

Breastfeeding Relationship Between Prolactin, Thyroid Stimulating Hormon Levels and Mode of Delivery

Prolaktin, Troid Stimulan Hormon ve Doğum Şeklinin Emzirme İle İlişkisi

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Abstract

Introduction: The aim of this study was to compare Prolactine (PRL) and Thyroid stimulating hormone (TSH) levels, known to be important in lactation, at two hours postpartum between patients delivering vaginally and by cesarean operation.

Material and Methods: A total of 162 patients delivering vaginally and by cesarean section were included in the present study. PRL and TSH values in the second hour postpartum were recorded and evaluated with the Mann–Whitney U test, Kruskal–Wallis test, and NPar test. In addition, the relationships between PRL and TSH hormone levels and the type of anesthesia administered during cesarean operation, Body mass index (BMI), income status, smoking history, age of mother, use of oxytocin in labor, weight of the infant, and sex of the infant were evaluated.

Results: Of the 162 patients, 118 were delivered vaginally and 44 by cesarean section. Prolactin levels were significantly higher in cesarean section group when compared with normal vaginal delivery group ($p=0.016$). However, no significant difference was observed between two groups in terms of TSH levels ($p=0.439$). Similarly, no differences in PRL and TSH values were found between general anesthesia and spinal anesthesia groups. It was also established that other parameters did not affect hormone levels.

Conclusions: Prolactin level, which is an important hormone during lactation, is found to be higher after cesarean section. This finding does not support the idea that lactation is diminished due to cesarean section. Negative impacts on lactation after cesarean section depend not on hormonal alterations related to mode of delivery, but on factors that can be modified through training and insight.

Key words: Hormone, Prolactin, Breastfeeding, Obstetric delivery, Cesarean section.

Özet

Amaç: Normal doğum ve sezeryanla doğum yapan hastalarda emzirmede önemli olduğu bilinen PRL ve TSH düzeylerinin postpartum 2. saatteki değerlerinin karşılaştırılması.

Materyal ve Metod: Sezeryan veya normal vajinal doğum yapmış postpartum 2. saatinde toplam 162 hasta çalışmamıza dahil edildi. Hastaların postpartum 2. saatindeki kan PRL ve TSH değerleri kaydedildi. Veriler Wann Whitney U test, Kruskal-Wallis test, NPar Testlerle değerlendirildi. Ayrıca sezeryanda anestezi tipi, BMI, gelir durumu, sigara, anne yaşı, travayda oksitosin kullanımı, bebek cinsiyeti ve bebek ağırlığının PRL ve TSH hormonlarıyla ilişkisi değerlendirildi.

Bulgular: 162 hastanın 118'i normal vajinal doğum ve 44'ü sezeryan ile doğum yapmıştı. 2 grup karşılaştırıldığında PRL P:0,016 değeri ile sezaryen grubunda normal doğum grubuna göre istatistiksel olarak anlamlı yüksek tespit edildi. TSH için P değeri:0,439 ile iki grup arasında fark izlenmedi. Genel anestezi ve spinal anestezi grubunda PRL ve TSH değerlerinde anlamlı fark bulunmadı. Diğer parametrelerinde hormon düzeylerini etkilemediği tespit edildi.

Sonuç: Laktasyonda önemli olduğu bilinen prolaktin düzeyleri sezaryenden sonra anlamlı yüksek bulundu. Bu sonuç sezaryen ile doğumun laktasyonu olumsuz etkilediği görüşünü desteklemektedir. Sezeryan ile doğumdan sonra laktasyonun negatif etkilenmesi doğum şekline bağlı hormonal değişikliklere değil, eğitimle değiştirilebilen faktörlere bağlıdır.

Anahtar Kelimeler: Hormon, Prolaktin, Beslenme, Dogum, Sezeryan

Backgrounds

Without a doubt, breastfeeding is critical for the nutrition and well-being of the newborn; therefore, it is recommended as the main route of nutrition. There are many factors that influence breastfeeding, such as frequency, skin contact, attitudes to and information about it, social class, and duration of the act. However, many mothers experience problems regarding lactation, among which are postoperative pain and obstetrical analgesia (1-7). In many publications, it has been shown that the lactation of mothers is adequate to feed their infants. Nevertheless, it is also known that coanxiety in mothers regarding breastfeeding and their stress lead to early weaning (8-10).

Lactation performance depends not only on psychological and stress factors, but also on the physical stress of delivery and labor (11-14). There has been a marked rise in the rate of cesarean

deliveries in the western hemisphere within the last three decades (11,15), and some studies have suggested that cesarean section has an adverse effect on lactogenesis (11,16-18). However, the data on the relationship between cesarean delivery and long-term lactation performance has been found to be conflicting (11,19-21). In cesarean delivery, there is less physical stress prior to birth than in vaginal delivery; however, it is thought that the delay in communication between mother and infant after cesarean delivery influences lactation adversely (11,22). Moreover, lactation is initiated later in cesarean delivery than in vaginal delivery (8, 23), and late onset of first breastfeeding contributes to the perception that the milk is insufficient (8,24). In the study by Baxter (2006), it was demonstrated that sufficient care after cesarean is important for lactation (8,24).

Based upon the aforementioned literature findings,

the present study was planned with the aim of comparing PRL and TSH levels, which are known to be important in lactation, in the second hour postpartum between patients delivering vaginally and by cesarean section. In addition, the relationships between blood and TSH levels and smoking history, BMI, number of pregnancies, age of the mother, duration of lactation in previous pregnancies, use of induction in delivery, vitamin use during pregnancy, infant weight, type of anesthesia administered in cesarean operation, sex of the infant, family history of diabetes, and social and income status were evaluated.

Materials and Methods

Included in the study were 162 patients referred to the obstetrics unit of Ankara Keçiören Training and Investigation Hospital between January 2012 and September 2012. All the patients delivered at term, and their parity, age, BMI (weight and height), risky pregnancies, comorbid diseases, vitamin use during pregnancy, and income status were recorded. The patients were monitored during labor and after delivery, and their mode of delivery, use of induction, type of anesthesia administered in those undergoing cesarean, and infant weight were also recorded. At the second hour postpartum, blood prolactin and TSH values were examined using a Liaison hormone analyzer. The data were transferred to a computer SPSS program and evaluated with the Mann–Whitney U test, Kruskal–Wallis test, and NPar test. Mean \pm standard deviation and p values of PRL and TSH levels are shown in Table 1.

Results

Prolactin levels were significantly higher in cesarean section group when compared with normal vaginal delivery group ($p=0.016$). However, no significant difference was observed

between two groups in terms of TSH levels ($p=0.439$). In addition, in the patients undergoing cesarean, no significant differences in TSH and PRL values were found between patients administered general anesthesia and those administered spinal anesthesia ($p=0.087$ and $p=0.808$, respectively).

No statistically significant relationships were found between PRL and TSH hormone levels and BMI, smoking history, week of pregnancy at delivery, age, income status, use of induction during labor, sex of the infant, or weight of the infant.

Discussion

In previous studies, it was established that lactation performance depends on the stress of labor and delivery; accordingly, cortisol and prolactin levels were evaluated in patients undergoing elective cesarean delivery and delivering vaginally. In many reports, it has been stated that elective cesarean has more adverse effects on lactation than does vaginal delivery. Stress factors (operation anxiety of the mother when undergoing cesarean) are considered to be important in this finding (11-14,16-18,22). In addition, pain after cesarean and anxiety might also have a negative impact on lactation, as postpartum pain and anxiety are quite lower in vaginal delivery than in cesarean delivery (11). In a previous study, anxiety levels were found to be higher in primiparous women, which was found to be consistent with impaired lactation (25). It also has been found that prolactin level has a significant effect on early lactation (11). In the present study, postpartum second hour prolactin levels were found to be significantly higher in the cesarean section group which suggests that lower lactation performance after cesarean section is not related with postpartum prolactin levels.

Some studies have suggested that lactogenesis occurs independently of hormones (26-28). Although it has

been shown in some previous studies that mothers produce enough milk for their infants, there is a perception that milk production is higher in mothers delivering vaginally than in those undergoing elective cesarean operations (8). Epinephrine release increases, due to psychological prejudiced perceptions and postoperative pain and hunger in postpartum mothers, which inhibits the release of oxytocin. As a consequence, milk production is inhibited, which inhibits nipple engorgement, in turn delaying the onset of lactation. (3) Thus, women think they do not produce enough milk, and they enter a vicious cycle. If the patients who had undergone cesarean section are informed that higher prolactin levels were detected after the operation, it will become easier for the mothers to break the vicious cycle. Baxter stressed in 2006 that lactation care behavior is important in lactation (24). In addition, in the present study, no significant difference in second hour postpartum prolactin values was seen between patients administered spinal anesthesia and those administered general anesthesia. In previous studies, it was observed that the use of epidural anesthesia in vaginal delivery had an adverse effect on lactation (29). This is due to the fact that epidural anesthesia prolongs the duration of vaginal delivery and decreases endogenous oxytocin release, impairing spontaneous lactation after delivery; our patients who delivered vaginally were not administered epidural anesthesia. In the cesarean group, no statistically significant differences in prolactin and TSH values were found between patients administered spinal anesthesia and those administered epidural anesthesia, which indicates that the type of anesthesia does not play an important part in

lactation. (3). In another study, it was demonstrated that lactation was better with spinal anesthesia than with epidural PCA, but no statistically significant differences were found among the other three groups (spinal and pethidine combined, spinal epidural combined, and intravenous PCA) in this regard (8). However, although there are no differences in hormone levels, the positive effect of spinal anesthesia on postpartum early contact between mother and infant should not be disregarded. In addition, it was found that systemic maternal obesity and weight (high BMI) has an unfavorable effect on the initiation and maintenance of lactation (30). It is thought that this may be related to the low prolactin response of obese women to lactation. As is known, lactation does not start if progesterone levels do not drop. However, progesterone is stored excessively in obese women, due to the high amount of fat tissue. Hence, the drop in progesterone is delayed in obese women, who exhibit a lower release of prolactin in the first week postpartum. In addition, the body provides maximum response in the first 30 minutes after the onset of suckling. Lactogenesis is delayed in overweight women due to this factor (31). In the present study, no statistically significant relationship was found between BMI and second hour postpartum TSH and PRL values. These findings suggest that prolactin level is not very important in lactation performance in the two groups, and that other factors influencing lactation are more predominant. In the present study, it was demonstrated that smoking history, BMI, number of parity, weight gained during pregnancy, age of the mother, social status, number of pregnancies, duration of lactation in previous pregnancies, use of induction in labor, use of vitamins during pregnancy, infant weight, type of anesthesia administered in cesarean operation, sex of the infant, family history of diabetes, and income

status had no significant effects on second hour postpartum PRL levels.

CONCLUSIONS

In conclusion, lower lactational performance despite higher prolactin levels in the cesarean section group indicates that in the early lactation period, the anxiety level of the mother, rather than hormone levels, is important in lactogenesis. To decrease stress factors, the patients should be assured that mode of delivery, weight, income status, and method of anesthesia play no important roles in lactation; if necessary, psychological support should be provided. In addition, to assist with lactation in mothers who deliver by cesarean operation, prejudices about lactation should be eliminated and mother–baby contact and communication should start early (32), infants should be breastfeed frequently, and postpartum pain should be relieved. In addition, the father should display understanding and encourage the mother (33). Pregnant women should be informed about these facts, and they should be encouraged and trained for lactation. Training should start early in the pregnancy, and the false expectation of failure of lactation due to cesarean operation should be removed from their minds. Thus, the Surgeon General's health goals for 2010, that 75% of mothers should start breastfeeding and 50% should continue doing so for six months, will be reached (30).

Competing interests: The author(s) declare that they have no competing interests.

Each author's contributions to the manuscript:

Rahime Bedir Findik: Collection and assembly of data, writing the article, critical revision of the article, research concept and design.

Busra Demir Cendek: Final approval of the

article

Sebnem Sen Ozyer: Final approval of the article

Nuray Vuran: Data analysis and interpretation

Tulay Ogan: Data analysis and interpretation-

Collection and assembly of data

Jale Karakaya: Stastical analysis

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Table 1 : Relationship Between Mode of Delivery, Prolactin –Thyroid Stimulating Hormon Levels

| | | PRL | TSH | P value (PRL) | P value (TSH) |
|------------------------------------|-------------------|------------|-------------|---------------|---------------|
| Mode of delivery | VD | 156 ± 48 | 2,05 ± 1,3 | 0,016 | 0,439 |
| | C/S | 177 ± 39 | 1,8 ± 0,8 | | |
| Type of anesthesia in the cesarean | GA | 179 ± 37 | 1,84 ± 0,8 | 0,871 | 0,808 |
| | SA | 177 ± 40 | 1,8 ± 0,8 | | |
| Body mass index(BMI) | <26 | 165 ± 40 | 1,84 ± 0,7 | 0,135 | 0,135 |
| | 26-30 | 176 ± 40 | 2,08 ± 1,04 | | |
| | ≥30 | 184 ± 38 | 1,54 ± 0,7 | | |
| Income status | Good | 146 ± 56 | 1,56 ± 0,8 | 0,218 | 0,605 |
| | Moderate and poor | 182 ± 34 | 1,83 ± 0,8 | | |
| Smoking | + | 200 ± 4,7 | 1,67 ± 0,9 | 0,123 | 0,747 |
| | - | 174 ± 40,8 | 1,81 ± 0,8 | | |
| Mother's age | <30 | 179 ± 38 | 1,88 ± 0,9 | 0,692 | 0,335 |
| | ≥30 | 173 ± 42 | 1,59 ± 0,7 | | |
| Oxytocin use during labor | No | 176 ± 40,6 | 1,80 ± 0,85 | 0,984 | 1 |
| | Yes | 188 ± 40,6 | 1,78 ± 1,05 | | |
| Baby gender | Male | 174 ± 43 | 1,9 ± 0,88 | 0,895 | 0,078 |
| | Female | 184 ± 26 | 1,49 ± 0,75 | | |
| Baby weight | <3500 | 179,2 ± 37 | 1,75 ± 0,86 | 0,349 | 0,495 |
| | ≥3500 | 173,2 ± 45 | 1,9 ± 0,88 | | |

VD:Vaginal delivery, C/S: Cesarean section, GA: General anesthesia, SA: Spinal anesthesia, TSH: Triode stimulating hormone, PRL: Prolactine hormone

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