Intrauterine transfusion in severe fetal anemia: Does peak systolic velocity correlate with fetal hemoglobin?

Joohee Lee, Hye-Sung Won, Mi-Young Lee, Jae-Yoon Shim
Department of Obstetrics and Gynecology, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea

Objects

To evaluate the perinatal outcomes of the fetuses with severe anemia who underwent intrauterine transfusion (IUT) and to determine whether a correlation exists between the middle cerebral artery-peak systolic velocity (MCA-PSV) and initial hemoglobin (Hb) level of the fetus before IUT in severe fetal anemia.

This was a retrospective study of 49 fetuses who had received IUT from 2004 to 2018 at our center. Severe fetal anemia was diagnosed by prenatal ultrasound when the MCA PSV was above 1.55 MoM, and was confirmed by cordocentesis, when the Hb was ≤ 0.55 MoM.

Forty-nine fetuses (84%) were diagnosed with severe fetal anemia according to MCA-PSV value. The four main causes of fetal anemia were idiopathic (35%), twin (21%), viral infection (18%), and alloimmunization (14%). In immune fetal anemia, fetal Hb correlated with MCA-PSV in all cases, while the fetuses with non-immune causes did not show correlation. Out of 15 non correlated cases, twin pregnancy was most common, followed by idiopathic causes. Among components of hydrops, ascites was significantly associated with fetal anemia. Also, odds ratio of having ascites in fetuses with high MCA PSV who were confirmed to have severe fetal anemia was 13 (P < 0.1).

Table 1. Correlation of severe fetal anemia with MCA PSV according to immune and non-immune causes

<table>
<thead>
<tr>
<th>Causes of Anemia</th>
<th>Hb &gt; 0.55 MoM</th>
<th>Hb ≤ 0.55 MoM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immune</td>
<td>0 (0%)</td>
<td>7 (100%)</td>
<td>0.084</td>
</tr>
<tr>
<td>Non-immune</td>
<td>15 (35.7%)</td>
<td>27 (64.3%)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1. Of the 49 patients who had over 1.55 MoM of MCA PSV, only 34 were confirmed to have severe fetal anemia

Conclusion

MCA-PSV may not be a reliable single independent factor, especially in non-immune cause of severe fetal anemia. Associated hydrops, especially ascites is a finding that raises reliability of severe fetal anemia, therefore, may be an additional marker for diagnosis.