlated with Scr at the same time. Binary logistic regression shows: advanced age, left heart insufficiency, high dose of contrast agent before operation are the independent risk factors of CIN.

**Conclusions:** Short-term application of l-carnitine has the trend of lowering contrast-induced nephropathy in CHD patients with DM. The results show that urinary KIM-1 levels can be used as an indicator for early diagnosis of CIN.

#### GW25-e2520

##### The availability of stent enhancement to guide percutaneous coronary intervention for ostial lesions by stent boost subtract imaging: comparison with intravascular ultrasound

Zhang Jiao<sup>1</sup>, Duan Yuanyuan<sup>2</sup>, Jin Zhigeng<sup>1</sup>, Yang Shengli<sup>1</sup>, Luo Jianping<sup>1</sup>, Liu Huiliang<sup>1</sup>

<sup>1</sup>Department of Cardiology, General Hospital of Chinese People's Armed Police Forces, <sup>2</sup>Department of South, General Hospital of Chinese People's Armed Police Forces

**Objectives:** Percutaneous coronary intervention (PCI) of ostial lesions is complex and is technically very demanding. Intravascular ultrasound (IVUS) is considered the gold standard method to guide PCI but has several limitations. Stent Boost Subtract (SBS) imaging is an enhancement of the radiologic edge of the stent by digital management of regular X-ray images. The purpose of this study is to determine the availability of stent enhancement with SBS during ostial PCI by comparison with intravascular IVUS.

**Methods:** We investigated SBS and IVUS after stent implantation in 58 ostial lesions in 55 patients. Ostial lesions included both native aorto-ostial or major coronary vessel lesions. SBS and IVUS was performed in all patients to obtain improved stent location and to detect optimal release and deployment.

**Results:** We defined the SBS and IVUS criteria for adequate stent deployment. IVUS findings showed inadequate stent deployment in 10/58 observations (17.2%). Eight SBS images showed inadequate stent expansion. SBS predicted inadequate findings of IVUS with 100% specificity, 80% sensitivity, meanwhile, a significant positive correlation was observed between SBS-MSA and MSA by IVUS with a regression coefficient of 0.95.

**Conclusions:** Imaging techniques have a primary role during ostial PCI. SBS is a simple and quick method that offers several advantages, enabling improved stent location, adequate stent expansion and optimal apposition of the struts to the wall. SBS imaging could be conventionally used during ostial PCI, especially in centers where IVUS is not used routinely.

#### GW25-e3414

##### Clinical Study of Coronary Artery Lesion in Patients With Angina Pectoris by Virtual Histology Intravascular Ultrasound

Wang Xiaomei, Zhang Jian

TEDA International Cardiovascular Hospital, Cardiovascular Clinical College of Tianjin Medical University

**Objectives:** To observe the characteristics of coronary artery lesion in patients with unstable and stable angina by virtual histology intravascular ultrasound.

**Methods:** A total of 199 patients with angina pectoris were enrolled in our study, they were divided into stable angina group (101 cases) and unstable angina pectoris group (98 cases) according to clinical symptoms, ECG and myocardial enzyme. Coronary angiography to determine the "criminals" vessels. Comparison of the coronary artery lesions' indicators in minimal lumen area measured by grayscale and virtual histology intravascular ultrasound were made between the unstable angina group and stable angina group respectively. Grayscale intravascular ultrasound index: external elastic membrane (EEM), lumen cross-sectional area (LA), plaque area (PA), plaque burden (PB), remodeling index (RI), plaque eccentricity index (EI); Virtual histology intravascular ultrasound index: the plaque composition of calcified tissue, fibrous tissue, lipid tissue and necrotic tissue.

**Results:** Two sets of results at the external elastic membrane area, lumen area, plaque area, eccentricity index, remodeling index have no significant difference ( $t=1.392, -0.345, 1.921, 0.378, 0.857, P>0.05$ ). Compared with stable angina group, unstable angina pectoris group in minimal lumen area have larger external elastic membrane area, smaller lumen area, greater plaque area, the greater the eccentric index and remodeling index. Necrotic core (red) area and percentage of lesion composition in unstable angina group was significantly higher than that in stable angina group ( $t=2.361, 2.418 P<0.05$ ). Two sets of results at lipid and calcification area and plaque distribution percentage have no statistically significant differences ( $t=1.045, 1.884, 0.787, P>0.05$ ).

**Conclusions:** Necrotic core area and percentage of plaque composition in the unstable angina group is larger. "Criminals" lesions are more unstable and more easily complicated with acute cardiovascular events.