GW25-e0396

Progression of carotid atherosclerosis and associated risk factors in elderly Chinese population

Song Canlou1, Zhao Chunlou1, Nasheen Naidoo2, Zhou Huijou1, Tong Huyan1

1Naval Community Clinic, 2Naval General Hospital, 3Medical and Health Sciences University of Stellenbosch, 4LL School of Medicine

Objectives: Carotid atherosclerosis (CA) is considered the preclinical stage of stroke which claims 6 million lives worldwide. Identifying significant risk factors for CA progression will be a useful practice to prevent stroke for a specific population. The objectives of this study were to monitor the CA progression in an elderly Chinese population and to identify significant risk factors associated with CA progression for public health intervention.

Methods: A community-based prospective study was conducted in the Navy Community Clinic in Beijing, China. Totally 91 residents were followed up from 2007 to 2012 with ultrasound measurement of plaques located in the common carotid artery and the internal carotid arteries on both sides. The detailed information on potential risk factors was also collected for every subject. Using total area of all plaques as primary outcome measure, the generalized linear model was performed to identify significant risk factors for plaque growth.

Results: With a mean age of 71.09 years, this sample represented the elderly Chinese under usual medical care. The mean total plaque area has increased 0.104cm² (95% CI 0.02-0.20) over 5-year follow-up period. In multivariate analysis, medical history of stroke, pre-existing CA and diabetes were significant risk factors for plaque growth each respectively associated with additional increase of 0.16 cm², 0.12 cm² and 0.11 cm² in total plaque area.

Conclusions: CA can progress significantly in the elderly Chinese under usual medical care thus elevates the risk of stroke. Therefore, clinical interventions should be provided in a timely fashion, especially for those with pre-existing CA, diabetes or medical history of stroke. The total plaque area in carotid arteries is the most sensitive ultrasound measure for the purpose of monitoring the stroke risk and evaluating the treatment effect.

GW25-e0807

Computed tomography perfusion to detect and differentiate ischemic and infarcted myocardium: experiences in a large experimental animal model

Qin Jie1, Bai Mingjun1, Wang Xiaoli2, Huang Shaohong2

1Department of Radiology, The Third Affiliated Hospital of Sun Yat-Sen University, Guangzhou 510630, China, 2Department of Ultrasound, The Third Affiliated Hospital of Sun Yat-Sen University, Guangzhou 510630, China

Objectives: The aim of the study is to determine whether computed tomography perfusion (CTP) can detect and differentiate ischemic and infarcted myocardium in a large animal model.

Methods: 12 pigs completed either implantation of a 75% luminal coronary stenosis (IQR, 106.8-326.4 mGy cm) to 218 mGy cm (IQR, 106.8-326.4 mGy cm). In multiple regression that combined all groups, decreases in median radiation doses in all cohorts significantly were observed in median radiation doses in all cohorts (P < 0.001). Median dose-length product fell from 394 mGy cm (interquartile range [IQR] 570.8-1646.5 mGy cm) to 218 mGy cm (IQR, 106.8-326.4 mGy cm). In multiple regression that combined all groups, decreases in median radiation doses in all cohorts significantly were observed in median radiation doses in all cohorts (P < 0.001). Median dose-length product fell from 394 mGy cm (interquartile range [IQR] 570.8-1646.5 mGy cm) to 218 mGy cm (IQR, 106.8-326.4 mGy cm). In multiple regression that combined all groups, decreases in median radiation doses in all cohorts significantly were observed in median radiation doses in all cohorts (P < 0.001). Median dose-length product fell from 394 mGy cm (interquartile range [IQR] 570.8-1646.5 mGy cm) to 218 mGy cm (IQR, 106.8-326.4 mGy cm).

Conclusion: CTP can be able to detect ischemic and infarcted myocardium and differentiate them from each other.

GW25-e0808

Myocardial computed tomography perfusion for assessment of myocardial ischemia and infarction compared with magnetic resonance imaging

Qin Jie1, Bai Mingjun1, Wang Xiaoli2, Huang Shaohong2

1Department of Radiology, The Third Affiliated Hospital of Sun Yat-Sen University, Guangzhou 510630, China, 2Department of Ultrasound, the Third Affiliated Hospital of Sun Yat-Sen University, Guangzhou 510630, China

Objectives: The purpose of this study was to determine the feasibility of myocardial computed tomography perfusion (CTP) for the assessment of myocardial ischemia and infarction compared with cardiac magnetic resonance imaging (MRI).

Methods: 82 patients with coronary artery disease who underwent adenosine stress dynamic 320-slice CTP and MRI (3-T) were enrolled. Estimated myocardial blood flow (eMBF) and estimated myocardial blood volume (eMBV) were derived from CT images, using a model-based parametric deconvolution technique. The values were independently related to perfusion defects (ischemic and/or infarcted myocardial segments) as visually assessed during rest/stress and late gadolinium enhancement MRI. Conventional measures of diagnostic accuracy and differences in eMBF/eMBV were determined.

Results: 82 enrolled subjects, 60 (mean age 50.6±9.2 years; 75% men) completed both CTP and cardiac MRI protocols. The prevalence of ischemic and infarcted myocardial segments detected by MRI was moderate (11.6%, n=56 and 12.6%, n=61, respectively, of 484 analyzed segments, with 8.4% being transmural). The diagnostic accuracy of CTP for the detection of any perfusion defect was good (eMBF threshold, 88 mUg/min/100 g; sensitivity, 77.8% [95% CI 69%-85%]; negative predictive value, 91.9% [95% CI 86%-94%]) with moderate positive predictive value (50.6% [95% CI 43%-58%] and specificity (75.4% [95% CI 70%-79%]). Higher diagnostic accuracy was observed for transmural perfusion defects (sensitivity 87.8%; 95% CI 74%-96%) and infarcted segments (sensitivity 85.3%; 95% CI 74%-93%). eMBF was not different between ischemic and infarcted segments (72.3±18.7 mUg/min/ml vs 73.1±13.9 mUg/ml/min, respectively, P>0.05). eMBV was significantly lower in infarcted segments compared with ischemic segments (11.3±3.3 mU/ml vs 18.4±2.8 mU/ml, respectively; P<0.01).

Conclusions: Compared with cardiac MRI, dynamic stress CTP provides good diagnostic accuracy for the detection of myocardial perfusion defects and may differentiate ischemic and infarcted myocardium.

GW25-e0813

Radiation dose in 320-slice computed tomography coronary angiography: cohort study in one single center

Qin Jie1, Hao Baoshun2, Liao Hongying3

1Department of Radiology, the Third Affiliated Hospital of Sun Yat-sen University, Guangzhou 510630, China, 2Division of Cardiology, the Third Affiliated Hospital of Sun Yat-sen University, Guangzhou 510630, China, 3Division of Cardiothoracic Surgery, the Third Affiliated Hospital of Sun Yat-sen University, Guangzhou 510630, China

Objectives: The aim of the study was to determine whether a combination of dose-reduction protocols and technical improvements could decrease the radiation dose while maintaining diagnostic quality in 320-slice computed tomography coronary angiography (CTCA).

Methods: Four cohorts of consecutive patients (total 640 scans), who underwent CTCA from January 2009 to January 2014, are described. These include a cohort just after scanner installation, after 2 upgrades of the operating system, and after introduction of an adaptive iterative image reconstruction algorithm. The proportions of nondiagnostic coronary artery segments and studies with nondiagnostic segments were compared between cohorts.

Results: Significant reductions were observed in median radiation doses in all cohorts compared with the initial cohort (P<0.001). Median dose-length product fell from 1060 mGy cm (interquartile range [IQR] 570.8-1646.5 mGy cm) to 218 mGy cm (IQR, 106.8-326.4 mGy cm). In multiple regression that combined all groups, decreases in median radiation doses in all cohorts significantly were observed in median radiation doses in all cohorts (P<0.001). Median dose-length product fell from 1060 mGy cm (interquartile range [IQR] 570.8-1646.5 mGy cm) to 218 mGy cm (IQR, 106.8-326.4 mGy cm). In multiple regression that combined all groups, decreases in median radiation doses in all cohorts significantly were observed in median radiation doses in all cohorts (P<0.001). Median dose-length product fell from 1060 mGy cm (interquartile range [IQR] 570.8-1646.5 mGy cm) to 218 mGy cm (IQR, 106.8-326.4 mGy cm). In multiple regression that combined all groups, decreases in median radiation doses in all cohorts significantly were observed in median radiation doses in all cohorts (P<0.001).

Conclusion: While maintaining diagnostic quality in 320-multidetector row cardiac CT, the radiation dose had decreased significantly because of a combination of dose-reduction protocols and technical improvements.

GW25-e0824

Analysis of clinical, anatomical and echocardiography parameters correlated with coronary slow flow phenomenon

Li Yijia, Ma Ning, Zhang Chuan, Li Rongjuan, Xue Jingli, Yang Jiao, Yang Ya

1Department of Echocardiography, Beijing An Zhen Hospital affiliated to Capital Medical University

Objectives: To analysis of clinical, anatomical and echocardiography parameters correlated with coronary slow flow phenomenon.

Methods: This study consecutively enrolled 124 patients with coronary slow flow phenomenon (CSFP) and 134 control subjects with angiographically normal coronary flow detected by coronary angiography from March 2008 to September 2013. Corrected thrombolysis in myocardial infarction frame count (Corrected TIMI Frame Count, CTFC) was used to document coronary flow rates. Recording the related clinical, echocardiography, coronary anatomical and basic echocardiography parameters of all patients, and coronary slow flow detected patients with angiographically normal coronary flow detected by coronary angiography from March 2008 to September 2013. Corrected thrombolysis in myocardial infarction frame count (Corrected TIMI Frame Count, CTFC) was used to document coronary flow rates. Recording the related clinical, echocardiography, coronary anatomical and basic echocardiography parameters of all patients, and coronary slow flow detected patients.

Comparison of categorical and continuous variables between the two groups was performed using chi-square test and independent-samples t test respectively. Multivariate analysis evaluating predictors of coronary slow flow was performed using logistic regression test. Linear regression analysis was used to test univariate relation. Medical diagnostic trial evaluation was assessed by receiver operating characteristics (ROC) curve.