Early Cord Clamping and Its Effect on some Hematological Determinants of Blood Viscosity in Neonates

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Thirty full term newborns delivered normally through vagina were selected. Umbilical cord clamping was performed within 15 seconds in 15 newborns and after 3 minutes of delivery in the other 15 newborns. Blood samples were taken from placenta at zero time and from neonates at zero, 2 hours, 24 hours and 5 days after delivery.

Abstract

Introduction

Physiologically, the placental circulation is very different from that of a newborn infant. Neonatologically, the process of birth and the circumstances of the delivery of the newborn infant lead to a disturbance of the placental microcirculation which results in a decrease in oxygen and nutrient supply to the placental tissue. More specifically, the placental circulation includes placental vasa praevia, aortic constriction, placental hypoperfusion, and the outflow of blood from the placenta, which are all seen in newborns with different cord clamping modes.

Neonatal blood volume at birth calculated as the difference between an assumed total fetoplacental blood volume of approximately 115ml/kg of neonatal body weight and the fetal blood volume of the placenta. The fetal blood volume of the placenta i.e. the residual placental blood volume in placenta after umbilical cord clamping was calculated by subtracting cord blood volume from the placental blood volume. The volume of cord blood removed before homogenization of the placenta was added to the fetal blood volume of the placenta.

Results

Analysis of variance for paired observations was used to test for changes in the measured parameters during the first 5 days of life. Differences between the two groups (early vs late cord clamping) and the one old infants were compared using analysis of variance for unpaired observations.

Statistical Analysis

Since the fetal-placental blood volume is approximately 115 ml/kg of neonatal body weight (9), neonatal blood volume was estimated as the difference between 115ml/kg and the fetal blood volume of the placenta.

Discussion

Fetal blood volume of the placenta was also determined. The results were compared with 10 healthy infants (10 months age). The rapid 50% increase in blood volume as a result of late cord clamping is counteracted by extravasation of plasma, so that the newborn baby will have an increased plasma viscosity, strong red cell aggregation and decreased red blood cell deformity. The relative viscosity is calculated as ratio of blood to plasma viscosity.

The relative viscosity is calculated as the ratio of blood to plasma viscosity. The increase in blood viscosity is proportional to the rate of RBC aggregation. The increase in transmission of infrared light during 10s of blood stasis is proportional to the rate of RBC aggregation. The increase in transmission of infrared light during 10s of blood stasis is proportional to the rate of RBC aggregation.

Conclusion

Early cord clamping results in increased plasma viscosity, strong red cell aggregation and decreased red blood cell deformity. These changes are statistically significant. The results suggest that early cord clamping should be avoided if possible and that in the absence of evidence to the contrary, routine cord clamping should not be delayed.
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Abstract: The goal of the study was to determine the effect of early cord clamping on hematocrit, plasma proteins, and fibrinogen in infants at 10±2 months of age. The results showed that early cord clamping resulted in a lower hematocrit and higher plasma protein concentration compared to late cord clamping. The difference in hematocrit was statistically significant (p<0.05). However, the difference in plasma protein concentration was not statistically significant (p>0.05).

Methods:

We used the hematocrit, plasma proteins, albumin, and fibrinogen concentrations to determine the effect of early cord clamping on blood viscosity in infants at 10±2 months of age. Hematocrit, plasma proteins, and fibrinogen concentrations were measured in the first five days of life. The results showed that early cord clamping resulted in a lower hematocrit and higher plasma protein concentration compared to late cord clamping. The difference in hematocrit was statistically significant (p<0.05). However, the difference in plasma protein concentration was not statistically significant (p>0.05).

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Table 1: Hematocrit, plasma proteins, albumin, and fibrinogen in the studied groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Hematocrit</th>
<th>Plasma protein (g/l)</th>
<th>Albumin (g/l)</th>
<th>Fibrinogen (g/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>0.47±0.05</td>
<td>0.41±0.04</td>
<td>2.8±0.2</td>
<td>2.7±0.3</td>
</tr>
<tr>
<td>Late</td>
<td>0.59±0.05</td>
<td>0.41±0.07</td>
<td>2.8±0.4</td>
<td>2.7±0.3</td>
</tr>
</tbody>
</table>

Table 2: Plasmap, fibrinogen, and fibrinogen in the studied groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Plasmap (g/l)</th>
<th>Fibrinogen (g/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>0.47±0.05</td>
<td>2.7±0.3</td>
</tr>
<tr>
<td>Late</td>
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http://www.obgyn.net/pb/articles/cordclamping_aziz_0699.htm