INTRODUCTION

- Acetaminophen (APAP) is a common adjunct for perioperative pain management in children.
- Pediatric APAP pharmacokinetic (pk) data are limited.
- No data to date in children with congenital heart disease following cardio-pulmonary bypass.
- APAP metabolism may be reduced in these children due to depleted endogenous antioxidants and higher levels of oxidative stress.
- Understanding APAP pharmacokinetics following CPB is crucial for effective dosing and analgesia.

OBJECTIVES

- To determine serial postoperative APAP concentrations in children undergoing cyanotic or acyanotic CHD repair.
- To compare pharmacokinetic models between children with cyanotic versus acyanotic CHD.

METHODS & RESULTS

- Prospective study including children between 2 and 6 years of age undergoing surgical palliation or repair of cyanotic (Fontan) or acyanotic (ASD/VSD) pathologies.
- IV APAP (15 mg/kg) was administered at the start of sternal closure.
- Blood samples assayed for APAP concentration at 15, 30, 60, 90, 120, 240, and 360 minutes.
- AVPAP pk were investigated using 1- and 2- compartment models with first order elimination.
- 208 APAP concentrations were analysed from 30 participants.
- A factor for cyanosis on clearance and volume did not result in a significant decrease in OBJ at the 0.05 level (e.g. ΔOBJ < 2.71, p > 0.1).

TABLES & FIGURES

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Total</th>
<th>Cyanotic</th>
<th>Acyanotic</th>
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<tbody>
<tr>
<td>Age (years)</td>
<td>3.59</td>
<td>3.6</td>
<td>3.58</td>
</tr>
<tr>
<td></td>
<td>(2.7, 4.4)</td>
<td>(3.12, 4.1)</td>
<td>(2.53, 4.9)</td>
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<td>Weight (kg)</td>
<td>14</td>
<td>14</td>
<td>14</td>
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<td></td>
<td>(12.9, 17.9)</td>
<td>(13.6, 17.9)</td>
<td>(12.4, 17.6)</td>
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<tr>
<td>Sex (M/F)</td>
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<td>10/5</td>
<td>14/9</td>
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<tr>
<td>Bypass Time</td>
<td>73.5</td>
<td>78</td>
<td>73</td>
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<tr>
<td></td>
<td>(45.2, 88)</td>
<td>(57.5, 92)</td>
<td>(44, 84)</td>
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<tr>
<td>N</td>
<td>30</td>
<td>15</td>
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Table 1: Demographic summary of study participants. Values are presented as median (IQR) or count.

CONCLUSIONS

- First study of APAP pharmacokinetics in children with CHD.
- APAP pharmacokinetics displayed a first-order profile following CPB in children.
- No demonstrable difference in AUC of APAP pharmacokinetics between children with cyanotic or acyanotic CHD.

LIMITATIONS

- No analgesic efficacy data.
- Effect of CPB volume not adjusted.

REFERENCES


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