

Conclusions Blood lactate, base excess, leukocyte count and percentage of bastonades are suitable markers of mortality. Blood glucose, central venous oxygen saturation and cardiac troponin-I are valued predictors of sepsis, and the last two were also reliable markers of MODS and CPR marker only the latter.

1657 MORTALITY IN POST-CARDIAC SURGERY IN CHILDREN: THE ROLE OF MULTIPLE ORGAN DYSFUNCTION

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Background and Aim The multiple organ dysfunction syndrome (MODS) is associated to worse prognosis in critical setting. Its role after open heart surgery is still purely studied.

Methods We made a retrospective cohort of 121 children to study factors associated to mortality after open heart surgery such as systemic inflammatory response syndrome (SIRS), MODS, sepsis, low cardiac output syndrome (LCOS), respiratory and cardiac support time.

Results 7.4% of non survivors occurred. The presence of sepsis in the first postoperative day had the highest odds ratio (OR) = 31.71 (2.6 to 393.8), followed by renal dysfunction on the third day, OD=14.1 (2.9 to 66.6); uni ventricular correction, OD=14.2 (2.9 to 66.66); the presence of MODS on the third day, OD=10.0 (1.9 to 50.9); presence of LCOS on the fifth day, OD=9.1 (2.1 to 40.2); and cardiac and respiratory dysfunction in the fifth day, OD=6 (1.4 to 25.6). On the other hand, the absence of SIRS in the immediate postoperative period was protective, with OD=0.92 (0.87 to 0.97). Furthermore, the mean time of cardiac support was higher in non survivors (98.8 vs. 53.7 hours), also respiratory support (42.2 h vs. 87 hours) and time of hypotension (85.2 h vs. 62.2 hours) than in survivors ($p < 0.05$).

Conclusions The increased risk of mortality due to MODS appears to be caused by primary cardiac dysfunction, as there is also an association with LCOS, renal and respiratory dysfunctions secondary to the first.

1658 ACUTE KIDNEY INJURY AFTER HEART SURGERY IN CHILDREN

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Background and Aims Acute kidney injury (AKI) has been associated to adverse outcomes in children after heart surgery, but previous studies have used several different definitions of AKI. After publication of the pediatric RIFLE (pRIFLE) criteria, it has been widely used as a definition for AKI in children. This study aims to investigate association between occurrence of AKI according to pRIFLE criteria and adverse outcomes in children after heart surgery.

Methods Children submitted to open heart surgery in a hospital in Brazil were followed from arrival until death or discharge from the Pediatric Intensive care Unit (PICU). The exposition variable was occurrence of AKI according to pRIFLE criteria, which divides AKI in three categories: R-Risk, I-Injury, F-Failure, according to changes in urine output or the estimated glomerular filtration rate. The outcomes studied were death, length of mechanical ventilation (MV) and length of PICU stay.

Results Eighty five children were studied. Forty seven (55.3%) did not have AKI during PICU stay, while 22 (25.9%), 7 (8.2%) and 9 (10.6%) were classified as R, I and F, respectively. Comparing to children who did not develop AKI, the relative risk for death was

1.07 (0.09–12.48), 16.87 (2.14–132.50) and 11.25 (1.55–81.61) in the R, I and F group, respectively ($p = 0,001$). Lengths of MV and of PICU stay were significantly higher in those with any degree of AKI.

Conclusions Occurrence of AKI according to pRIFLE criteria is associated to adverse outcomes in children after open heart surgery.

1659 POST - OPERATIVE ICU COURSE OF INFANT BELOW 2.2 KG UNDERGOING CARDIAC SURGERY

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Introduction Infants with low body weight (LBW) are major challenges for post cardiac surgery care. We conducted this study to compare post-operative course and outcome of infant weighing 2.2 Kg or less with matching group of infants with normal body weight who underwent similar cardiac surgery.

Methods We reviewed retrospectively all infants below 2.2 kg who underwent cardiac operation at our institution from January 2001 to March 2011. Cases with LBW (group A) were compared with matching group (Group B) of normal body weight infants who had similar cardiac surgery and matching surgical risk category. We compared demographic, ICU parameters, complications and short-term outcome of both groups.

Results Thirty seven patients were included in group A and 39 in group B. Except for Weight (2.13 ± 0.08 kg in Group A vs. 3.17 ± 0.2 kg in group B); there was no statistical difference in demographic data between both groups. Cardiac procedures included coarctation repair, Arterial switch, VSD repair, tetralogy of Fallot repair, systemic to pulmonary shunt and Norwood procedures. Patients in group A had statistically significant difference from group B in term of bypass time ($p = 0.01$), duration of inotropes ($p = 0.01$), duration of mechanical ventilation ($p = 0.004$), number of re-intubations ($p = 0.015$), PCICU length of stay ($p = 0.007$) and mortality (13.5% in group A vs. 0% in group B, p value 0.02).

Conclusion Patients with LBW below 2.2 Kg can go for cardiac surgery with overall satisfactory result but with increase risk of ICU morbidity and mortality.

1660 RISK FACTORS FOR MORTALITY AFTER TRANSCATHETER INTERVENTION AFTER CARDIAC SURGERY IN CHILDREN WITH CONGENITAL HEART DISEASE

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Aim Risk stratification for mortality after cardiac catheterization in early post-operative children.

Introduction Transcatheter intervention has evolved overtime to expose high risk, sick children to such procedures. The risk of dying, rises significantly in emergent and critically sick patients. Rarely published, we reviewed records of 35 patients, 43 procedures during immediate/early post operative period after cardiac surgery for congenital heart disease.

Methods Multivariate analysis for age, weight, sex, time between surgery/intervention, and the intervention on natural vasculature/synthetic material, was done, as possible risk factors for mortality.

Results Thirty patients survived and cleared from ICU in due course. None of the risk factors could be attributed to the mortality.

Multivariate analysis for all risk factors proved statistically insignificant.

Abstract 1660 Table 1 Multivariate risk stratification

| Factors | Group | Patients | Procedures | Mortality | p value |
|-----------------------------|-----------------------|------------|------------|-----------|---------|
| Age (months) | < 1 Bet 1–12 > 12 | 6 18 11 | 8 21 14 | 1 3 1 | 0.79 |
| Weight (kg) | <2.5 2.6–5 5.1–10 >10 | 3 12 12 8 | 3 14 15 11 | 0 3 1 1 | 0.51 |
| Sex | Male Female | 21 14 | 27 16 | 3 2 | 0.89 |
| Time bet surg/ Inter (days) | <1 1–3 3–5 5–7 >7 | 3 4 6 5 18 | 3 7 7 5 21 | 0 1 1 1 2 | 0.69 |
| Material | Native Synthetic | 27 6 | 35 6 | 4 1 | 0.80 |

Abstract 1660 Table 2 Multifactorial comparison between mortality and survival

| Factors | Group | Mean | SD | Range | p value |
|----------------------------------|--------------------|------|------|----------|---------|
| Age (months) | Mortality Survival | 11 | 14.6 | 0.3–36 | 0.792 |
| | | 21.2 | 40.9 | 0.3–192 | |
| Weight (kg) | Mortality Survival | 6.6 | 6.3 | 2.7–17.5 | 0.513 |
| | | 7.3 | 5.8 | 1.9–33.9 | |
| Time (days)bet surg/intervention | Mortality Survival | 7.8 | 5.4 | 3–17 | 0.399 |
| | | 13.5 | 14.8 | 1–59 | |

Conclusion We conclude that transcatheter intervention in critically sick patients during immediate post operative period is safe in expert hands and in a fully equipped facility, backed up by multi specialty team.

1661 COMPUTATIONAL FLUID DYNAMICS SIMULATION OF PRESSURE CHANGES IN THE TRACHEA BEFORE AND AFTER VASCULAR RING SURGERY: THE FEASIBILITY ANALYSIS

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Background Effective relief of tracheal stenosis (TS) caused by complete vascular ring (CRV) is mandatory for vascular ring surgery (VRS). Even the forced expiratory volume in the first second (FEV1) measurement is usually applied to assess TS caused by CVR, here has been little research about the quantitative approach for analyzing the airway. Our purpose will apply the computational fluid dynamic (CFD) technique to evaluate the change of tracheal airway pressure by VRS.

Methods 12 patients with CVR and TS were found of pressure drops across the tracheal airway segment of TS before and after the VRS. CFD was performed to obtain the velocity field and viscous pressure drops in a realistic, three-dimensional, patient-specific model. The tracheal aerodynamic resistance was represented as a pressure drop in the tracheal airway. Three velocities (0.01, 0.1, and 1 m/s) were used to calculate the pressure drop in the tracheal airway for both inspiratory and expiratory flow patterns.

Results The pressure drops of the TS before and after the VRS at inlet velocity 0.1 m/s was improved 45.95% in inspiratory phase and 40.65% in expiratory phase. When the inspiratory inlet velocity reached 1 m/s, the pressure drop became improved of 43.32%. CFD showed a surgical treatment can significantly decrease the pressure drop in the tracheal airway, especially in a low inlet velocity.

Conclusion CVR can augment the airway flow resistance of TS. The CFD approach can be a useful alternative for quantifying the change of airway resistance and evaluating the effectiveness of VRS.

1662 OUTCOME OF COGNITIVE PERFORMANCE IN SCHOOL-AGED CHILDREN AFTER SURGICAL CORRECTION OF CONGENITAL VASCULAR RING

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Objective Our goal in this study is to assess the impact of congenital vascular ring (VR) on cognitive performance and its outcome after surgical correction.

Background The clinical indication for VR abnormalities relies on symptoms of tracheal and esophageal compression. However, the possible influence of VR on neurocognitive function and intelligence in school-aged children has yet to be examined.

Methods Patients with VR (n=78), which divided into two groups, partial (PVR) or complete vascular ring (CVR), and 30 normal controls were analyzed with Wechsler Intelligence Scale for Children-III (WISC-III) to assess the intellectual abilities before and one year after surgical intervention.

Results The initial assessment showed that the overall performances of the two VR groups on all the intelligence measurements are significantly lower than the control group. Nevertheless, the post-operational assessment of the VR groups one year later had shown significant improvement in most of the intelligence categories measured.

Conclusions The current results indicate a strong possibility of the influence of VR on neurocognitive development in school-aged children which is prompt to improve after surgical intervention is applied.

1663 EARLY CORONARY FLOW AND ECG CHANGES FOLLOWING CARDIOPULMONARY BYPASS SURGERY IN CHILDREN WITH CONGENITAL HEART DISEASE

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Background Surgery with cardiopulmonary bypass (CPB) remains the mainstay of therapy in children with congenital heart defects but little is known about its pathophysiologic consequences. We have recently demonstrated that CPB surgery in children leads to increase in coronary flow for at least 1 week after surgery, while others have shown, yet in adults, profound adverse effects of CPB on myocardial repolarization over the same period of time. The latter may be an important mechanism of ventricular arrhythmia, which is a common complication after CPB surgery.

Objective To investigate the relationship between coronary flow and myocardial repolarization after CPB surgery.

Methods Coronary flow in the proximal part of the LAD and indexes of myocardial repolarization (QT interval corrected for heart rate (QTc) and QT dispersion) were assessed by transthoracic Doppler echocardiography and in 12-lead surface electrocardiogram, respectively, in children with atrial (n=12) and atrioventricular septal defects (n=16) 1 day before, and 5 days after cardiac surgery with CPB.

Results Neither QTc nor QT dispersion postoperatively differed significantly compared with preoperative values ("p for mean">0.2 for both). However postoperative QTc showed a significant positive correlation with both preoperative (r=0.4, p=0.03) and postoperative (r=0.5, p=0.01) coronary flow. In patients with atrial septal defects, QTc postoperatively correlated significantly with the duration of CPB (r=0.6, p=0.04), but not in those with VSD.