Congenital heart disease: predictors of outcome

P2101 | BEDSIDE
Determinants of adverse in-hospital outcome after cardiac surgery in adults with congenital heart disease

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Purpose: Patients with congenital heart disease (CHD) often undergo right-sided surgery and evaluation of the right ventricle (RV) to their cardiac pump function is essential. We aimed to identify determinants of adverse outcome after cardiac surgery. Methods: 503 consecutive adults (56% male, median age 36 years) with CHD operated between January 2001 and January 2011 in the Academic Medical Center in Amsterdam were studied. RV function was considered normal for levels of TAPSE and TDI S’ above 15mm and 11 cm/s respectively. RV failure was defined as combination of (1) elevated jugular venous pressure, (2) impaired RV function on transthoracic echocardiography and (3) diagnosis of RV failure was documented in the medical charts. Intensive care stay was prolonged if it exceeded four days. The composite end point of an adverse in-hospital outcome was operative mortality, RV failure, inotropes on intensive care, and a prolonged intensive care stay, or all. Determinants of adverse outcome were evaluated by logistic regression analysis.

Results: Nine patients (1.8%) died peri-operatively, 19 had RV failure, 83 needed inotropic therapy on intensive care and 21 had prolonged intensive care stay. The composite end point was reached in 91 patients (18.1%). Significant pre-operative determinants of adverse outcome are shown in the Table.

Table 1. Pre operative determinants of adverse outcome after congenital cardiac surgery

<table>
<thead>
<tr>
<th>CR</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supraventricular arrhythmia</td>
<td>4.0</td>
<td>2.3–6.9</td>
</tr>
<tr>
<td>Right-sided congenital heart disease</td>
<td>1.8</td>
<td>1.1–2.8</td>
</tr>
<tr>
<td>Diuretics</td>
<td>3.8</td>
<td>2.0–7.4</td>
</tr>
<tr>
<td>Severe renal impairment</td>
<td>20.7</td>
<td>2.7–200.1</td>
</tr>
<tr>
<td>Moderate or severe RV dysfunction</td>
<td>1.9</td>
<td>1.1–3.4</td>
</tr>
</tbody>
</table>

Conclusion: Supraventricular arrhythmia, renal function and ventricular function were determinants of adverse in-hospital outcome after congenital cardiac surgery.

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Cardiopulmonary exercise testing predicts death and hospitalisation in adult patients with cyanotic congenital heart disease

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Background: Adult patients with cyanotic congenital heart disease (ACHD) are afflicted by increased mortality and morbidity. In contrast to ACHD patients in general, the prognostic value of cardiopulmonary exercise testing (CPX) is less clear.

Methods: We analyzed all CPX performed in cyanotic ACHD patients between 1999 and 2012 at a tertiary ACHD center. Cox proportional-hazards analyses were performed to identify predictors of all cause mortality and hospitalization.

Results: 336 patients were analyzed (46% males, age 34.5±13.8 years). During a median follow up of 4.3 years, 216 patients were hospitalized and 52 died. On multivariable analysis heart rate increase was the only independent predictor of hospitalization (HR 0.88/10 bpm, p=0.0001). Univariable predictors of death were peak VO2 (HR 0.92, p=0.006), anaerobic threshold (HR 0.89, p=0.008), VECVCO2-slope (HR 1.02, p=0.005), resting saturation (HR 0.93, p=0.0001), lowest saturation during exercise (HR 0.97, p=0.003), peak pulse (HR 0.85/10bpm, p=0.0002), and heart rate increase during CPX (HR 0.77/10bpm p=0.0001). On multivariate analysis, peakVO2, resting saturation and heart rate increase were independent predictors of mortality (HR 0.92, 0.95 and 0.83 respectively; p<0.05 for all). ROC analysis identified a peak VO2 of <16.1mL/kg/min, resting saturation <91% and heart rate increase <41bpm as optimal predictive cut-off values. Based on these values, a prognostic score was derived stratifying patients according to risk of death (Fig. 1).

Conclusions: We found evidence of inequitable access to tertiary ACHD care, with patients from lower SES being significantly underrepresented at our center. This alarming as similar survival prospects are realized for deprived and affluent patients once under active ACHD follow-up. Male patients and those living in more deprived areas had a significantly higher incidence of IE. Efforts aimed at improving referral patterns and the quality of dental hygiene/treatment of disadvantaged patients should be increased.

Impact of socioeconomic status and gender on access to healthcare and outcome in adults with congenital heart disease

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Background: Little is known about the impact of Socioeconomic Status (SES) and gender on access to care and outcome in Adults with Congenital Heart Disease (ACHD) followed at large tertiary centers. We hypothesised that patients with lower SES would be underrepresented, would have a higher risk of Infective Endocarditis (IE) and worse survival prospects.

Methods: A total of 5959 ACHD patients (50%-women) under active follow-up at our center were included. The impact of SES on access to tertiary care was estimated using the deprivation index (IMD) for all patients.

Conclusions: We found evidence of inequitable access to tertiary ACHD care, with patients from lower SES being significantly underrepresented at our center. This alarming as similar survival prospects are realized for deprived and affluent patients once under active ACHD follow-up. Male patients and those living in more deprived areas had a significantly higher incidence of IE. Efforts aimed at improving referral patterns and the quality of dental hygiene/treatment of disadvantaged patients should be increased.

Conclusions: Parameters of CPX identify cyanotic patients at risk for hospitalization or death. The current study confirms the predictive value of peak VO2 in the cyanotic population. In addition oxygen saturations and heart rate during exercise were found to be simple yet powerful prognostic markers.

Figure 1