High sensitivity Troponin T in Pediatric patients with Congenital Heart Disease

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Background

High sensitivity troponin T (hsTnT) detects the myocardial injury and predicts poor outcomes in adults with acquired and congenital heart disease (CHD). However, few reports describe the usefulness of hsTnT in pediatric patients (pts) with CHD.

Objectives

The aim of the study was to determine whether hemodynamic load and hypoxia induce the myocardial injury and the hsTnT as a marker of myocardial injury predict the adverse events such as the cardiac arrest, death, or lethal arrhythmia in pediatric pts with CHD.

Methods

Subjects
- Patients <20 years old were analyzed hsTnT from January 2012 to March 2014.
- All pts were divided into 4 groups.
  A: CHD with right sided heart overload (ASD, Ebstein anomaly)
  B: CHD with left sided overload (VSD, PDA)
  C: Cyanotic CHD (TOF)
  D: Others (Cardiomyopathy, myocarditis, cardiac tumor)
- Controls: normal structure heart excluded pulmonary hypertension, Kawasaki disease and arrhythmia.

Methods
- We compared the levels of hsTnT in each groups.
- In A to C groups, we analysed the correlation between the levels of the hsTnT and pulmonary-systemic flow ratio (Qp/Qs), right /left ventricular pressure ratio (RVP/LVP) and SO2.
- Prognostic accuracy was calculated from receiver operating characteristic (ROC) curve

Results

-114 patients (male 54 pts) was enrolled in this study.

Table 1. Baseline characteristics of the study subject

<table>
<thead>
<tr>
<th>A (n=30)</th>
<th>B (n=30)</th>
<th>C (n=24)</th>
<th>D (n=22)</th>
<th>Control (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age(yrs)</td>
<td>Median(range)</td>
<td>3.4</td>
<td>3.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Male (%)</td>
<td>10 (33.3)</td>
<td>11 (36.7)</td>
<td>15 (62.5)</td>
<td>13 (59.1)</td>
</tr>
<tr>
<td>BNP(pg/ml)</td>
<td>Median(range)</td>
<td>18.8</td>
<td>17.8</td>
<td>20.0</td>
</tr>
</tbody>
</table>

- Survival rate was significantly lower in Hs TnT ≥0.02ng/ml group compared to Hs TnT<0.02ng/ml group.

Conclusions

Pressure overload to right ventricle and hypoxia induce the myocardial injury. The high levels of hsTnT may predict poor outcomes in pediatric patients with CHD.