Interpretation of Cord Serum Thyroid Hormones

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SUMMARY
Thyroid function was investigated in fetal cord blood samples obtained at birth. Women who had uncomplicated pregnancies and delivery were selected. Vaginally delivered (VD) babies and higher thyroid-stimulating hormone (TSH) mean levels than babies delivered by cesarean section (CS); these findings were statistically significant. Thyroxine (T4) and triiodothyronine (T3) mean levels in both types of delivery were similar. These results of this exploratory study suggest that the route of delivery should be taken into consideration in the interpretation of cord blood thyroid hormone levels.

Keywords: Cesarean section, Vaginal delivery, Thyroid functions


ÖZET
Doğumda elde edilen fetal kord kanında tiroid fonksiyonları araştırıldı. Gebeliği esnasında ve doğumda komplikasyon olmayan kadınlardan araştırma için seçildi. İstatistiksel olarak vaginal doğan (VD) bebeklerin sezaryen (CS) doğanlardan daha yüksek tiroid stimulan hormon (TSH) ortalaması düzeyine sahip olduklarını belirgin olarak ortaya çıkmıştır. Bu çalışmanın sonuçları kord kanında tiroid hormon düzeylerinin yorumlanmasında doğum şekline dikkat edilmesi gerektiğini göstermektedir.

Anahtar Kelermerler: Sezaryen, Vaginal doğum, Tiroid fonksiyonları

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Thyroid hormone levels of the cord blood routinely measured in many hospital as the screening test for congenital hypothyroidism (1,2). We wondered whether the stress of labour and delivery associates with changes in the concentrations of T4, T3 and TSH or not. Therefore, we investigated the umbilical cord plasma T4, T3, and TSH levels during VD and CS.

MATERIALS AND METHODS
Umbilical cord blood was obtained at second stage of delivery from 37 women. They had uncomplicated singleton pregnancies and delivered at term. No complications were observed in the newborns, either. Seventeen of the babies were born by elective CS and 20 of the babies had a normal spontaneous VD. The collected blood was centrifuged, and the serum was then frozen -20°C until analyzed. Amerlex-M (Amerlite Diagnostic Ltd, Buckinhamshire, England) radioimmunoassay kits were used to measure T3, T4 and TSH concentrations. Students t-test was used for statistical analysis.

RESULTS
Maternal age, gravidity, parity, and birthweight means of VD and CS groups are shown in Table 1. There was no statistically significant difference between them (p>0.05).

The mean T3, T4, and TSH concentrations of CS and VD groups are shown in Table 2. There was no statistically significant difference between the mean T4 and T3 levels of two groups (p>0.05). There was a significant difference in the TSH concentrations between CS and VD groups. The mean TSH concentration of VD group was statistically higher than in CS group (p<0.05).

DISCUSSION
Fetal thyroid function is independent of maternal thyroid status. At 18-22 weeks of gestation an abrupt
Table 1. Statistical comparison of maternal age, gravida, parity, and birthweight in VD and CS groups

<table>
<thead>
<tr>
<th></th>
<th>VD Group (n:20)</th>
<th>CS Group (n:17)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (year)</td>
<td>25.25 ± 1.03</td>
<td>27.29 ± 0.88</td>
<td>0.77</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Gravida</td>
<td>2.50 ± 0.29</td>
<td>2.59 ± 0.29</td>
<td>0.21</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Parity</td>
<td>1.35 ± 0.20</td>
<td>1.47 ± 0.37</td>
<td>0.29</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>Birthweight (g)</td>
<td>3494.50± 95.16</td>
<td>3458.23± 22.94</td>
<td>0.41</td>
<td>&gt;0.05</td>
</tr>
</tbody>
</table>

Table 2. Umbilical cord plasma T3, T4 and TSH concentrations, and mode of delivery

<table>
<thead>
<tr>
<th></th>
<th>VD Group (n:20)</th>
<th>CS Group (n:17)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>T3 (ng/dl)</td>
<td>37.93 ± 2.95</td>
<td>34.2 ± 4.33</td>
<td>0.71</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>T4 (ug/dl)</td>
<td>10.35 ± 0.97</td>
<td>9.06 ± 0.74</td>
<td>1.05</td>
<td>&gt;0.05</td>
</tr>
<tr>
<td>TSH (mIU/ml)</td>
<td>7.53 ± 1.09</td>
<td>2.33 ± 50</td>
<td>4.56</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

In conclusion, route of delivery is significantly associated with cord blood TSH concentration. In any manner when cord blood sampling is done, a high false positive rate may be found if the route of delivery is not taken into account. In addition, the other factors effecting T3, T4, and TSH levels should be taken into consideration in the evaluation of newborn thyroid disfunctions.

REFERENCES