**INTRODUCTION**
- Non-occlusive mesenteric ischaemia (NOMI) is rare in children.
- The likely mechanism is hypoperfusion/reperfusion injury.
- The outcome tends to be poor.
- Promptness of colonic resection does not seem to improve survival.
- In our institutions we recognised a series of critically ill patients with a similar pattern of colonic injury.

**AIM**
Identify:
1. underlying pathophysiology
2. key learning points
3. patterns in presentation and correlate these with surgical and pathology findings.
4. possible means of improving survival

**METHODOLOGY**
- 2.5 year period (2018-2020)
- 2 institutions providing tertiary paediatric surgery services
- 4 consecutive cases of idiopathic colonic gangrene associated with acute cardiovascular collapse
- Review of clinical notes, histology, radiology, laboratory results

### RESULTS

4 critically ill children

3 had cardiac arrest before colectomy.

All 4 children:
- developed abdominal distension after resuscitation
- had significant derangement of blood sugar on monitoring
- received inotropic support before surgery
- had total colonic ischaemia, and normally ganglionated bowel on histology
- no infective organism was isolated (specifically all negative for clostridium difficile)

#### AIM

#### METHODOLOGY

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<table>
<thead>
<tr>
<th>Case</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>10</td>
<td>14</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>Background</td>
<td>Anxiety Urinary incontinence</td>
<td>Angleman syndrome</td>
<td>Previous hypoglycaemia when unwell</td>
<td>NAD</td>
</tr>
<tr>
<td>Presentation</td>
<td>7 days headache, back pain, 1 vacant episode</td>
<td>2x cardiac arrests Well 24hrs previously</td>
<td>1 week of polyuria and polydipsia then sudden deterioration</td>
<td>2 weeks of cough, thirst, sudden respiratory deterioration</td>
</tr>
<tr>
<td>Deterioration</td>
<td>24hrs</td>
<td>&lt;12hrs</td>
<td>12-24hrs</td>
<td>&lt;12hrs</td>
</tr>
<tr>
<td>Cardiac arrest</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Abdominal distension</td>
<td>Post resuscitation</td>
<td>Post resuscitation</td>
<td>Post resuscitation</td>
<td>Post resuscitation</td>
</tr>
<tr>
<td>DIC</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Post op</td>
</tr>
<tr>
<td>Inotropes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Operative findings</td>
<td>Necrotic colon</td>
<td>Dilated colon</td>
<td>Necrotic colon</td>
<td>Ischaemic colon</td>
</tr>
<tr>
<td>Histology</td>
<td>Ischaemic</td>
<td>Ischaemic</td>
<td>Ischaemic</td>
<td>Ischaemic</td>
</tr>
<tr>
<td>Ganglion cells</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Progression</td>
<td>Multi-organ failure</td>
<td>Multi-organ failure</td>
<td>Cerebellar oedema</td>
<td>Cerebral ischaemia</td>
</tr>
<tr>
<td>Outcome</td>
<td>Death</td>
<td>Death</td>
<td>Death</td>
<td>Death</td>
</tr>
</tbody>
</table>

* DKA - diabetic ketoacidosis

#### CONCLUSION

- No specific condition was identified that predisposed these 4 children to develop NOMI and colonic injury.
- Hypothesis: a working diagnosis of DKA may have led to inadequate fluid resuscitation before inotrope administration – not proven
- Not able to clearly identify means of prevention.
- Despite colonic resection, as part of the resuscitation, outcomes were very poor leading to multi-organ failure and death.

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