

P2276 Health care expenditures in adult patients with congenital heart disease

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Congenital heart disease may be a chronic condition, necessitating life-long follow-up for a substantial proportion of this patient population. Patients are presumed to be high users of health care resources. This study examined the reimbursements and out-of-pocket expenses; compared these with data of the general population; and explored demographic and clinical parameters as predictors for health care expenditures.

Methods: This retrospective study included all congenital heart patients of 18 years or older, treated and followed-up at our hospital, who were examined at an in- or out-patient visit between July 1 1996 and December 31 1996. The convenience sample consisted of 192 subjects (57.3% m / 42.7% f) with a median age of 21.8 (Q1=19.3; Q3=26.9) years. Demographic and clinical data (independent variables) – referring to the condition at the last examination in 1996 – were collected from the medical records, to assess whether they predict health care expenditures in 1997. Data on reimbursements and out-of-pocket expenditures during 1997 (dependent variables) were retrieved by 3 participating Health Insurance Associations (sickness funds).

Results: The average reimbursement in 1997 was 1795 ECU (median: 256), while patients paid on average 190 ECU (median: 54) out-of-pocket. However, these results are dominated by three outliers for whom the reimbursement was 36120 ECU, 44331 ECU and 66000 ECU, respectively, due to a heart-(lung) transplantation. After exclusion of these outliers for further analysis, average reimbursement decreased to 1048 ECU (median: 252) and out-of-pocket expenses declined to 164 ECU (median: 52). Expenditures for congenital heart patients were considerably higher than the sex- and age-corrected expenditures for the general population (437.5 ECU), though only patients with reimbursement of >2500 ECU (11.1%) were responsible for this difference. High health care users among congenital heart patients (>2500 ECU) were characterized by a higher age ($U=1285$; $p=0.008$), more symptoms of left heart failure ($\chi^2=4.789$; $p=0.029$), a higher degree of mitral valve insufficiency ($U=1492$; $p=0.048$) and an abnormal left ventricle end-diastolic diameter ($\chi^2=3.855$; $p=0.05$).

Conclusion: This study suggested that health care expenditures for the majority of congenital heart patients (88.9%) were comparable with the general population. Relevant parameters to detect patients at risk for higher health care utilization were identified. This information is needed for updating existing guidelines for health insurance in congenital heart patients.

P2277 Cardiopulmonary results and long-term follow-up of adults with the mustard procedure

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Background: Most patients with the Mustard procedure are now adults. However, there have been few reports on resting and exercise hemodynamic data in a large adult population. The aim of this study is to describe these characteristics in one of North America's largest population of Mustard (procedure) patients.

Methods: The database of the University of Toronto Congenital Cardiac Center for Adults was examined to identify adults with the Mustard procedure who have had cardiopulmonary tests. Magnetic resonance imaging was obtained in order to characterize right ventricular size, function and baseline hemodynamics. As well, pre-Mustard catheter and operative data were examined for relationships to exercise capacity.

Results: Eighty-four patients with the Mustard procedure were identified. Adults with the Mustard procedure achieved lower maximum oxygen uptake for a given age group for both males and females than a healthy population. As well, maximum heart rate, forced vital capacity, forced expiratory volume in one second and oxygen saturations were depressed in the Mustard cohort when compared to a healthy population. Magnetic resonance imaging demonstrated statistically significant differences between a healthy group and patients with the Mustard procedure with respect to ejection fractions however; ejection fractions remained on average within the normal range. Furthermore, there were no effects of pre-Mustard catheter or operative data on exercise capacity.

Conclusion: The present study demonstrates that Mustard patients, while asymptomatic with normal activity have subnormal exercise capacities while maintaining normal right systemic ejection fractions at rest and during maximal exercise. Other factors such as chronotropic incompetence, peripheral deconditioning and impaired lung function may be responsible for these results.

P2278 Transcatheter occlusion of atrial septal defect under complex conditions for treatment

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Percutaneous device occlusion of secundum atrial septal defect (ASD) is becoming an accepted alternative to surgical closure. This allows to evaluate patients with complex conditions for treatment.

Methods: From a total of 70 patients (pts) with ASD evaluated for percutaneous closure we selected for analysis 28 having complex conditions. These included: 1) Combined treatment of associated anomalies ($n=4$); 2) Multiple defects ($n=9$); 3) Large (>30 mm) single defect ($n=14$); 4) Pulmonary hypertension (86 ± 16 mmHg) ($n=6$); and 5) Residual defect after previous partial device occlusion ($n=3$). The mean age was 36 ± 23 years (range 4–72); 6 had heart failure, 3 of them having atrial fibrillation. At cardiac catheterization the pulmonary pressure was 47 ± 24 mmHg and the QP/QS 1.7 ± 0.4 ; 2 pts had bidirectional shunt and systemic pulmonary pressure. Two pts received a buttoned device and 27 an Amplatzer.

Results: Four patients with associated anomalies (2 pulmonary stenosis, 1 mitral stenosis, 1 aortic root-to-left atrium phystula) were treated in the same procedure with combined transcatheter techniques (balloon valvuloplasty and phystula occlusion) before ASD-occlusion. Nine pts having multiple orifices (cribriform or 2 separated holes) were treated with a single device in 4 instances and with 2 separated devices in 5. Fourteen pts had a large single defect (32 ± 3 mm); 9 of them had successful implantation using a device diameter of 33 ± 3 mm; in the remaining 5, the device was retrieved because of instability. Six patients with pulmonary hypertension showed a significant relief immediately after ASD occlusion (67 ± 14 mmHg; $p < 0.01$). Finally, 3 patients with residual shunt and previous devices in place were successfully occluded with a second device; no movements or interference with the first device were observed. No major complications occurred; all 23 patients with successful implant were discharged asymptomatic 2–7 days later; 1 patient with atrial fibrillation recovered sinus rhythm. The follow-up (8 ± 5 months) echo-doppler study revealed complete ASD-occlusion in 23 and a peak pulmonary pressure of 30 ± 12 mmHg.

Conclusions: Transcatheter occlusion of ASD is an effective and safe treatment for patients with complex anatomical or physiopathologic conditions.

P2279 Advantages of transcatheter secundum atrial septal defect closure in adults: a comparative study between transvenous and surgical correction

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Transcatheter closure of secundum atrial septum defect (ASD) is nowadays an effective, safe and accepted treatment method. In order to investigate the advantages of this procedure we performed a study in prospective/retrospective manner of 168 adult patients (pts) with ASD corrected transvenously by Amplatz occluder [AO] (38 pts) and surgically by suture or Dacron patch [SURG] (130 pts). We compared pre-early and late postprocedural cardiopulmonary performance (ergospirometry, pulmonary function [PF]), echocardiography, chest X-ray, complications, duration of hospital stay, reconvalescence in both groups.

Results: The analysis revealed:

- (1) comparable good results of both methods (ECHO, X-ray)
- (2) high significant lower incidence of complications ($p < 0.001$) and duration of hospital stay postprocedurally ($p < 0.005$) in the AO group
- (3) substantial decrease ($p < 0.001$) of PF parameters in the SURG group up to 6 months postoperatively, PF unchanged in the AO group
- (4) significant improvement of functional status immediately after closure in the AO group in comparison to SURG group
- (5) earlier improvement (3 vs 6 months) of ergospirometric parameters in AO group

Conclusion: Results of the study indicate that the transvenous approach in the correction of ASD is more advantageous to the pts in: **a)** lower morbidity **b)** immediate improvement of functional status, earlier upturn of cardiopulmonary performance **c)** short hospital stay, reconvalescence and early work ability by presuming standardized good procedure outcomes. Two more advantages seem to be the cosmetic effect and costeffectiveness.