Serial Echocardiograms Reveal Occult Coronary Dilation in Patients with Kawasaki Disease

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Background

• Kawasaki disease (KD) is an acute childhood vasculitis that can lead to coronary dilation and aneurysm
• Historically, a dichotomous definition for coronary outcomes has existed to differentiate normal from abnormal
• Recently described intermediate group termed “occult dilation” includes patients with coronary measurements that remain within the normal range based on Z-score, but show reductions in size over time suggesting coronary involvement
• A descriptive study was performed:
  1. to further characterize coronary outcomes in patients with KD when considering those with occult dilation
  2. to examine whether clinical data can predict coronary outcomes

Methods

• Retrospective study on all acute KD patients treated with IVIG at Nationwide Children’s Hospital from October 2012 through November 2016
• Included subjects with serial echocardiograms at diagnosis, 2 wk, 6 wk and 1 yr
• Proximal LAD and RCA were measured with values normalized for BSA
• Patients were divided into the following coronary outcome groups:
  1. Normal = Z-score always < 2 with Z score variation < 2
  2. Occult Dilation = Z-score variation > 2 with absolute Z score always < 2
  3. Definite Dilation = Any Z-score > 2
• Clinical data was analyzed by univariate analysis between each of the coronary outcome groups

Results

• Of the 129 subjects who met inclusion criteria:
  - 62% Normal, 27% Occult Dilation, 11% Definite Dilation
• Pt with occult or definite dilation were more likely to present with prolonged fever ≥10 days (23% and 36%) compared to normal (9%, p-value 0.004)
• Pt with occult or definite dilation were more likely to have IVIG resistance (20% and 36%) compared to normal (10%, p-value 0.01)

Methods (Cont.)

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Conclusions

• KD patients likely have a spectrum of coronary involvement which differs from the previously accepted dichotomous coronary outcomes
• Occult coronary dilation is a common finding in KD patients who have previously been grouped with those who have normal coronary outcomes
• Patients with any coronary dilation, occult or definite, were more likely to present with prolonged fever and IVIG treatment resistance
• Future longitudinal studies are needed to determine the long term outcomes for KD patients with occult coronary dilation

Reference


Figure 1: Coronary artery aneurysms: Echocardiogram showing proximal right coronary artery (RCA) aneurysm (left) and proximal left anterior descending (LAD) and circumflex (LCX) aneurysms

Figure 2: Example coronary artery intraluminal measurements of the proximal right coronary artery (RCA) and proximal left anterior descending (LAD) coronary artery obtained by echocardiography

Figure 3: Mean Z-score trends according to Coronary Outcome Groups

Figure 4: Example coronary artery intraluminal measurements of the proximal right coronary artery (RCA) and proximal left anterior descending (LAD) coronary artery obtained by echocardiography

Table 1: Demographic Data

<table>
<thead>
<tr>
<th>Groups</th>
<th>Normal</th>
<th>Occult Dilation</th>
<th>Definite Dilation</th>
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</thead>
<tbody>
<tr>
<td>Age (mean, SD)</td>
<td>7.5 (3.1)</td>
<td>8.5 (2.9)</td>
<td>8.7 (2.5)</td>
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<td>Sex (male)</td>
<td>52%</td>
<td>52%</td>
<td>53%</td>
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<tr>
<td>Diagnostic confidence</td>
<td>0.29</td>
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<tr>
<td>Z-score variation</td>
<td>2.15</td>
<td>2.15</td>
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<td>Z-score at diagnosis</td>
<td>1.52</td>
<td>1.52</td>
<td>1.52</td>
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</tbody>
</table>
| Coronary Outcome Groups Demographic Data: Medians ± SD and median (IQR)

Figure 3: KD Coronary Outcome Groups Demographic and Clinical Data: Medians ± SD and median (IQR)

Figure 4: Example coronary artery intraluminal measurements of the proximal right coronary artery (RCA) and proximal left anterior descending (LAD) coronary artery obtained by echocardiography