ABSTRACTS

Abstracts for Free Paper Session:

PAEDIATRIC CARDIOLOGY I

Analysis of Arrhythmia and Follow-up After Transcatheter Closure of Secundum Atrial Septal Defect in Children

ZHANG Li, WANG Zhou-ping, XIA Shu-liang, YU Ming-hua , GUO Yan, HUANG Xiao-ming, XIE Jia-er, ZHOU Hui-ming
Department of Pediatrics Cardiology, Guangzhou Women and Children's Center, China

Purposes: To analyze the information and outcome of the transactheter closure of secundum atrial septal defect (ASD)in children from January 2006 to November 2011.

Methods: One hundred thirty-three patients （male 56，female 77）with the secundum atrial septal defect were treated successfully with occluder device through percutaneous procedur. The patients were assessed with echocardiograph, twelve—lead electrocardiography and chest X-ray before and after transcatheter closure and during follow-up. Analyze the information and outcome of successful closure.

Results: 8 (male 5, female 3) patients occured arrhythmia after ASD occlusion. They were aged from 5.1 to 7.8 (average, 6.5) years, weight from 16.5 to 24 (average, 18.7) kg, the diameter of device from 20 to 28 (average, 23) mm. Arrhythmia occurred in three day after occlusion. Five of eight patients used the devices whose diameter were 4 mm more than the big size of defect measured by echocardiography. First-degree atrioventricular block (AVB), second-wenckebach, third-degree AVB, and junctional tachycardia were seen in 5, 1, 1 and 1 case, respectively. One patient had First-degree AVB after the first day of occlusion. During intervention. This patient transiently occurred second-wenckebach. We injected a bonus of dexamethasone, then return to sinus rhythm. In another patient, she was 5.2 years old. The size of the defect measured by echocardiography were 12-14 mm. Interatrial septum were 37 mm, we implanted 20 mm occluder. Third-degree AVB was found in the first day. She had supportive treatment. But it had little effect on AVB. So she was removed occluder and made ASD repair after six day of intervention. But she was still third-degree AVB after surgery and during a two-year follow-up. Other patients were recovered well and had no new arrhythmia in one to two years follow-up.

Conclusions: Transactheter closure of atrial septal defect in children is satisfactory in a whole. Transcathether occlusion of ASD has a likelihood of happening arrhythmia. Arrhythmia are mostly happened in implanting bigger size of occluder and in a week of closure. Most of arrhythmia are reversible after routine treatment. The prognosis is good.

Postoperative mortality and respiratory complications in heterotaxy patients with congenital heart disease and their relationship with ciliary dysfunction

Weicheng Chen[1], Yuan Yuan[1], Xiaojing Ma[1], Fang Liu[1], Bing Jia[1], Duan Ma[2], Guoying Huang[1,2]
[1] Pediatric Heart Center, Children's Hospital of Fudan University, Shanghai, China
[2] Institute of Biomedical Science, Fudan University, Shanghai, China

Background and Objective: CHD patients with heterotaxy show high postsurgical morbidity/mortality, with some developing respiratory complications. While this is often attributed to the CHD, airway clearance and left-right patterning both require motile cilia function. Recent studies have revealed an association among heterotaxy, congenital heart disease, and primary ciliary dyskinesia (PCD). Thus airway ciliary dysfunction (CD) similar to that of PCD may have relevance for increased respiratory complications in heterotaxy patients. Thus we explore the mortality and respiratory complications in heterotaxy patients as compared to CHD patients without heterotaxy in china, and then we investigate the effects of CD on increased respiratory complications in heterotaxy patients.

Methods: A retrospective review of patients undergoing cardiac surgery was undertaken at our hospiatl between Jan, 1st, 2000 and Dec, 31st, 2011, which was performed on postsurgical outcomes of 107 patients with heterotaxy and congenital heart disease exhibiting the full spectrum of situs abnormalities associated with heterotaxy. As controls patients, 867 cardiac surgical patients with congenital heart disease, but without laterality defects, were selected, and surgical complexities were similar with a median Risk Adjustment in Congenital Heart Surgery-1 score of 3.0 for both groups. For prospective CD study, 37 CHD patients with heterotaxy were recruited, and 51 CHD patients without heterotaxy and 100 healthy persons were also recruited as controls. Videomicrocopy was used to examine ciliary motion in nasal tissue, and nasal nitric oxide (nNO) was measured by NO analyser.

Results: We found the postsurgical deaths (16.8% vs 4.7%; OR, 3.0), mean length of postoperative hospital stay (12.7 vs 9.1 days) and mechanical ventilation (57 vs 42 hours) were significantly increased in the heterotaxy patients. Also elevated were rates of prolonged ventilatory courses (6.5% vs 2.1%; OR, 3.1), critically ill notice (13.1% vs 5.8%; OR, 2.4), salvage (11.2% vs 5.1%: OR, 2.3), fever (66.4% vs 34.9%; OR, 3.7) and rales (30.0% vs 18.9%: OR, 1.8). For prospective study, 16 patients (43.2%) exhibited CD characterized by abnormal ciliary motion among total 37 heterotaxy patients, compared with 4 patients with CD among total 51 CHD controls (7.8%) and 1subject with CD among 100 health controls (1%). Among 16 heterotaxy patients with CD, 10 patients' appeared below or near the PCD cutoff values, compared with all normal nNO levels in CHD controls and health controls.

Conclusions: Our findings show heterotaxy patients had more postsurgical events with increased postsurgical mortality and risk for respiratory complications as compared to control patients with similar Risk Adjustment in Congenital Heart Surgery-1 surgical complexity scores. Prospective CD study show that CHD patients with heterotaxy have substantial risk for CD with low nNO. We speculate that CD contribute to the increased mortaliy and respiratory complications in heterotaxy patients.

Vascular Mechanics at Rest and During Exercise after Arterial Switch Operation for Complete Transposition of the Great Arteries

Robin HS Chen, Wilfred HS Wong, YF Cheung
Department of Paediatrics and Adolescent Medicine, Queen Mary Hospital,
The University of Hong Kong, Hong Kong

Background: Progressive neoaortic root dilatation and regurgitation after arterial switch operation (ASO) for complete transposition of the great arteries (TGA) are well documented. We tested the hypothesis that neoaortic stiffness is increased and is associated with neoaortic dilatation in patients after ASO. We further explored the changes in mechanics of the neoaorta during exercise stress.

Methods: Thirty patients (22 males) aged 16.2±2.1 years and 22 healthy controls (15 males) were studied. Central and peripheral arterial pulse wave velocity (PWV), carotid (c-AI) and radial (r-AI) augmentation indices and central systolic blood pressure (cSBP) were assessed by applanation tonometry. Dimensions of the aortic annulus, sinus, sinotubular junction, ascending aorta, and right carotid artery dimensions were determined at rest and during exercise by 2-dimensional echocardiography. Aortic strain, distensibility, aortic and carotid stiffness indices were calculated.

Results: At rest, patients compared with controls had higher c-AI, heart-carotid PWV, CsBP, and r-AI (all $p<0.05$), while brachial-ankle arterial PWV were similar. During at rest and exercise, patients had significantly lower aortic strain and distensibility, and significantly greater systolic blood pressure, and aortic and carotid stiffnes ($p<0.05$). Aortic root dimensions at all levels were significantly greater in patients compared with controls (all $p<0.05$). Patients with aortic dilatation had higher cSBP and aortic stiffness at rest, and lower aortic strain and distensibility at rest and at submaximal exercise (all $p<0.05$). Linear regression model identified resting aortic stiffness ($\beta=0.464$, $p=0.003$) and age at operation ($\beta=0.40$, $p=0.005$) as significant determinants of aortic sinus z score. Significant aortic regurgitation was identified in 20% (6/30) of patients, in whom significant higher z scores for aortic annulus and sinotubular junction were found (both $p<0.05$).

Conclusions: In adolescents late after ASO for TGA, aortic root dilatation and regurgitation is prevalent and is associated with stiffening of central arteries at rest and during exercise.

Genome-wide expression profile of pediatric patients with Vasovagal Syncope

Yu-Juan Huang, Zai-wei Zhou, Miao Xu, Qing-wen Ma, Jing-bin Yan, Jian-yi Wang, Quo-qin zhang , Yan-feng Lu, Qin Lu, Hong Tian, Li-Ming Bao, Min Huang
Department of Pediatrics，Shanghai Children's Hospital , Shanghai Jiao Tong University, Shanghai 200040, China

Vasovagal syncope (VVS) is easy to cause accident harm of teenagers and getting a lot of attention lately. A novel insight into the pathophysiology of VVS obtained by studying gene expression should help to discover novel biomarkers of VVS and to suggest novel strategies of therapy. The aim of our study was to establish gene expression patterns in leukocytes from syncope patients.

Ten patients with head-up tilt test (HUT) induced syncope were included. The blood was collected on the time of positive reaction during the HUT. Control group comprised 10 children without history of syncope and had a negative HUT. The blood was collected on the time of the HUT was finished. Gene expression analysis was performed with Affymetrix Human Gene 1.0 ST microarrays and GCS3000 TG system. Lists of genes showing altered expression levels (fold change>1.2, $p<0.05$) were submitted to Ingenuity Pathway Analysis. Gene lists were examined for canonical pathways and molecular and cellular functions. Comparing syncope with positive HUT and control group we found 103 genes with changed expression (100 were up- and 3 down-regulated). Comparing VVS group with control group, dozens of genes from several pathways linked with apoptosis, B cell receptor signaling pathway, G protein-coupled signal transduction pathway show altered expression. Up-regulation of GNG2 and GPR174 genes in vasovagal syncope is observed in the vast majority of patients.

This is the first genome-wide expression study for Syncope patients which provides a new insight into the molecular mechanism of VVS.