

Interpretation of Cord Serum Thyroid Hormones

KORD SERUM TIROID HORMONLARININ YORUMLANMASI

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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

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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 T₃, T₄ and TSH or not. Therefore, we investigated the umbilical cord plasma T₃, T₄, 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 than frozen -20°C until analyzed. Amerlex-M (Amerlite

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248

ÖZET

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

Anahtar Kelimeler: Sezaryen, Vaginal doğum, Tiroid fonksiyonları

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Diagnostic Ltd, Buckinghamshire, 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 T₃, and T₄ 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

T Klin Jineköl Obst 1992, 2

Table 1. Statistical comparison of maternal age, gravida, parity, and birthweight In VD and CS groups

	VD Group (n:20)	CS Group (n:17)	t	p
Age (year)	25.25 ±1.03	27.29 ± 0.88	0.77	>0.05
Gravida	2.50 ±0.29	2.59 ± 0.29	0.21	>0.05
Parity	1.35 ± 0.20	1.47 ± 0.37	0.29	>0.05
Birthweight (g)	3494.50 as 95.16	3458.238e 22.94	0.41	>0.05

Table2. Umbilical cord plasma **T3**, **T4** and TSH concentrations, and mode of delivery

	VD Group (n:20)	CS Group (n:17)	t	p
T ₃ (ng/dl)	37.93 ± 2.95	34.2 ±4.33	0.71	>0.05
T4 (ug/dl)	10.35 ±0.97	9.06 ±0.74	1.05	>0.05
TSH (mIU/ml)	7.53 ± 1.09	2.33 ±50	4.56	<0.05

increase in TSH concentration occurs and this level continues up to maturity. Therefore, TSH concentrations between preterm and term infants do not differ (3,4).

In our study, maternal age, gravidity, parity, and birthweight means were statistically not different in VD and CS groups. The mean TSH concentration of the VD group was statistically higher than CS group (p<0.05). Lao reported similar results in his investigation (2). The results suggests that the route of delivery is associated with different levels of the TSH concentrations. Hypothalamic-pituitary-thyroid axis probably response to the mode of delivery.

Other factors which can increase TSH concentration are; perinatal asphyxia, instrumental delivery, delivery of fetus small for gestational age, antibodies interfering with the assay or heterophilic antibodies, and preeclampsia (3,5,6,7,8,9)

Our results demonstrate that **T3** and **T4** concentrations are similar in VD and CS groups. These results are In parallel with Lao's report (2). Preeclampsia and small for gestational age fetus can increase fetal **T4** concentration, but **T3** concentration level remains unchanged (6,8).

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 dis-functions.

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