ISSN 1300-5251

PERINATAL JOURNAL

Volume **14** / Issue **2** / **2006**

The Official Publication of Turkish Perinatology Society

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ISSN 1300-5251

PERINATAL JOURNAL

Volume 14 / Issue 2 / 2006

The Official Publication of Turkish Perinatology Society

On behalf of the Turkish Perinatology Society: Murat Yayla

Managing Editor: Cihat Şen

www.perinataljournal.com

Published three times a year • Publication local periodical

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— ***Book:*** Jones KL. Practical perinatology. New York: Springer; 1990. p. 112-9.

— ***Chapter in a book:*** Sibai BM, Frangieh AY. Eclampsia. In: Gleicher N, editors. Principles and practice of medical therapy in pregnancy. 3rd ed. New York: Appleton&Lange; 1998. p. 1022-7.

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Perinatal Journal

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Contents

Comparison of the Effect of Single and Repeated Courses of Corticosteroids on Fetal Lung Maturation and Brain Growth in Pregnant Rats

Ayşe Kafkaslı[1], Yaprak Engin-Üstün[1], Mehmet Boz[1], Neşe Karadağ[2]

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Abstract

Objective: To compare the effect of single and repeated courses of corticosteroids on fetal lung maturation, birth weight, head circumference and brain growth in fetal rats.

Methods: Forty two Sprague-Dawley rats were divided into 6 groups. Mature and premature pregnant rats were given intramuscular betamethasone (0.5 mg/kg) at 16 or at 16-18 days of gestation. Controls (mature and premature rats) received equivalent volumes of sterile normal saline. Rats were delivered at 19 (preterm) and 22 (term) days. After cesarean delivery, we measured birth weight, length, head circumference, weight of whole brain, maximal cerebral anterior-posterior length and evaluated the lungs histopathologically.

Results: There were no significant differences in birth weight and whole brain weights between the premature rats receiving one dose and repeated doses of corticosteroid. Lung maturation in premature rats revealed 71.4% glandular stage in the rats receiving one dose of corticosteroid where as 42.9% glandular stage and 42.9% canalicular stage in rats receiving multiple courses.

Conclusion: Administration of repeated courses of corticosteroids did not cause any significant differences in birth and brain weights, but increased maturation in lungs in comparison with one dose.

Keywords: Corticosteroids, fetal lung maturation, brain growth.

Gebe rat fetüslerinde tek ve tekrarlanan doz kortikosteroid kullanımının akciğer matürasyonu ve beyin gelişimi üzerine etkileri

Amaç: Tek ve tekrarlanan doz kortikosteroidlerin fetal akciğer matürasyonu, doğum ağırlığı, baş çevresi ve beyin gelişimi üzerine olan etkilerinin karşılaştırılması.

Yöntem: Kırk-iki tane Sprague-Dawley cinsi rat 6 gruba ayrıldı. Gebe ratlara gebeliğin 16, 17 ve 18. günlerinde intramuskuler betametason (0.5mg/kg) ve kontrol grubuna da salin solüsyonu verildi. Ratlar 19. gün (preterm) ve 22. gün (term) olarak doğurtuldu. Sezeryanla doğumu takiben doğum ağırlıkları, boy uzunlukları, baş çevreleri, tüm beyin ağırlıkları, tüm beyin en uzun ön-arka çapı ve beyin genişliklerinin ölçümü yapıldı. Histopatolojik olarak akciğer matürasyonu değerlendirildi.

Bulgular: Preterm kontrol grubu, tek doz kortikosteroid alan grup ve tekrarlanan doz kortikosteroid alan gruplar arasında doğum kilosu, boy uzunluğu, baş çevresi ve tüm beyin ağırlığı açısından anlamlı fark bulunmadı ($p > 0.05$). Pretermlerde histopatolojik olarak tek doz kortikosteroid verilen grupta akciğer matürasyon evresi %71.4 glandüler evre, %28.6 glandüler-kanaliküler evre, tekrarlanan doz kortikosteroid alan grupta %42.9 glandüler evre, %42.9 kanaliküler evre olarak bulundu.

Sonuç: Gebe ratlarda tekrarlanan dozlarda kortikosteroid kullanımı fetal doğum ve beyin ağırlığında tek doza göre farklılık yaratmamakta ancak akciğer matürasyonunda ilerlemeye yol açmaktadır.

Anahtar Sözcükler: Kortikosteroid, fetal akciğer matürasyonu, beyin gelişimi.

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Introduction

It is known that antenatal corticosteroid usage in preterm births causes decrease in the rates of neonatal death, respiratory distress syndrome, intraventricular hemorrhage and necrotizing enterocolitis.[1] It is showed that multiple dose of antenatal corticosteroids is related with decrease in neurons' count and degeneration of neurons in hippocampus.[2] Quinlivan et al reported that there is a significant decrease in those who were given repeated dose of corticosteroid as to control group in terms of body and organ weights, therm and preterm biometric measurements (weight, femur length, brain volume, brain weight).[3]

The purpose of this study is to determine the effect of corticosteroids on brain tissue and to compare effects of single dose and repeated dose of corticosteroids on lung maturation of premature and mature rats.

Methods

40 female Sprague-Dawley rats (250-275 g) and 15 male Sprague-Dawley rats were used as subject in this work. Rats were bred. Gestation was established by formation of solid, yellow vaginal plate. Appearance of vaginal plate was deemed as the first day of gestation. Newborns were used in the work. Rats were supplied from Experimental Animal Research Center of Medical Faculty of Dicle University. Rats used in the work were not used in any experiment before. Consent of ethic board was taken before starting the work. Rats were taken care in special cages having ventilation for 25 days and enough sunlight. Each rat was put into different cage to not have any problem with given drug doses and to prevent possible infection risk which might appear during experiment. All rats in cages were fed with pellet feed including low sodium. First 42 newborns of rats were included into the work. 6 working groups were formed:

Group 1: Premature control group which were applied no treatment, pregnant rats being applied antenatal saline betamethasone (n=7).

Group 2: Premature pregnant rats which had single dose of antenatal betamethasone (n=7).

Group 3: Premature pregnant rats which had three repeated doses of betamethasone (n=7).

Group 4: Mature control group which were applied no treatment, pregnant rats being applied antenatal saline betamethasone (n=7).

Group 5: Mature pregnant rats which had single dose of antenatal betamethasone (n=7).

Group 6: Mature pregnant rats which had three repeated doses of betamethasone (n=7).

All six groups were applied preterm cesarean birth by taking into consideration that gestation period of all pregnant rats were 21 days.

Before preterm cesarean birth, 0.5 mg/kg intramuscular saline solution was applied to Group 1; 0.5 mg/kg intramuscular betamethasone (Celestone Chronodose ampule, Eczacibasi Ilac Sanayi ve Ticaret A.S., Istanbul with the license of Schering-Plough Corporation) was applied to Group2; three doses of 0.5 mg/kg intramuscular betamethasone was applied to Group 3. Single dose of intramuscular saline solution was applied to Group 4; single dose of intramuscular and 0.5 mg/kg betamethasone were applied to Group 5; three doses of intramuscular and 0.5 mg/kg betamethasone were applied to Group 6. Drug applications were done on the 16th gestational day for group being applied single dose and on 16th, 17th and 18th gestational days for groups being applied repeated doses. The operation was done in 19th gestational day for premature groups and in 21st gestational day for mature groups. Vaginal plate formation was deemed as the first day of gestation for determination of gestation days and gestational days were found by counting next days for each rat. Alive young rats of each rat and their birth weight were determined. Tissues to be examined were removed in appropriate conditions after applying 50 mg/kg ketamine – hydrochloride and 5 mg/kg xylazine as anesthesia. They were fixed within formalin and taken into histopathologic examination. Histology expert was provided not to know which tissue was from which group.

In lung maturation of rat fetuses, pseudoglandular phase should be completed at 18th gestational day, canalicular phase should be completed at 19th-20th gestational day and saccular phase should be completed at 21st gestational day. For histopathologic determination of lung maturation, glandular phase, canalicular phase and saccular phase were used in determination as growth phases and glandular-canalicular phase and canalicular-saccular phase were used in determination as intermediate phases.

While evaluating findings obtained from the work, SPSS Windows 10.0 program was used for statistical analyzes and Post Hoc Multiple

Comparison, Mann Whitney-U and Kruskal-Wallis analyzes were used for statistical analysis method. Results were evaluated in the level of $p<0.005$ as statistical significance limit.

Results

In the determination of lung maturation phases, 19% of all subjects were found as glandular phase (Figure 1), 23.8% of them were found as glandular-canalicular phase, 42.9% of them were found as canalicular phase (Figure 2), 7.1% of them were found as canalicular-saccular phase and 7.1% of them were found as saccular phase (Figure 3). 85.7% of subjects which were applied single dose of betamethasone in mature group were found as canalicular phase and 14.3% of them were found as canalicular-saccular phase; 14.3% of subjects which were applied repeated dose of betamethasone were found as glandular-canalicular phase and 85.7% of them were found as canalicular phase; 14.3% of subjects which were applied saline solution were found as glandular-canalicular phase, 14.3% of them were found as canalicular phase, 28.6% of them were found as canalicular-saccular phase and 42.9% of them were found as saccular phase. 71.4% of subjects which were applied single dose of betamethasone in premature group were found as glandular phase and 28.6% of them were found as glandular-canalicular phase; 42.9% of subjects which were applied repeated dose of betamethasone were found as glandular phase and 14.3% of them were found as glandular-canalicular phase, 42.9% of them were found as canalicular phase; 71.4% of subjects which were applied saline solution were found as glandular-canalicular phase and 28.6% of them were found as canalicular phase.

No significant difference was found between groups which took single dose of betamethasone (101.14±32.48 mg), repeated dose of betamethasone (117.28±51.21 mg) and saline solution (171.28±53.61 mg) in terms of weight of whole brain in premature rat groups ($p>0.005$). A significant difference was found between both groups which took saline solution (335.00±117.08 mg) and single (228.14±45.52) and repeated dose of betamethasone (195.42±61.65 mg) in groups of mature rats ($p<0.005$). No significant difference was found between groups having single and repeated doses of betamethasone ($p=0.36$) (Diagram 1) (Figures 4 and 5).

Birth weight, head circumference, brain length and brain width information of premature and mature rat groups were given in Table 1 for repeated dose of corticosteroid and in Table 2 for single dose of corticosteroid.

Discussion

There are potential dangers of repeated dose of antenatal corticosteroid usage.[1,4] These are: 1.Glucose tolerance disorder 2. Osteolysis 3. Adrenal suppression 4. Dysplasia 6.Myelinization anomaly. American Collage of Obstetricians and Gynecologist (ACOG) suggests that it is suitable to give betamethasone or dexamethasone to preterms

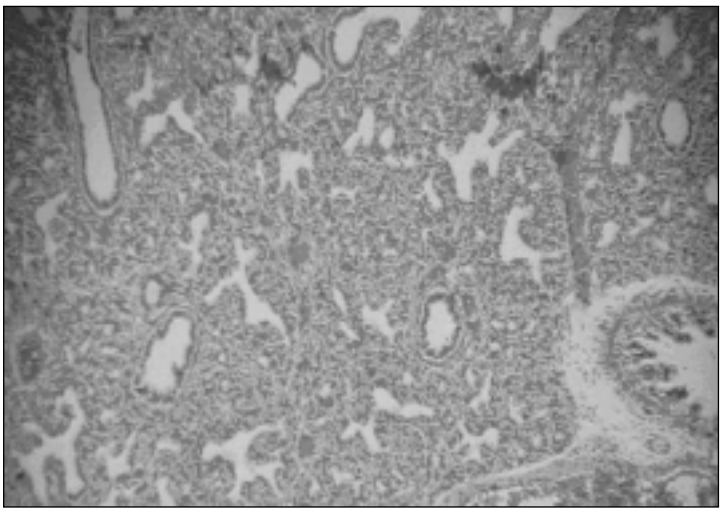

Figure 1. Glandular phase of lung maturation (H&E x 100).

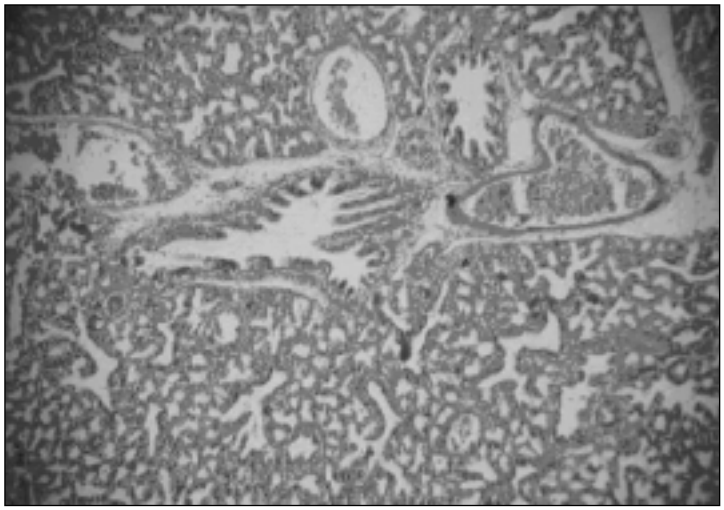

Figure 2. Canalicular phase of lung maturation (H&E x 100).

which are between 24th-34th weeks but they think that there is no enough proof for supporting repeated dose of antenatal corticosteroid.[5] We evaluated effects of antenatal single dose and repeated dose of betamethasone on dysplasia and organ maturation in our work. We determined head circumferences, lengths, birth weights, brain weights, brain widths and brain lengths of newborn subjects as the simplest developmental varieties.

Scheepens et al[6] showed that betamethasone caused somatic growth retardation and decrease in brain cell proliferation. No significant difference was found between groups which had single dose, repeated dose of betamethasone and saline solution for determining whole brain weight in premature rat groups ($p > 0.05$). A significant difference was found between both groups which took saline solution and single and repeated dose of betamethasone in groups of mature rats ($p<0.005$). The reason for not observing any significant difference in brain development of preterm rats may be that the time is not enough between corticosteroid usage and birth. Namely, even though corticosteroid usage has an effect on brain development, this effect may not be observed. Likewise, corticosteroid usage in mature rats and finding retardation within head confirm this opinion.

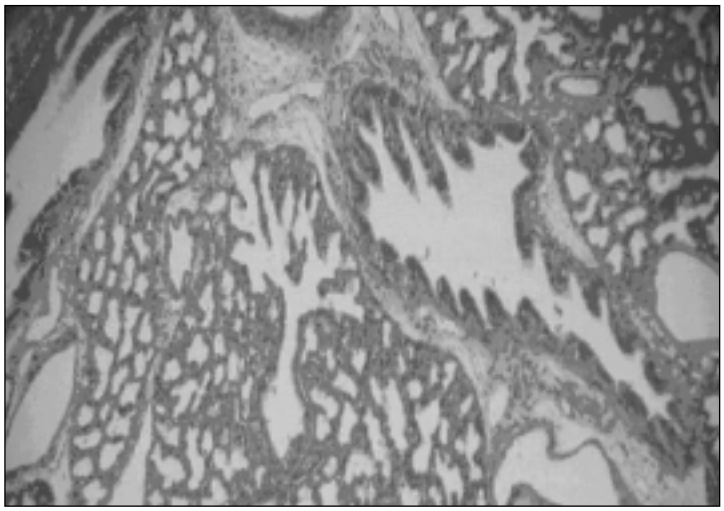

Figure 3. Saccular phase of lung maturation (H&E x 100).

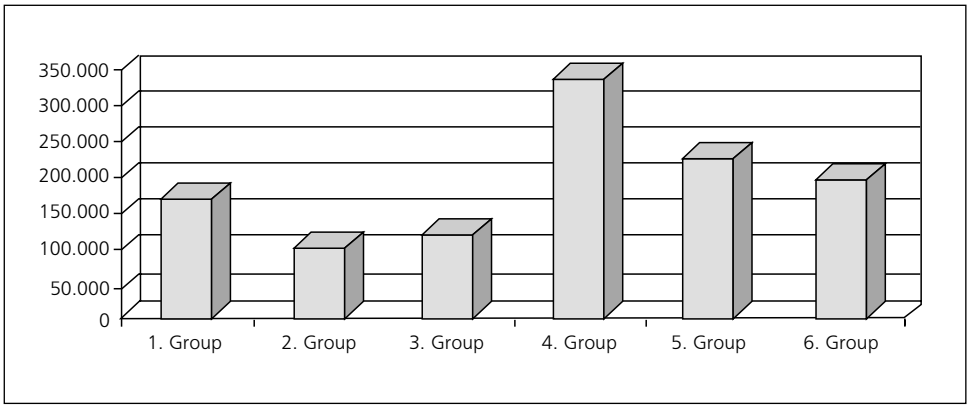

Diagram 1. Distribution of subjects as to their brain weight (mg).

Sloboda et al[7] mentioned that betamethasone application at pregnant sheeps caused a significant decrease in birth weight. It is not known exactly how glucocorticoids affect fetal growth. French et al4 showed that decrease rate in birth weights are related with dose repeat of glucocorticoid. No significant difference was found

No significant difference was found between groups which had single dose, repeated dose of betamethasone and saline solution for determining birth weight in groups of premature rats (p> 0.05). A significant difference was found between both groups which took saline solution and single and repeated dose of betamethasone for determining birth weight in groups of mature rats (p<0.005).

Noel et al[8] included pregnants into their work which took repeated dose of antenatal corticosteroid under 33 week in Western Australia and they examined effects of repeated dose of antenatal corticosteroid on birth weight and head circumference. They found that there was decrease in birth weight and head circumference in preterm pregnants which used repeated dose of antenatal corticosteroid.[8]

Table 1. Repeated dose of corticosteroid data in premature and mature rat groups.

	Premature			Mature		
Measurements	**Control (n=7)**	**Repeated dose (n=7)**	**P**	**Control (n=7)**	**Repeated dose (n=7)**	**P**
Birth weight (g)	2.62±0.22	1.97±1.42	0.57	5.48±1.33	3,40±1.11	0.001
Head circumference (cm)	2.82±0.33	2.41±1.08	0.19	3.51±0.32	3,22±0.63	0.03
Length (cm)	2.84±0.26	2.47±1.16	0.26	3.95±0.37	3,14±0.60	0.01
Brain weight (mg)	171.28±53.61	117.28±51.21	0.13	335.0±117.0	195,42±61.65	0.001

Table 2. Single dose of corticosteroid data in premature and mature rat groups.

	Premature			Mature		
Measurements	**Control (n=7)**	**Single dose (n=7)**	**P**	**Control (n=7)**	**Single dose (n=7)**	**P**
Birth weight (g)	2.62±0.22	1.85±0.25	0.19	5.48±1.33	4.28±1.36	0.04
Head circumference (cm)	2.82±0.33	2.13±0.22	0.11	3.19±0.32	3.70±0.47	0.49
Length (cm)	2.84±0.26	2.28±0.22	0.09	3.95±0.37	3.74±0.49	0.51
Brain weight (mg)	171.28±53.61	101.14±32.48	0.05	335,0±117.08	228.14±45.52	0.005

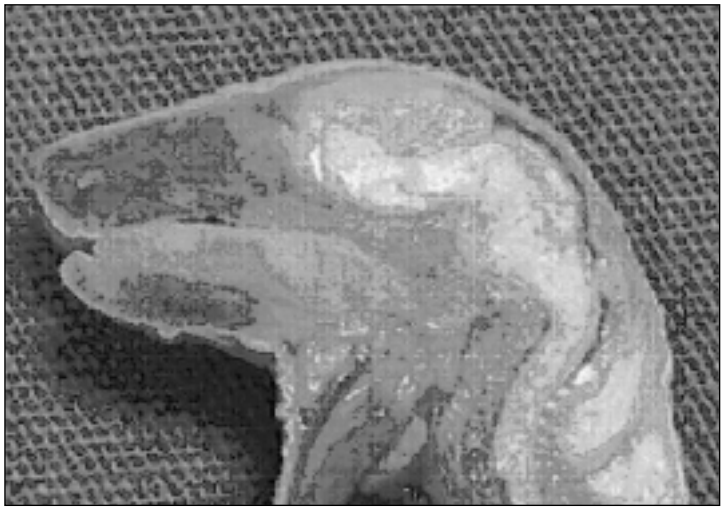

Figure 4. The head of the mature rat fetus.

In the determination of lung maturation phases, 85.7% of subjects which were applied single dose of betamethasone in mature group were found as canalicular phase and 14.3% of them were found as canalicular-saccular phase; 14.3% of subjects which were applied repeated dose of betamethasone were found as glandular-canalicular phase and 85.7% of them were found as canalicular phase; 14.3% of subjects which were applied saline solution were found as glandular-canalicular phase, 14.3% of them were found as canalicular phase, 28.6% of them were found as canalicular-saccular phase and 42.9% of them were found as saccular phase. 71.4% of subjects which were applied single dose of betamethasone in premature group were found as glandular phase and 28.6% of them were found as glandular-canalicular phase; 42.9% of subjects which were applied repeated dose of betamethasone were found as glandular phase and 14.3% of them were found as glandular-canalicular phase, 42.9% of them were found as canalicular phase; 71.4% of subjects which were applied saline solution were found as glandular-canalicular phase and 28.6% of them

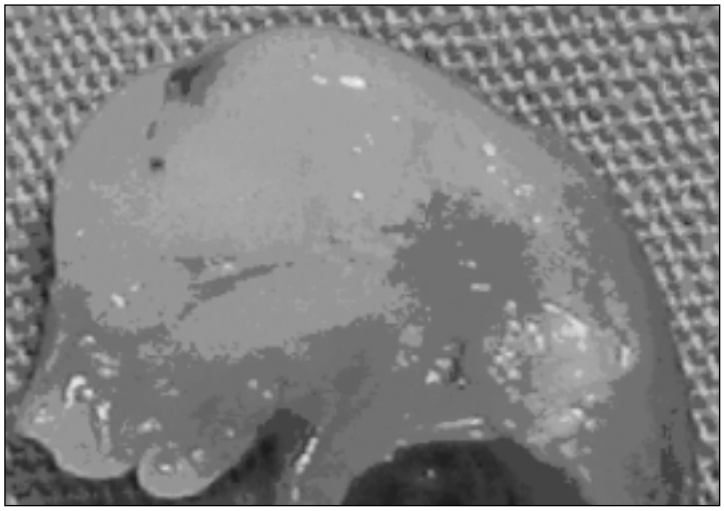

Figure 5. The head of the premature rat fetus.

were found as canalicular phase. Lung maturation phase of subjects which took single dose of betamethasone in premature group was found lower than group which took repeated doses of betamethasone. Also it is important that lung development in control group of preterm rats is higher than group which was applied single dose of corticosteroid.

Stephan et al compared the effects of single and repeated doses of antenatal betamethasone in between 24th-34th gestational weeks on neonatal sepsis and death. They reported that they got similar results in both groups in terms of respiratory distress syndrome and grade 3,4 intraventricular hemorrhage incidence risk.[9]

Consequently, we observed that repeated dose of betamethasone increased lung maturation in rats when compared with single dose. We found that there is no difference between effects of single and repeated doses of corticosteroid on brain and birth weight in premature rats. But the reason of this may be that the time is not enough between corticosteroid usage and birth.

References

1. NIH Consensus Development Panel on the Effect of Corticosteroids for Fetal Maturation on Perinatal Outcomes. Effect of corticosteroids for fetal maturation on perinatal outcomes. *J Am Med Assoc* 1995; 273: 413-18.
2. Uno H, Lohmiller L, Thieme C, Kemnitx JW, Engle MJ, Rocker EB et al. Brain damage induced by prenatal exposure to dexamethasone in fetal rhesus macaques. I: hippocampus. *Dev Brain Res* 1990; 53: 157-67.
3. Quinlivan JA, Archer MA, Dunlop SA, Evans SF, Beazley LD, Newnham JP. Fetal growth retardation, particularly within lymphoid organs, following repeated maternal injections of betamethasone in sheep. *J Obstet Gynecol Res* 1998; 24: 173-82.
4. French NP, Evans SF, Godfrey KF, Newnham JP. Repeated antenatal corticosteroids: size at birth and subsequent development. *Am J Obstet Gynecol* 1999; 180: 114-121.
5. Bennet L, Kozuma S, McGarrigle HH, Hanson MA. Temporal changes in fetal and cardiovascular, behavioural, metabolic and endocrine responses to maternally administered dexamethasone in the late gestation sheep. *Br J Obstet Gynaecol* 1999; 106: 331-339.
6. Scheepens A, van de Waarenburg M, van den Hove D, Blanco CE. A single course of prenatal betamethasone in the rat alters postnatal brain cell proliferation but not apoptosis. *J Physiol* 2003; 552: 163-75.
7. Sloboda DM, Newnham JP, Challis JRG. Effects of repeated maternal betamethasone administration on growth and hypothalamic-pituitary-adrenal function of the ovine fetus at term. *J Endocrinol* 2000; 165: 79-91.
8. Noel P, French MB, Ronald Hagan MB. Repeated antenatal corticosteroids: Size at birth and subsequent development. *Am J Obstet Gynecol* 1999; 180: 114-21.
9. Stephen T, Vermillion MD, David E, Soper MD, Roger B, Newman MD. Neonatal sepsis and death after multiple courses of antenatal betamethasone therapy. *Am J Obstet Gynecol* 2000; 183: 810-4.

Early Neonatal Outcomes of Term Breech Delivery

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Abstract

Objective: To evaluate early neonatal outcomes of term breech deliveries according to the mode of delivery.

Methods: Term (≥ 37 weeks gestation) singleton breech deliveries between January 1 2003 and December 31 2004 were reviewed retrospectively. Neonatal mortality, 1 and 5 minutes Apgar scores, neonatal birth trauma, neonatal convulsions, and neonatal care unit admission were compared due to the mode of delivery .

Results: : 41128 deliveries occured in our hospital between January 2003 – December 2004. 986 (2.39%) of them were term breech deliveries. 172 (17.4%)and 814 (82.6%) were delivered by vaginally and cesarian section, respectively. In the vaginal route group, 3 (1.7%) neonatal deaths were observed while no deaths was observed in the cesarian group (p=0.0001). 5 minute Apgar score of < 4 were observed 4 (2.3%) cases in the vaginal deliveries and no cases were observed in the cesarian delivery group (p=0.0001). Birth trauma was seen 7 (0.7%) newborns. 6 (3.5%) and 1 (0.1%) cases were delivered vaginally and cesarian section, respectively. (p=0.0001). 15 (1.5%) of them were admitted to the neonatal intensive care unit. Of those, 7 (4.1%) were delivered vaginally, 8 (1.0%) were delivered by ceserean section (p=0,008).

Conclusion: Term vaginal breech delivery is associated with increased mortality and morbidity in early neonatal period when compared with cesarean delivery.

Keywords: Breech presentation, route of delivery, neonatal outcomes.

Miadında makat doğumlarda erken neonatal sonuçlar

Amaç: Miadında makat doğumların, doğum şekline göre erken neonatal sonuçlarını değerlendirmek.

Yöntem: 1 Ocak 2003 – 31 Aralık 2004 tarihleri arasında doğum yapan miadında (≥ 37 gebelik haftası), tekil makat doğumlar retrospektif olarak değerlendirildi. Doğum şekline göre, neonatal mortalite, 1. ve 5. dakika Apgar skorları, yenidoğan doğum travması, yenidoğan konvülziyonu ve yenidoğan yoğun bakım ünitesi ihtiyacı bulunup bulunmamasına göre değerlendirildi.

Bulgular: Ocak 2003 – Aralık 2004 tarihleri arasında hastanemizde toplam 41128 doğum gerçekleştirildi. Bu doğumların, toplam 986 tanesi (%2.39) miadında makat doğumdu. Doğumların, 172 tanesi (%17.4) vaginal yoldan ve 814 tanesi (%82.6) sezaryen ile gerçekleşmişti. Doğum şekline göre yenidoğanlar neonatal ölüm oranları açısından karşılaştırıldığında, doğumun vaginal yoldan gerçekleştiği olguların 3 (%1.7) tanesinde neonatal ölüm meydana gelirken, sezaryen ile doğumun gerçekleştiği grupta neonatal ölüm izlenmedi (p= 0.0001). 5. dakika Apgar skoru vaginal doğumun gerçekleştiği 4 (%2.3) olguda <4 olarak tespit edildi ve sezaryen ile doğumun gerçekleştiği grupta Apgar skoru < 4 olan olguya rastlanmadı (p=0.0001) . Toplam 7 (%0.7) yenidoğanda doğum travmasına rastlandı, 6 (%3.5) olgu vaginal yoldan, 1(%0.1) olgu sezaryen ile doğmuştu (p=0.0001). Yenidoğan yoğun bakım ünitesine toplam 15 (%1.5) olgu kabul edildi. Bu olguların, 7 (%4.1) tanesi vaginal yoldan, 8 (%1) tanesi ise sezaryen ile doğmuştu (p=0.008).

Sonuç: Miadında vaginal makat doğum, sezaryen doğum ile karşılaştırıldığında erken neonatal dönemde mortalite ve morbidite artışı ile beraberdir.

Anahtar Sözcükler: Makat prezentasyonu, doğum şekli, neonatal sonuçlar.

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Introduction

Breech presentation is met about 3-4% in term deliveries. The aim of modern obstetrics is healthy mother and healthy fetus. Breech deliveries are closely related with concepts such as birth trauma, perinatal asphyxia, newborn death as to cephalic deliveries. It is thought for a long time that vaginal breech deliveries increase the mortality and morbidity of newborn when compared with cesarean delivery.

Delivery type which should be chosen in breech presentation is still a problem discussed on today. Disputes on this subject have increased in recent years and controversial results are mentioned in published retrospective works.[1-6] Debates about the administration of breech delivery complicate prospective works. To decide whether the delivery will be performed in vaginal or abdominal way by physician is so important after finding fetal and maternal situations (such as uterine anomaly, fetal anomaly, multiple gestation, premature, uterine myoma, placenta praevia etc.) creating tendency for breech presentation in a pregnant applied for breech presentation. Birth of a healthy baby from a healthy mother without complication is up to determine risk factors causing breech presentation, to act tenderer and more energetic in administration and inspection as to cephalic presentation by delivery physician.

This study is performed to get answers and to find solutions by the help of literature together with a general view for breech deliveries and to determine deliveries performed in Ministry of Health Istanbul Bakırköy Training and Research Hospital for Gynecology, Obstetrics and Pediatrics and thus to give a viewpoint and hint to physician in delivery approach in which maternal and fetal mortality and morbidity may be reduced.

Methods

Cases which were found term (≥ 37th gestational week) single breech presentation within pregnants applied to Ministry of Health Istanbul Bakırköy Training and Research Hospital for Gynecology, Obstetrics and Pediatrics in between 1st January 2003 – 31st December 2004 were reviewed retrospectively. Perinatal results were compared as to birth type (vaginal or abdominal way). The study was planned as retrospective cohort study.

Cases which were applied to emergency policlinic of our hospital and which were taken to maternity ward by deciding elective cesarean after finding breech presentation in term in the antenatal examinations were determined by being applied detailed anamnesis and physical examination, non-stress test, fetal ultrasonography, hemogram and blood type surveys. As to examinations;

- term and,
- single gestation cases
- at 37th gestational weeks and above were included to the study.

In early period ultrasonographies in term determination or ultrasonographies done in maternity ward in cases that did not know or not sure last menstrual period date, those who were proved that approximate fetal weight was more than 2500 gr were deemed as term.

After clinically pelvimetric determination of cases, it was found that regular vaginal examination was done for cervical maturation and dilatation investigating, and fetal cardiotocography was done for determining fetal healthiness to cases which were decided to deliver in vaginal way. Induction and amnions sac were waited to be opened spontaneously by oxytocin in appropriate cases. It was found that all newborns were done Bracht maneuver before all breech delivery maneuvers during vaginal delivery and if this maneuver was not worked, the delivery was performed by Mauriceau-Veit-Smellie maneuver after saving arms by using one of the arm saving maneuvers (classic, Lovset or Muler maneuver as to the preference of physician of delivery).

1 gr cefazolin sodium and antibiotic prophylaxis and non – stress test for determining fetal healthiness were applied to all cases which were decided abdominal delivery. Pfannenstiel and lower uterine segment transverse incision were applied

under general anesthesia to all cases which were performed cesarean.

Obstetrics and gynecology expert and assistant, pediatrist, anesthetist, midwife and newborn nurse were ready in delivery team during delivery in cases of vaginal birth.

All newborns born by cesarean or vaginal way were determined by physical examination by Children Health and Illness physician after delivery.

While determining cases to be included into the study groups, cases having following situations were excluded from the study;

- < 37th week pregnants
- Maternal systemic illness exist
- Multiple gestation
- Antenatal fetal death
- Major fetal congenital malformations (central nervous system anomalies such as spina bifida, meningomyelocele, exencephaly, anencephaly, hydrocephaly and microcephaly; major malformations such as intestinal atresia and congenital heart defect)
- Gestation and hypertensive illness (preeclampsia, eclampsia, gestational hypertension and chronic hypertension)
- Gestation and diabetes mellitus
- Intrauterine growth retardation.

All newborns delivered by vaginal way or cesarean were checked if followings were existed;

- Perinatal mortality
- Being < 7 of first minute APGAR score
- Being < 4 of fifth minute APGAR score
- Neonatal trauma
- Early neonatal convulsion
- Newborn intensive care requirement.

Neonatal death was defined as intrapartum death or death within one week after delivery.

Neonatal trauma was determined as intracerebral bleeding, cephalic trauma, cephalic haematoma, facial nervous clavicle, humerus or femur fracture and other traumas.

SPSS (Statistical Package for Social Science) for Windows 10.0 was used for statistics. Pearson – X^2, Fisher absolute test and t test for average of two independent groups were also used for comparing data together with complementary statistical methods (average, standard deviation) in order to determine study data. Statistical significance value p was accepted as < 0.05.

Results

Totally 41128 deliveries occurred in our hospital between January 2003-December 2004. Totally 986 (2.39%) cases appropriate to study criteria were included into the study. Within cases included into the study, 172 cases (17.4%) were delivered by vaginal way and 814 cases (82.6%) were delivered by cesarean. There was statistically no significance between cases delivered by vaginally or by cesarean in terms of gestational week and newborn birth weight (p=0.525, p=0.113); but as expected, age and parity was significantly low in group delivered by cesarean (p=0.001, p=0.0001). Nulliparity of vaginally delivered group was significantly lower than group delivered by cesarean (p=0.0001) (Table 1).

When comparing groups delivered by vaginally or cesarean as to being < 7 of first minute APGAR score; 1st minute APGAR score < 7 was found in 22 cases (12.8%) of vaginally delivered group and in 81 cases (10%) of group delivered by cesarean. Statistically no significance was found between two case groups (p=0.273).

Table 1. Demographic qualities of case groups delivered by vaginal way or cesarean.

	Breech vaginal delivery (n=172)	Breech cesarean delivery (n=814)	p
Age	28.62 ±5.07	27.30 ± 4.58	0.001
Gestational week	39.03 ± 1.59	38.95 ± 1.59	0.525
Parity	1 (0 – 10)	0 (0 – 6)	0.0001
Nulliparite	9 (% 5.2)	553 (%67.9)	0.0001
Birth weight (g)	3045.7 ± 453.1	3110.8 ± 497.3	0.113

Even though no newborn having APGAR score < 4 was found in case group delivered by cesarean when comparing 5th minute APGAR scores of newborns born by vaginally and by cesarean, it was found that 4 (2.3%) newborns in newborn group born by vaginally had 5th minute APGAR score < 4. There was statistically a significant difference between two case groups (p=0.0001).

Totally 7 (0.7%) birth traumas were found in both case groups. 6 birth traumas (3.5%) in vaginally delivered group and 1 birth trauma (0.1%) in group delivered by cesarean were met. Here are the birth traumas we met in both case groups;

- Brachial plexus damage at left arm
- Cerebellar haematoma
- Genital trauma in 2 cases (scrotal incision and scrotal haematoma)
- Haematoma at neck
- Diaphragmatic eventration
- Incision at lower extremity (in group born by cesarean)

When groups delivered by vaginally and cesarean were compared in terms of newborn trauma during delivery; newborn trauma was significantly high in case group delivered vaginally as to case group delivered by cesarean (p=0.0001).

When comparing case groups born by vaginally or cesarean in terms of newborn convulsion; convulsion occurred in 1 case (0.1%) in vaginally born group, no newborn convulsion was found in cesarean group. The difference between both groups were not found as significant (p=0.30).

Totally 3 (0.3%) cases died in perinatal period. These were in vaginal delivery group. Here are the death reasons of them;

1st case: It was born 3400 gr and died due to heavy perinatal asphyxia and intracranial bleeding on postpartum third day.

2nd case: It was born 2500 gr and died due to birth trauma and perinatal asphyxia on postpartum fifth day.

3rd case: It was born 2500 gr and died due to perinatal asphyxia on postpartum third day

No risk factor was found for these 3 cases in antenatal period examinations. The difference between both case groups was statistically found significant when they were compared in terms of newborn loss in perinatal period (p=0.0001).

7 cases (4.1%) from vaginal delivery group and 8 cases (1%) from cesarean delivery group were taken into newborn care unit when both groups were compared in terms of newborn intensive care unit. All of 7 newborns from vaginal delivery group were put in newborn unit due to birth trauma and asphyxiated birth. 4 of 8 cases from cesarean group which required newborn care unit were put in newborn unit due to dyspnea and 4 of them were put in newborn unit due to newborn sepsis diagnosis. The difference between both case groups was statistically found significant (p=0.008) (Table 2).

Discussion

Reducing birth trauma and perinatal asphyxia are within the most important purposes of delivery

Table 2. Newborn results as to birth type of term breech deliveries.

	Breech vaginal delivery (n=172)	Breech cesarean delivery (n=814)	p
1st min. APGAR < 7	22 (%12.8)	81 (%10.0)	0.273
5th min. APGAR < 4	4 (%2.3)	0	0.0001
Birth trauma	6 (%3.5)	1 (%0.1)	0.0001
Newborn convulsion	1 (%0,6)	0	0.30
Perinatal death	3 (%1.7)	0	0.0001
Requirement for newborn unit	7 (%4.1)	8 (%1.0)	0.008

medicine developing centuries. It has been thought for long times that vaginal breech delivery increases neonatal mortality and morbidity when compared with cesarean. This observation becomes a debate for last years and being retrospective of studies in this subject increased the debates.[1-6] Debates on breech delivery administration complicate randomized prospective studies and there are 3 randomized controlled studies comparing neonatal outcomes. First two studies published about 20 years ago and it was reported in these two studies that vaginal breech delivery cause minimal risk increase at properly chosen cases.[7-9] Hannah et al compared planned cesarean with vaginal breech delivery in cases with breech presentation in a big and multi-centered, prospective, randomized controlled study and they found that neonatal mortality and morbidity was lower in planned cesarean case group as to vaginal delivery group.[9] American and British Obstetrics and Gynecology Societies suggested planned cesarean in term, single breech presentation cases after this study.[10,11]

Brenner et al stated that mortality rate was 25% in 1016 breech delivery and the mortality rate was 2.6% in non-breech deliveries and that antepartum, intrapartum and neonatal deaths in all phases of gestation was significantly high.[1]

Tank et al saw that the most frequently seen damages were brain, spinal cord, adrenal glands and spleen in autopsy when they determined the outcomes of traumatic vaginal delivery.[12]

In an analysis performed in Netherlands in 57.819 cases, Schutte et al found that perinatal mortality was high in breech presentations even after correcting gestational age, congenital defects and birth weight.[13]

Krebs et al reported that cerebral palsy in fetuses with breech presentation had no relation with birth type; thus, medical intervention could not be successful for reducing perinatal mortality related with breech presentation.[14] This concept was expanded by Nelson and Ellenberg, they found non-cerebral malformation in 1/3 of children born by breech presentation and having cerebral palsy.

Flanagan et al found 1st minute Apgar scores of newborns which were breech presentation and born by vaginally were lower than those born by elective cesarean; but they could not find any increase in mortality and morbidity.[16]

Cheng and Hannah made a systematic research in world literature about term breech deliveries and they found 82 studies in literature published within 1966-1992 and they chose 24 of them for analysis. When they compared perinatal results between planned cesarean breech delivery and vaginal breech delivery, they observed that all death cases were in group delivered vaginally and all neonatal and morbidity occurred after trauma increased in vaginal delivery groups. They suggested preferring cesarean delivery for persistent breech presentation in term until a good planned randomized study having enough statistical power is performed.[17] Similarly, Gifford et al performed meta analysis of term breech delivery outcomes and these analyzes showed that trauma and asphyxia increased in vaginal delivery.[18]

In their study which was performed on 1433 pregnants, Pradhan et al compared planned cesarean birth at babies having breech presentation in term with cesarean birth at vaginal and labor in terms of perinatal mortality and morbidity; they found that 5th minute Apgar scores were statistically higher in planned cesarean group and newborn care unit requirement was lower in this group but they found that there was no significant difference between groups in terms of neonatal convulsion and birth trauma and they saw that 3 newborn death cases occurred in group delivered by vaginal and cesarean at labor. No significant difference was observed between groups in terms of special care at cerebral palsy and childhood periods.[19]

Gilbert et al evaluated 4952 vaginally delivered cases, 35297 cases delivered by cesarean at labor and 60418 cases delivered by elective cesarean which were totally 100667 cases delivered by breech presentation in term within 3.2 million cases and they found increased mortality and morbidity (asphyxia, brachial plexus injury, birth trau-

ma) in nullipara vaginal delivery as to cesarean before labor. They could not find difference for neonatal mortality between multipara group delivered by vaginally and group delivered by elective cesarean, but they found that morbidity (asphyxia, brachial plexus injury, birth trauma) increased in multipara group delivered vaginally.[20]

As a result of well-planned prospective randomized controlled 3 studies including 2396 cases at Cochrane Library Database, perinatal and neonatal deaths, heavy neonatal morbidity were found significant in pregnants with breech presentation being done planned cesarean in term.[21]

We could not find any difference between vaginal and cesarean breech deliveries in terms of first minute Apgar scores in our study; but when we looked to fifth minute Apgar scores which are more precious for determining perinatal asphyxia, we found that fifth minute Apgar score was significantly lower in vaginally delivered group (p=0.0001).

Birth trauma was quite high in vaginally delivered group (p=0.0001). We found complications such as diaphragmatic eventration (related with phrenic nerve palsy) and scrotal incision together with most frequently seen traumas in literature such as brain, spinal cord and genital trauma. Highness of newborn trauma in vaginal breech deliveries was compatible with the literature.

There was no significant difference between groups in terms of neonatal convulsion (p=0.30). Only convulsion was observed in newborn which was born vaginally and found diaphragm eventration and died postpartum fifth day in our study.

While early neonatal mortality was seen in 3 newborns in case group delivered vaginally, it was not observed in any case in case group delivered by cesarean and the difference between them was found significant (p=0.0001). This diagnosis was compatible with literature.

When groups were compared in terms of newborn care unit requirement, we found that requirement was significantly higher in vaginally delivered group (p=0.008). While 7 cases from vaginal delivery group were put in newborn unit due to birth trauma and asphyxiated birth; none of 8 cases was not related with trauma from cesarean group which was put in newborn unit. 4 of them were put in newborn unit due to dyspnea and 4 of them were put in newborn unit due to newborn sepsis diagnosis.

There are prospective studies which reported that fetus at breech presentation in term can be safely delivered by vaginal way providing to chose case well.[8,22-26] But legal regulations of countries changing in last years constrained physicians to consider vaginal breech delivery matter. Increased perinatal mortalities and morbidities which were found in groups delivered by vaginally brought tendency of cesarean delivery for fetuses in all breech presentation in term. Today, anesthesia, sterilization, operating room conditions and operator experience for developing cesarean decreased cesarean morbidity in terms of maternal state. This condition is one of the important reasons of increasing cesarean rates. External cephalic version seems as a good alternative for reducing this increased cesarean rates[27] and it may be a good option for developing countries like our country. But our knowledge is sufficient for now and more randomized controlled studies are needed.

Though insufficiency of current scientific data, it is thought that elective cesarean is safer for newborn as a result of studies published in recent years and of our study even though there is no consensus about the matter. We found in our study that asphyxia, newborn intensive care requirement, newborn trauma and neonatal death were significantly high in group delivered vaginally.

Conclusion

More prospective, randomized, controlled studies are needed for standardization of birth types found breech presentation in terms of mother and fetus health but it seems that it is hard to execute such studies in today's judicial conditions.

References

1. Brenner WE, Bruce RD, Handricks CH. The caracteristics and perils of breech Presentation. *Am J Obstet Gynecol* 1974; 118: 700-5.

2. Sanches-Ramos L, Weils TL, Adair CD, Arcelin G, Kavnitz AM, Wells DS. Route of breech delivery and maternal and neonatal outcomes. *Int J Gynecol Obstet* 2001; 73: 7-14.
3. Irion O, Almagbaly PH, Morabia A. Planned vaginal delivery versus elective caesarean section: A study of 705 singleton term breech presentations. *Br J Obstet Gynecol* 1998; 105: 710-7.
4. Thorpe – Beeston JG, Banfield PJ, Saunders NJ. Outcome of breech delivery at term. *BMJ* 1992; 305: 746-7.
5. Roman J, Bakos O, Cnattingius S. Pregnancy outcomes by mode delivery among term breech birth: Swedish experience 1987-1993. *Obstet Gynecol* 1998; 92: 945-50.
6. Confino E, Gleicher N, Elrod H, Ismojovich B, David MP. The breech dilemma. A review. *Obstet Gynecol Surv* 1985; 40: 332-9.
7. Collea JV, Chein C, Quilligan EJ. The randomised management of the term frank breech. A study of 208 cases. *Am J Obstet Gynecol* 1980; 137: 234.
8. Gimoski MI, Wallace RI, Schifrin BS. Randomized management of the non frank breech presentation at term: a preliminary report. *Am J Obstet Gynecol* 1983; 146: 34.
9. Hannah ME, Hannah WJ, Hewson SA, Hodnett ED, Saigal S, Willan AR. Planned caesarean section versus planned vaginal birth for breech presentation at term: a randomised multicentre trial. Term Breech Trial Collaborative Group. *Lancet* 2000; 356: 1375-83.
10. American Collage of Obstetricians and Gynecologists. Mode of term singleton breech delivery. ACOG committee Opinion no.265. Washington: American Collage of Obstetricians and Gynecologists, 2001.
11. Johanson RB. The management of breech Presentation. *RCOG Guideline* 2001; No:20.
12. Tank ES, Davis R, Holt JF, Morley GW. Mechanism of travma during breech delivery. *Obstet Gynecol* 1971; 38: 761.
13. Schutte MF, Van Homel OJS, Van de Berg C, Van de Pol A. Perinatal mortality in breech presentations as compared to vertex presentations in singleton pregnancies in the Netherlands. *Eur J Obstet Gynecol Reprod Biol* 1985; 19: 391.
14. Krebs L, Topp M, Langhoff-Ross J. The relation of breech presentation at term to cerebral palsy. *Br J Obstet Gynecol* 1999; 106: 943.
15. Nelson KB, Ellenberg JH. Antecedents of cerebral palsy. Multivariete analysis of risk. *N Engl J Med* 1986; 315: 81.
16. Flanagan TA, Mulchaley KM, Carol C. Management of term breech presentation. *Am J Obstet Gynecol* 1987; 156: 6.
17. Cheng M, Hannah M. Breech delivery at term: A critical review of the literature. *Obstet Gynecol* 1993; 82: 605.
18. Gifford DS, Morton SC, Fiske M, Kahn K. A meta-analysis of infant outcomes after breech delivery. *Obstet Gynecol* 1995; 85: 1047
19- Pradhan P, Mohajer M, Despende S. Outcome of term breech births:10-year experience at a district general hospital. *BJOG* 2005; 112: 218-22.
20. Gilbert WM, Hicks SM, Boe NM and Danielsen B. Vaginal versus cesarean delivery for breech presentation in California: a population-based study. *Obstet Gynecol* 2003; 102: 911-917.
21. Hofmeyr GJ, Hannah ME. Planned caesarean section for term breech delivery. *Cochrane Database Syst Rev* 2003; 3: CD000166.
22. Krebs L and Langhoff – Ross J. Elective cesarean delivery for term breech. *Obstet Gynecol* 2003; 101: 690-696.
23. Marieskind HI. Cesarean section in United States: Has it changed since 1979? *Brith* 1989; 16: 196-202.
24. De Crespigny LJ, Perperell RJ. Perinatal mortality and morbidity in breech presentation. *Obstet Gynecol* 1979; 53: 141.
25. Woods JA. Effecct of low birthweight breech delivery on neonatal mortality. *Obstet Gynecol* 1979; 53: 735.
26. Lelle RJ, Goeschen K, Wichman D, Schneider J. Retrospective analysis of 663 breech delivery at driving the years 1976 to 1985. *Z Geburtshilfe Perinatol* 1989; 193: 268-75.
27. HuttonE, Hofmeyr GJ. External cephalic version for breech presentation before term. *Cochrane Database Syst Rev* 2006; 25:CD000084.

Retrospective Analysis of 356 Amniocentesis Results Performed for Karyotype Analysis

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Abstract

Objective: The aim of this study is to evaluat the indications, karyotype results and maternal fetal complication of amniocentesis performed in our clinic.

Methods: We retrospectively analyed the results of 356 amniocentesis cases performed in our clinic between january 2001 and june 2005 for different indications.The cases are evaluated in respect to amniocentesis indication, complications, cell culture success and genetic results. After performance of ultrasound, amniocentesis of done by free hand technicue, 20-22 G needle in used and 1ml of amniotic fluid is taken for every week of pregnancy.

Results: The most frequent indication for genetic amniocentesis was found as advanced maternal age (%45). The cell cultures were succesful in 350 of cases and there were only 6 cases in which cell culture were unsuccesful. Abnormal caryotypes were detected in 12 of 350 (%3.3). Abnormal caryotypes were; one Trisomy 13 (%0.2), one Trisomy 18(%0.2) and 6 trisomy 21 (%1.7). Other chromosomal abnormalities were thought to be normal variants (%1.1). In amniocentesis done for advanced maternal age (35) and high risk in triple test chromosomal abnormality were found %1.2 (2/158) and %3.7 (5/134) respectively. In amniocentesis done for abnormalities diagnosed by ultrasound choromosomal abnormality was reported as %4 (1/25).

Conclusion: Amniocentesis is still a widely used technique in prenatal diagnosis due to low fetal loss rate and high diagnostic ability. Complication risk of amniocentesis is low for both mother and fetus should be done in advanced maternal age and in high risk in triple test as a prenatal diagnostic test.

Keywords: Amniocentesis, indication, complication, chromosomal analysis.

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Karyotip analizi amacıyla genetik amniyosentez uygulanan 356 olgunun retrospektif analizi

Amaç: Kliniğimizde amniosentez uygulanan olguların endikasyonlarını, karyotip sonuçlarını ve işleme bağlı feto-maternal komplikasyonları incelemektir.

Yöntem: Ocak 2001 ve Haziran 2005 tarihleri arasında kliniğimizde çeşitli endikasyonlar ile amniyosentez uygulanan 356 olgunun karyotip sonuçları retrospektif olarak değerlendirildi. Bu kapsamda olgular amniyosentez için endikasyon, komplikasyon, hücre kültürü başarısı ve genetik sonuçlar yönünden değerlendirildi. Ultrasonografiyi takiben 16-18. gebelik haftasında 20-22 G iğne kullanılarak serbest el tekniği ile amniyosentez işlemi uygulandı ve her işlemde gebelik haftası başına 1ml amnion sıvısı alındı.

Bulgular: En sık endikasyon ileri anne yaşı olarak tespit edildi (%45). Olgularımızdan 6'sı dışında 350 sinde kültürde hücre üretildi (%98). Karyotip analizleri yapılan 350 olgunun 12'sinde (%3.3) çeşitli kromozom anomalileri saptandı. Bunlardan 6 olguda Trizomi 21 (%1.7) birer olguda Trizomi 13 (%0.2) ve Trizomi 18 (%0.2) tespit edildi. Tespit edilen diğer anomaliler normal varyant (%1.1) olarak yorumlandı. İleri anne yaşı (35) nedeniyle amniosentez uygulanan olguların %1.2'sinde (2/158), üçlü testte yüksek risk (1/270) nedeniyle amniosentez yapılan olguların %3.7 sinde (5/134) kromozom anomalisi tespit edildi. Ultrasonografide (USG) anomali saptanan olguların %4'ünde (1/25) kromozom anomalisi saptandı.

Sonuç: Amniosentez yüksek tanı ve düşük fetal kayıp oranları ile prenatal tanıda halen en sık kullanılan yöntemlerdendir. Amniosentezin anne ve fetus için komplikasyon riski düşük olup, ileri yaş gebeliklerinde, üçlü tarama testinde yüksek risk tespit edilmesi durumunda prenatal tanı amaçlı amniosentez yapılmalıdır.

Anahtar Sözcükler: Amniosentez, endikasyon, komplikasyon, kromozom anomalileri

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Introduction

It is possible to obtain information about fetal karyotype nowadays by means of interventional processes used for prenatal diagnosis. Amniocentesis is the oldest well-known prenatal diagnosis method and fetal sex determination was first done by "Barr" corpuscle existence in fetal cells which was obtained by means of amniocentesis by Fucs and Riis in 1956.[1] Steel and Breg showed in 1966 that fetal karyotype determination is possible in amniotic fluid.[2]

Amniocentesis for genetic purpose was first performed by transvaginal way and was performed blindly in following 60s by transabdominal way. It was performed in areas that placenta did not exist by static ultrasonography in the beginning of 80s.[3] In the last three decades, the most frequent indication for genetic amniocentesis has been advanced age gestation. Many studies have been done in our country and centers shared their experiences about this subject. Cengizoglu et al reported that 109 amniocenteses were performed due to advanced maternal age in 46 cases and increased risk in triple test in 19 cases.[4]

Amniocentesis for genetic purpose is generally performed in between 16^{th} – 20^{th} gestational week after 15th week. Even though it is a reliable diagnosis method in the hands of experienced people, it has fetal loss and fetal-maternal complication risks. Total fetal loss, spontaneous abortus and intrauterine death rates were reported in change from 2.4% up to 5.2% in a multi-centered study done by Ager and Oliver.[5] It was found in the randomized controlled study published by Tabor et al in 1986 that fetal loss risk was increased 1% as to control group.[6] Being used of scanning tests and becoming widespread of determination by ultrasonography for diagnosis of chromosomal anomalies in recent years caused amniocentesis count to rise.

Indication distribution, complications and fetal karyotype results of genetic amniocentesis applications done by different indications within approximately last five years in our clinic were evaluated retrospectively in this study.

Methods

Results of 356 cases were evaluated retrospectively whose karyotype determinations were done in Medical Biology and Genetic Department and who were applied amniocentesis due to finding anomaly and aneuploid markers in ultrasonography (USG), high risk in triple test (≥1/270) in between pregnants above 35 years applied to polyclinic of Obstetrics and Gynecology Department. Cases were evaluated in terms of indication, complication, cell culture success and genetic results for amniocentesis.

Written consent was taken from couples who accepted application before intervention. All cases were evaluated before intervention in terms of being Hepatitis transporter and Rh impropriety. Hitachi EUB 520 model ultrasonography device and 3.5 MHz transabdominal probe were used for amniocentesis process. All fetuses were evaluated in detail by ultrasonography before process and placenta localization was determined. After ultrasonography, amniocentesis was performed to cases in localization far from placenta by using 20-22 G injector which were possible and was performed to cases by passing transplacental which were not possible in between 16^{th} – 18^{th} gestational weeks and 1 ml amnion fluid was taken per week in each process.

The material taken from amnion fluid for cytogenetic examination was sent to genetic laboratory of Genetic Illnesses Department. The protocol that Hoehn et al[7] used was performed in cell culture. Materials were examined by using 20 metaphases display analysis system after 15-20 days of cell culture. 350 cases whose karyotypes were determined were taken into the study. Family anamneses of cases with chromosomal anomaly were retrospectively researched. Complementary statistic was used as statistical method.

Results

Average gestational week of cases that had been applied karyotype analysis was found as 18.33±1.43 and age was found as 34.96±6.7. Karyotype results of 6 (1.6%) of 356 cases were could not obtained due to previous bleeding and contamination. Amniotic fluid infiltration lasting 24-48 hours was found after the process in 6 cases which were applied amniocentesis. Amniocentesis indications were found as following; advanced maternal age (45%), high risk in triple test (38%), anomaly and marker in ultrasonography (7.1%), birth with anomaly history (0.5%).

Chromosome anomaly was found in 12 (3.4%) of 350 cases after the result of karyotype analyses in produced cells. Trisomy 21 was found in 6 of

cases (1.7%), trisomy 13 was found in one case (0.2%) and trisomy 18 was found in one case (0.2%). Anomalies interpreted as normal variant were found in remaining cases (1.1%) (Table 1). Chromosome anomaly was found in 2 (1.2%) of 158 cases which were applied amniocentesis due to advanced maternal age (≥35) and both of them were interpreted as trisomy 21. Chromosome anomaly was found in 5 (3.7%) of 134 cases which were applied amniocentesis due to high risk in triple test (≥1/270). Trisomy 21 was found in two of them, trisomy 13 was found in one case and trisomy 18 was found in one case. Polydactyly and ventriculomegaly were found in detailed USG examination of case found trisomy 13. Age risk existed in addition to high risk in triple test in 11 of 356 cases which were applied amniocentesis. No chromosomal anomaly was found in these 11 cases.

Chromosome anomaly (trisomy 21) was found only in one case within 25 cases which were applied amniocentesis due to anomaly or marker in ultrasonography. Polyhydroamnios, acid in fetal abdomen and shortness equal to femoris length were found in ultrasonography of this case in 16th week. They were multiple anomalies which were found in USG in cases with anomalies. Markers were those which were found in trisomies (short femoris, short humerus, nape thickness, cardiac, renal, gastrointestinal and other anomalies). No repeating anomalies were found in histories of cases which were found chromosomal anomalies.

Table 1. Chromosomal anomalies found by amniocentesis.

No	Indication	Chromosome anomaly	
1	Advanced maternal age	47, XX, +21	(Down syndrome)
2	Advanced maternal age	47, XX, +21	(Down syndrome)
3	High risk in triple scanning	47, XX, +13	(Patau Syndrome)
4	High risk in triple scanning	47, XX, +18	(Edward's syndrome)
5	High risk in triple scanning	47, XX, +21,	inv 9 (Down syndrome)
6	High risk in triple scanning	47, XY, +21	(Down syndrome)
7	High risk in triple scanning	47, XY, +21	(Down syndrome)
8	High risk in triple scanning	46,XY, Yqh +	(Normal variant)
9	High risk in triple scanning	46,XY, Yqh+	(Normal variant)
10	High risk in triple scanning	46,XY, 22pstk+	(Normal variant)
11	High risk in triple scanning	45,XY,t(14:21)	Balanced translocation

Discussion

Chromosomal anomaly was found in 3.4% of cases in karyotype determination after genetic amniocentesis in retrospective examination of our cases. Chromosome anomaly rate was found as 2.5% which were determined pathologically. Both these and our other rates are close and compatible with rates reported in the literature. Period of 5 years of this work also covers our training period.

As known, states such as advanced maternal age, parental balanced translocation, child history with chromosome anomaly and fetal anomy existence, high risk in triple test in ultrasonography are indications of amniocentesis.[8] Even though it is known as a safe procedure in the hands of experienced people; there are rates of complication reported as changing related with centers.

Sener et al reported in their work that there may be amnionitis about 0.1% and amniotic fluid infiltration about 1-2%.[9] Also, maternal mortality related with *E.coli* sepsis was reported within 48 hours after amniocentesis.[10] Possible complications belonging to mother are rare in amniocentesis. These are; perforation in visceral organs, amnion fluid emboly and Rh sensitizasyon.[11]

Amniotic fluid infiltration complaint lasting 24-48 hours was found in our eight cases and amniotic fluid infiltration stopped within 36-48 hours by resting in bed without applying any medication in our series as complication. No oligohydroamnios or ascendant infection was found in any case after amniotic fluid infiltration. No fetal loss was found in first three weeks in any our cases after applied amniocentesis procedure. It was not possible to give any rate in terms of other complications due to the fact that all monitoring process of cases was not done in our clinic. Also no maternal complication was reported to us.

Our success for producing fetal cell from amnion in our series was found as 98%. This rate was found compatible with 98% success rate reported by Guven et al.[12] The reason for being unable of production in amniocyt cell cultures in 6 cases was thought it may be related with previous bleeding and contamination as reported by Yayla et al.[13]

Chromosome anomaly risk increases dramatically in advanced maternal age of gestation. Chromosome anomaly was found in two (1.2%) of 158 cases which were applied amniocentesis due to only advanced maternal age (≥35). This rate is low when it is compared with chromosome anomaly about 5.8% of that Taner et al examined amniocentesis results in 359 advanced maternal age

cases.[14] The result of this may be age interval of cases which were applied amniocentesis due to advanced age.

Amniocentesis was applied to 134 cases due to high risk in triple test (≥1/270) and chromosome anomaly was found in 5 cases (3.7%). Two of found chromosome anomalies were trisomy 21 (1.4%) and one of them was trisomy 13 (0.7%) and one of them was trisomy 18 (0.7%). Trisomy 21 was found in six cases (1.3%), trisomy 18 was found in two cases (0.4%) and trisomy 13 was found in one case (0.2%) in the study of Kim et al which was performed on 458 cases.[15] This rate was found as compatible with our results.

Rizzo et al[16] found chromosome anomaly in 16.8% of 273 fetuses that they found anomaly in ultrasonography and Dallaire et al[17] chromosome anomaly in 27.1% in fetal anomalies. Chromosome anomaly was found only in 4% of 25 cases that we applied amniocentesis due to anomaly in ultrasonography in our series. Polyhydroamnios and acid in fetal abdomen was found in ultrasonography in this mentioned case and risk in Triple test was mentioned as 1/450 in again this case. Our rate difference series were ultrasonography anomalies deemed as aneuploid marker that no fetal anomalies were observed such as oligohydroamnios in 6 cases and polyhydroamnios in 7 cases. Amniocentesis was applied to four cases of other fetal anomalies due to nuchal edema; it was applied to one case due bilateral fissure lip, it was applied to two cases due to renal anomaly, it was applied to two cases due to fetal cardiac anomaly, it was applied to one case due to short extremity, it was applied to one case due to hyperechogenic intestinal loops. Nose root was as flattened in remaining case and amniocentesis was applied on demand of the family.

Gestations were terminated on demand of family of all cases which were found chromosome anomaly except cases found as normal variant. Pregnancy of cases which were found normal variant was monitored up to the end of gestation and no perinatal complication was found.

Consequently; complication risk of amniocentesis is low for mother and fetus and amniocentesis for prenatal diagnosis purpose should be applied to cases which were found anomaly in ultrasonography in advanced age gestations, in the existence of high risk in triple scanning. Its most important disadvantage is to get results later than other perinatal methods. Detailed ultrasonographic examination should be applied to cases which were found low risk at triple scanning. Our prenatal diagnosis success is 98%. Chromosome anomaly rate we obtained with this study is 3.3%.

References

1. Fuchs F, Rıus P. Antenatal sex determination. *Nature* 1956; 177: 330.
2. Steele MW, Breg WR Jr. Chromosome analysis of human amniotic-fluid cells. *Lancet* 1966; 383: 1210.
3. Uludağ S. Prenatal Tanı Amacıyla Yapılan Girişimlerde Komplikasyonlar ve Zamanlama. *Perinatoloji Dergisi* 1999; 7: 281-90.
4. Cengizoğlu B, Karageyim Y, Kars B, Altundağ M, Turan C, Ünal O. Üç yıllık dönemdeki amniosentez sonuçları. *Perinatoloji Dergisi* 2002; 1: 14-7.
5. Ager RP, Oliver RW. In the risks of mid-tremester amniocentesis, being a comparative, analytical review of the major clinical studies. Salford 197, 1986.
6. Tabor A, Philip J, Madsen M, Bang J, Obel EB, Norgaard-Pedersen B. Randomised controlled trial of genetic amniocentesis in 4606 low-risk women. *Lancet* 1986; 1: 1287-93.
7. Hoehn H, Bryant EM, Karp LE, Martin GM. Cultivated cells from diagnostic amniocentesis in second trimester pregnancies. I. Clonal morphology and growth potential. *Pediatr Res* 1974; 8: 746-54.
8. Yayla M, Bayhan G, Yalınkaya A, Alp N. Yüksek riskli gebeliklerde 2. trimester genetik amniosentez: 165 0lgunun klinik değerlendirmesi. *Perinatoloji Dergisi* 1999; 7: 40-46.
9. Şener T. Complications of amniocentesis. *Ultrasonografi Obstetrik ve Jinekoloji* 1998; 2:11.
10. Thorp JA, Helfgott AW, King EA, King AA, Minyard AN. Maternal death after second-trimester genetic amniocentesis. *Obstet Gynecol* 2005; 105:1213-5.
11. Dodgson J, Martin J, Boswell J, Goodall HB, Smith R. Probable amniotic fluid embolism precipitated by amniocentesis and treated by exchange transfusion. *Br Med J* 1982; 294: 1322-3.
12. Güven MA, Ceylaner S. Amniosentez ve kordosentez ile prenatal tanı: 181 olgunun değerlendirilmesi. *Perinatoloji Dergisi* 2005; 13: 25-9.
13. Yayla M, Bayhan G, Yalınkaya A, Alp N. Amniosentez ve kordosentez ile fetal karyotip tayini: 250 olguda sonuçlar. *Perinatoloji Dergisi* 1999; 7: 14-7.
14. Taner CE, Altınbaşoğlu FH, Özkirişçi FH, İmren A, Büyüktosun C, Özgenç Y, Derin G. İleri maternal yaş gebeliklerinde amniosentez sonuçları. *Perinatoloji Dergisi* 2002; 4: 336-9.
15. Kim SK, Bai SW, Chung JE, Jung NY, Park KH, Cho DJ, Kim JW, Yang YH, Song CH. Triple marker screening for fetal chromosomal abnormalities in Korean women of advanced maternal age. *Yonsei Med J* 2001; 42: 199-203.
16. Rizzo N, Pittalis MC, Pilu G, Orsini LF, Perolo A, Bovicelli L. Prenatal karyotyping in malformed fetuses. *Prenat Diagn* 1990; 10: 17-23.
17. Dallaire L, Michaud J, Melancon SB, Potier M, Lambert M, Mitchell G, Boisvert J. Prenatal diagnosis of fetal anomalies during the second trimester of pregnancy: their characterization and delineation of defects in pregnancies at risk. *Prenat Diagn* 1991; 11: 629-35.

Fetal Nasal Bone Lenght Nomogram

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Abstratct

Objective: To obtain the nasal bone length nomogram throughout normal gestation with known prognosis, and to compare it with some other growth measurements.

Methods: Nasal bone lengths of 540 consecutive cases ranging between 11-39 weeks of pregnancy were measured by ultrasonography prospectively. Biparietal diameter (BPD) and femur lengths (FL) were obtained in the meanwhile. Nasal bone length nomograms of the 276 term fetuses, which were born alive and without malformation were obtained according to, BPD, FL, and gestational week. The correlation between variables was assessed by regression analysis.

Results: A linear growth pattern of the nasal bone length was obtained throughout gestation. (Nasal bone length= Gestational week x 0.42-2.81) (r2 = 0.94). A positive correlation was found between the growth of nasal bone length and the growth of other bone measurements.

Conclusion: Measurement of the nasal bone length during gestation shows a linear growth pattern according to gestational week, BPD and FL.

Keywords: Fetus, nasal bone, ultrasonography, nomogram

Fetal burun kemiği uzunluk nomogramı

Amaç: Prognozu bilinen normal gebeliklerde fetusun burun kemiği uzunluğu nomogramının elde edilmesi ve diğer büyüme ölçümleri ile karşılaştırılması.

Yöntem: Gebeliğin 11-39 haftaları arasında 540 olguda fetusun burun kemik uzunluğu prospektif olarak ultrasonografi ile ölçüldü. Eş zamanlı olarak biparietal çap (BPD) ve femur boyları (FL) elde edildi. Zamanında canlı doğum yapan, anomali saptanmayan 276 fetusun ölçümleri BPD, FL ve gebelik haftasına göre değerlendirilerek burun kemiği uzunluğu nomogramı oluşturuldu. Değişkenler arası korelasyon regresyon analizi ile araştırıldı.

Bulgular: Burun kemiği uzunluğunun intrauterin hayatta lineer tipte gelişim gösterdiği belirlendi (Burun Kemiği = Gebelik haftası x 0.42 – 2.81) (r2 = 0.94). Burun kemiği büyüme eğrisinin diğer kemik ölçümleri ile de pozitif korelasyon gösterdiği gözlendi.

Sonuç: Normal gebeliklerde fetusun burun kemiğinin ultrasonografi ile ölçümü gebelik haftasına BPD ve FL ölçümlerine uygun olarak lineer bir artış göstermektedir.

Anahtar Sözcükler: Fetus, burun kemiği, ultrasonografi, nomogram.

Introduction

Nasal bone is a structure which can be displayed by ultrasonography after 10th gestational week and it is actually formed of two different bones.[1] If it is not examined in an appropriate plan, it may be evaluated shorter or longer than normal and even it may be supposed as it does not exist.[2-4] Quality of the device, experience of the applier, oligohydroamnios, obesity, fetus position and gestational week may affect the success of determination.[2,5,6-8]

Measurement or only display of nasal bone is a leading method for early scanning of chromosome anomalies. It is shown that non-existence of nasal

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bone in especially first trimester and non-existence or hypoplasia of nasal bone may be found with chromosome anomalies.[5,9-13] (Figures 1 and 2). It is claimed that nasal bone length may show difference between races.[7,14,15]

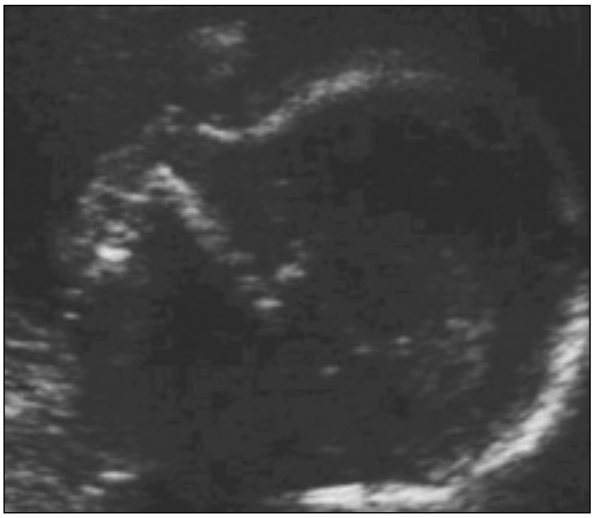

Figure 1. Normal nasal bone (17th gestational week).

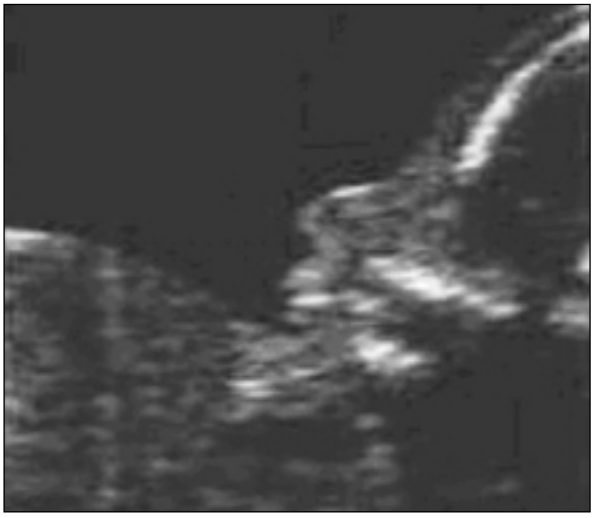

Figure 2. Nasal bone deficiency (15th gestational week).

Bone development curves which are one of the basic criteria of following fetus development can be applied to various bones of fetus. Biparietal diameter and femur length measurements are frequently used in daily practice. Furthermore, some other long bones are also help to distinctive diagnosis and scanning. Each bone which is able to be evaluated by ultrasonography may be leading in this process. Knowing how bones deviated from normal length after evaluation contributes to normal-abnormal distinction. For that reason, ultrasonography appliers have to evaluate his/her society's nomograms and have to compare them with international standards from time to time.

In this work, it is aimed to evaluate fetus nasal bone length as to gestational week and standard bone evaluations by ultrasonography and to obtain reference intervals and growth nomograms for certain gestational weeks.

Methods

Nasal bone lengths of fetuses of 540 pregnants who applied consecutively in between 01.09.2002 – 31.12.2003 were examined in this work. Routine ultrasonography examination was performed to each pregnant between 11th – 39th weeks. For gestational week, last menstrual period dates were taken as a base for those who have 28-32 days of menstrual period; crown-rump length (CRL) in first trimester, biparietal diameter (BPD) in second trimester, BPD and femur length (FL) measurements in last trimester were taken as a base for those who did not know the last menstrual period date. Cases with fetal anomaly, karyotype anomalies, multiple pregnants, those delivered dead and those delivered on 37th week or before, those which had birth weight under 10th percentile and over 90th percentile were excluded from the work. Nasal bones were displayed in low brightness setting by about 45 degree angle within the area that maxilla and frontal bone limits in central line and sagittal plans in which chin and lips were displayed in face profile of fetus (Figure 1). Each measurement was done twice and their average was taken. It was paid attention to align signs with the upper and lower edges of nasal bone in measurements. Minimum enlargement interval for calibration was adjusted as to be 0.1 mm. Cases were grouped at two weeks intervals. All examinations were done 5 mHz convex probe of Toshiba SSH 140-A model ultrasonography device. SPSS program was used for statistical analyzes, length of nasal bone was taken as dependent variable, linear regression analysis was applied by using SSPS 13 program and by matching gestational week with BDP and FL. P being less than 0.05 was taken as statistical significance limit.

Results

276 pregnants were found who were appropriate for research criteria during the study. Age intervals of these pregnants were 19 – 47 and their average age was found as 30.50±5.92. Totally 14 weeks groups were obtained. Average gestational week in which examination was performed was determined as 22.38±6.63 week. It was observed that case of 35th-36th gestational week was less but they did not change general average.

Nasal bone measurements within 95% confidence interval as to gestational week are shown in Table 1. A linear and positive correlation was found between gestational week and nasal bone in simple regression analysis. Descriptive coefficient of gestational week was r2=0.95 in nasal bone development. Relation between them was found statistically quite significant (p<0.001). Regression formula between gestational week and nasal bone was defined as: Nasal bone (mm) = Gestational

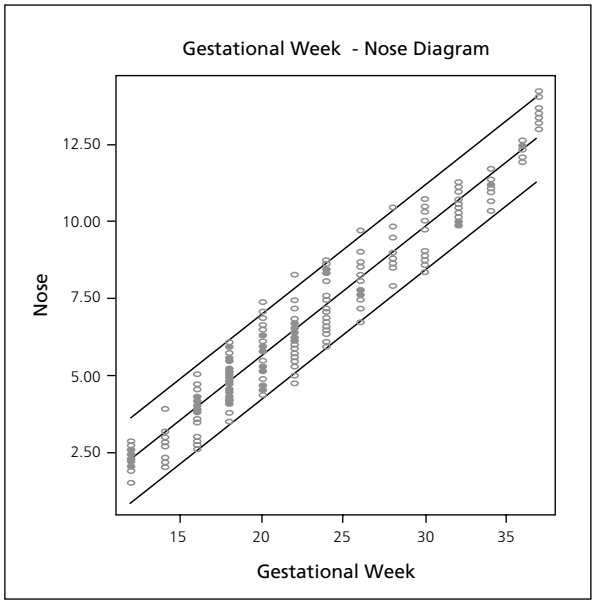

Diagram 1. Gestational week nasal bone length. Nasal Bone = (Gestational week x 0.42) – 2.81 r2=0.94; p<0.001

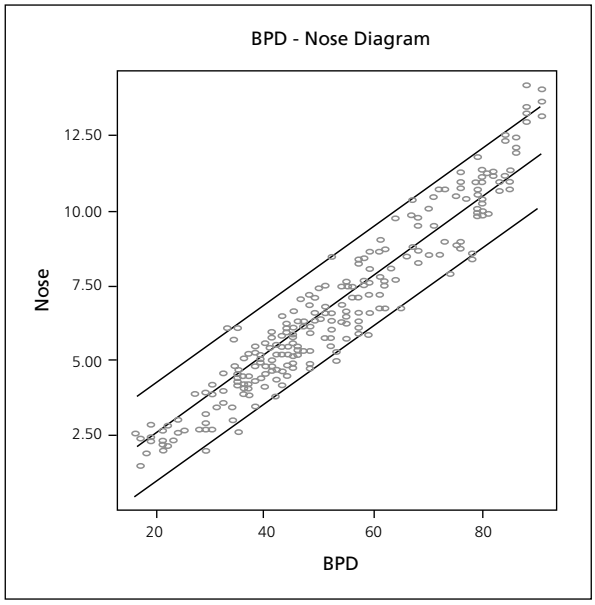

Diagram 2. Biparietal diameter nasal bone length. Nasal Bone = (BPD x 0.15) – 0.97 r2= 0.92; p<0.001

Table 1. Length nomogram of nasal bone as to gestational weeks.

					%95 Confidence Interval			
Week	**n**	**Average**	**Standard deviation**	**Standard fault**	**Down**	**Up**	**Minimum**	**Maximum**
11-12	12	2.29	0.39	0.10	2.06	2.52	1.50	2.85
13-14	10	2.86	0.67	0.21	2.39	3.34	2.00	3.95
15-16	21	3.81	0.70	0.15	3.49	4.13	2.60	5.05
17-18	48	4.82	0.66	0.09	4.64	5.01	3.50	6.10
19-20	44	5.62	0.76	0.11	5.39	5.85	4.35	7.40
21-22	35	6.39	0.76	0.13	6.12	6.65	4.75	8.30
23-24	26	7.27	0.86	0.17	6.92	7.61	5.95	8.75
25-26	14	8.03	0.78	0.21	7.58	8.48	6.75	9.75
27-28	9	9.16	0.77	0.26	8.56	9.75	7.95	10.50
29-30	11	9.46	0.89	0.26	8.88	10.05	8.40	10.80
31-32	16	10.50	0.50	0.13	10.23	10.77	9.90	11.30
33-34	15	11.06	0.34	0.09	10.87	11.25	10.40	11.80
35-36	6	12.29	0.24	0.99	12.04	12.55	12.00	12.60
37-38	9	13.48	0.44	0.15	13.14	13.82	13.00	14.25

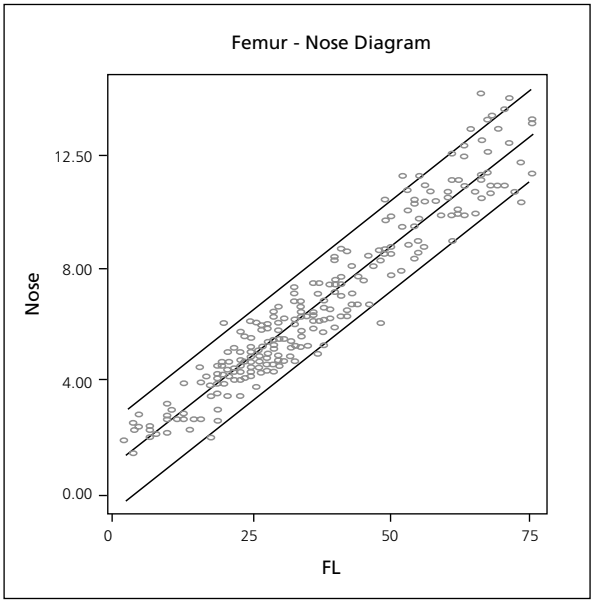

Diagram 3. Femur length – nasal bone length. Nasal Bone = (FLx0.16)+0.94 r2 = 0.92; p<0.001

week x 0.42 – 2.81 (Diagram 1). r2=0.94; (p<0.001).

Nasal bone length measurements were researched by BPD and FL which are other criteria showing growth of fetus and it was observed that both two criteria were in a positive relation with nasal bone and growth was linear type (Diagram 2, 3). Related formulas: Nasal Bone = (BPDx0.15) - 0.97; r2=0.92; p<0.001. Nasal Bone = (FLx0.16) + 0.94; r2=0.92; p<0.001. It was interpreted that the best descriptive variable for growth of nasal bone as mm was gestational week (growth of fetus).

It was observed that nasal bone length was changed about 2.29-3.81 mm in 11th-16th weeks, 4.82-6.39 mm in 17th-22nd weeks, 7.27-9.16 mm in 23rd-28th weeks, 9.46-11.06 mm in 29th-34th weeks and 12.29-13.48 mm in 35th-39th weeks.

Discussion

Ossification points in nose become to being formed in two sides of gristly focus in middle line beginning from 10th gestational week. While vomer bones first appear in U shape, they become V shape by getting unite in next weeks.[1] It was showed that this space may be determined as if it does not exist by mistake (about 20%) in the examinations done in that period.[16]

It should be observed in ultrasonographic examinations that nasal bones are formed of two bones uniting in the middle and lying to the front as echogenic structures. While bones do not pass upper – lower limits of orbitas in second trimester, they seem as two thin lines in the middle. The examination should be carried in neutral position of fetus and about 45-degree angle. Bones may not be displayed or may be measured less than their normal length in examinations under the angle of 45 degree or above 135.[4,17] This fault can be fixed by three dimensioned ultrasonography.[3] Also position of fetus affects closely displaying.[7,8] Nasal bones may not be displayed in early period (11th-14th weeks) examinations about 0.5-1%.6,9 This rate is higher in black race.[9]

CRL was reported as 42 mm in the earliest fetus size measurement that nasal bone might be seen in examinations done after abourtus.[1] It was claimed that these bones might be measured as from 0.8 mm in 10th gestational week.[18] The lowest measurement value in our study was 1.5 mm in 11th gestational week.

Nasal bones shows a linear growth characteristic in parallel to growth of other bones in body.[2] Obido et al reported that nasal bone development showed a linear increase tendency in 11th-20th gestational week.[19] The development is linear in second and third trimesters.[2] Guis et al found a linear increase about 4-12 mm in the length of nasal bone in their ultrasonographic measurements done in 11th-35th gestational weeks.[2] Bunduki et al found nasal bone length in between 5.9 and 8.0 mm in 16th-24th gestational weeks in their study performed on 1600 cases.[7] Sonek et al measured nasal bone in between 1.3-14.7 mm within 11th and 40 gestational weeks.[5] In our work, our diagnoses were changing between 2.2 – 11.0 mm in 11th-34th weeks, 3.8-7.2 mm in 16th-24th weeks, 2.2-13.4 mm 11th-38th weeks and growth tendency was in linear style as in other works. Existence of nasal bone is important especially in the first trimester scanning studies.[20] Existence and non-existence of bone are paid attention in spite of measurement. As it is known that ossification is late in fetuses with chromosome anomaly, it is claimed that cases with hypoplasia should be evaluated again and so wrong test positivity may decrease.[21] Nasal bone

length within 11th-14th gestational weeks showed change between 2.3 and 3.1 mm in series of Sonek et al.[5] Our findings showed similarly changes about 2.2-2.8 mm.

Ossification in nasal bones of fetuses with trisomy is delayed.[4,6] It was reported that nasal bone did not being observed within 11-14 weeks at 52% rate and at 43% rate within 14th-25th weeks in fetuses with trisomy 21 in a work in which ultrasonography and radiological examination were compared; they also reported that radiological examination is a golden standard for making determination.[11]

Cicero et al found nasal bone hypoplasia (<2.5 mm) at 61.8% rate in fetuses with trisomy 21 and they at 1.2% rate in normal fetuses in their series of 1046 cases they examined in between 15th-22nd gestational weeks.[10] They calculated that nasal bone hypoplasia increased trisomy 21 risk 50 times. It is interesting that this diagnosis is isolated in 14% of fetuses with trisomy 21. Hypoplasia rate was given as 0.5% for white race and as 8.8% for black race in the same study. We can not give any statistical rate due to the fact that chromosome anomaly cases are less in our work but we keep collecting data and we guess that we will be able to give results with many cases in the next series.

Consequently, while existence or non-existence of nasal bone are attached importance in first trimester examinations, obtaining bone length and determining nasal bone hypoplasia gain importance. Thus, determining nasal bone nomograms becomes important. It is possible to express 2.5 mm bone length limit value which is used in second trimester now by standard variables in near future. The pioneer series we inspected showed that nasal bone had a linear increase related with gestational week during gestation and they might be stated by formula. After this series we want to transfer broader series, it will be easier to compare deviations from normal in our society.

References

1. Sandıkçıoğlu M, Molsted K, Kjaer I. The prenatal development of the human nasal and vomeral bones. *J Craniofac Genet Dev Biol* 1994; 14: 124-34.
2. Guis F, Ville Y, Vincent Y, Doumerc S, Pons JC, Frydman R. Ultrasound evaluation of the length of the fetal nasal bone throughout gestation. *Ultrasound Obstet Gynecol* 1995; 5: 304-7.
3. Benoit B, Chaoui R. Three-dimensional ultrasound with maximal mode rendering: a novel technique for the diagnosis of bilateral or unilateral absence or hypoplasia of nasal bones in second-trimester screening for Down syndrome. *Ultrasound Obstet Gynecol* 2005; 25: 19-24.
4. Cicero S, Longo D, Rembouskos G, Sacchini C, Nicolaides KH. Absent nasal bone at 11-14 weeks of gestation and chromosomal defects. *Ultrasound Obstet Gynecol* 2003; 22: 31-5.
5. Sonek JD, Mckenna D, Webb D, Croom C, Nicolaides K. Nasal bone length throughout gestation: normal ranges based on 3537 fetal ultrasound. *Ultrasound Obstet Gynecol* 2003; 21: 152-5
6. Orlandi F, Bilardo CM, Campogrande M, Krantz D, Hallahan T, Rossi C, et al. Measurement of nasal bone length at 11-14 weeks of pregnancy and its potential role in Down syndrome risk assessment. *Ultrasound Obstet Gynecol* 2003; 22: 36-9.
7. Bunduki V, Ruano R, Miguelez J, Yoshizaki CT, Kahhale S, Zugaib M. Fetal nasal bone length: reference range and clinical application in ultrasound screening for trisomy 21. *Ultrasound Obstet Gynecol* 2003; 21: 156-60.
8. Yayla M, Uysal E, Bayhan G, Yalınkaya A. Gebelikte nazal kemik gelişimi ve ultrasonografi ile değerlendirilmesi. *Ultrasonografi Obstetrik ve Jinekoloji* 2003; 7: 20-24.
9. Cicero S, Bindra R, Rembouskos G, Spencer K, Nicolaides KH. Integrated ultrasound and biochemical screening for trisomy 21 using fetal nuchal translucency, absent fetal nasal bone, free beta-hCG and PAPP-A at 11 to 14 weeks. *Prenat Diagn* 2003; 23: 306-10
10. Cicero S, Sonek JD, Mckenna DS, Croom CS, Johnson L, Nicolaides KH. Nasal bone hypoplasia in trisomy 21 at 15-22 weeks' gestation. *Ultrasound Obstet Gynecol* 2003; 21: 15-8.
11. Larose C, Massoc P, Hillion Y, Bernard JP, Ville Y. Comparison of fetal nasal bone assessment by ultrasound at 11-14 weeks and by postmortem X-ray in trisomy 21: a prospective observational study. *Ultrasound Obstet Gynecol* 2003; 22: 27-30.
12. Cicero S, Spencer K, Avgidou K, Faiola S, Nicolaides KH. Maternal serum biochemistry at 11-13(+6) weeks in relation to the presence or absence of the fetal nasal bone on ultrasonography in chromosomally abnormal fetuses: an updated analysis of integrated ultrasound and biochemical screening. *Prenat Diagn* 2005; 25: 977-83.
13. Viora E, Errante G, Sciarrone A, Bastonero S, Masturzo B, Martiny G, et al. Fetal nasal bone and trisomy 21 in the second trimester. *Prenat Diagn* 2005; 25: 511-5.
14. Zelop CM, Milewski E, Brault K, Benn P, Borgida AF, Egan JF. Variation of fetal nasal bone length in second-trimester fetuses according to race and ethnicity. *J Ultrasound Med* 2005; 24: 1487-9.
15. Collado F, Bombard A, Li V, Julliard K, Aptekar L, Weiner Z. Ethnic variation of fetal nasal bone length between 11-14 weeks' gestation. *Prenat Diagn* 2005; 25:690-2.

16. Peralta CF, Falcon O, Wegrzyn P, Faro C, Nicolaides KH. Assessment of the gap between the fetal nasal bones at 11 to 13 + 6 weeks of gestation by three-dimensional ultrasound. *Ultrasound Obstet Gynecol* 2005; 25: 464-7.

17. Sonek JD, Nicolaides KH. Prenatal ultrasonographic diagnosis of nasal bone abnormalities in three fetuses with Down syndrome. *Am J Obstet Gynecol* 2002; 186: 139-41.

18. Kanellopoulos V, Katsetos C, Economides DL. Examination of fetal nasal bone and repeatability of measurement in early pregnancy. *Ultrasound Obstet Gynecol* 2003; 22:131-4.

19. Odibo AO, Sehdev HM, Dunn L, McDonald R, Macones GA.The association between fetal nasal bone hypoplasia and aneuploidy. *Obstet Gynecol* 2004; 104: 1229-33.

20. Nicolaides KH. Nuchal translucency and other first-trimester sonographic markers of chromosomal abnormalities. *Am J Obstet Gynecol* 2004; 191: 45-67.

21. Cicero S, Rembouskos G, Vandecruys H, Hogg M, Nicolaides KH. Likelihood ratio for trisomy 21 in fetuses with absent nasal bone at the 11-14-week scan. *Ultrasound Obstet Gynecol* 2004; 23: 218-23.

The Incidence of Nuchal Cord at Delivery and Its Effect on Perinatal Outcome

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Abstract

Objective: The aim of this study was to determine the incidence of nuchal cord at delivery, and to investigate the effect of nuchal cord on the course of labor and perinatal outcome.

Methods: The delivery cases of 1112, sigleton, vertex presentation pregnancies undergoing spontaneous labor between January 1.2003 and November 1.2005 were included in the study.The cases with maternal and fetal complications were excluded from the study. Pregnancies with and without nuchal cord entanglement were compared with respect to labor characteristics and perinatal outcomes.

Results: The incidence of nuchal cord entanglement was found to be 16.5% in the study group. There were no statistically significant differences in the rates of neonatal intensive care requirement and 5-minute Apgar scores between pregnancies with and without nuchal cord entanglement. The rates of fetal distress during labor, cesarean section and vacuum deliveries were significantly higher in the cases with nuchal cord entanglement compared with women without nuchal cord entanglement.The rate of fetal distress during labor in pregnant women with nuchal cord entanglement complicated with oligohydramnios was significantly higher than that in cases of nuchal cord with normal amniotic fluid volume. In the absence of oligohydramnios, nuchal cord entanglement did not significantly increase fetal distress rate during labor.

Conclusion: There is no significant correlation between nuchal cord entanglement and adverse perinatal outcomes. Therefore nuchal cord entanglement alone is not an indication for cesarean section. On the otherhand, because of an incresed risk for fetal distress during labor in cases of nuchal cord entanglement associated with oligohydramnios,the labor of these pregnancies should be monitored carefully.

Keywords: Nuchal cord, labor, perinatal outcome.

Doğumda boyunda kordon dolanması sıklığı ve perinatal sonuçlar üzerine etkisi

Amaç: Doğumda kordon dolanması saptanan olgularda, kordon dolanması sıklığının, doğum eylemi ve perinatal sonuçlar üzerine etkisini araştırmak.

Yöntem: 1 Ocak 2003 - 1 Kasım 2005 tarihleri arasında tek, baş prezantasyonu ile spontan travaya girerek doğumu gerçekleşen 1112 olgu çalışmaya dahil edildi. Maternal ve fetal komplikasyonlu olgular çalışmaya dahil edilmedi. Çalışma grubunda kordon dolanması insidansı saptandı. Kordon dolanması olan ve olmayan grupların doğum eyleminin karekteristikleri ve perinatal sonuçlar karşılaştırıldı. İstatistiksel değerlendirmede student t ve χ^2 testleri kullanıldı. p değerinin 0.05'den küçük olması anlamlı kabul edildi.

Bulgular: Çalışma grubumuzda boyunda kordon dolanması insidansı %16.5 olarak saptandı. Kordon dolanması olan ve olmayan gruplarda 5. dakika Apgar skoru ve yenidoğan yoğun bakım ünitesinde tedavi oranları arasında istatistiksel olarak anlamlı farklılık yoktu. Boyunda kordon dolanması olan olgularda travayda fetal distres gelişimi, sezaryen ve vakum ekstraksiyon oranları boyunda kordon dolanması olmayan olgulara göre istatistiksel olarak anlamlı ölçüde yüksek bulundu ($p<0.05$). Travayda fetal distres gelişiminin, boyunda kordon dolanması ve oligohidramniosu olan olgularda, boyunda kordon dolanması olup oligohidramniosu olmayan olgulara göre istatiksel olarak anlamlı şekilde arttığı izlendi ($p=0.001$). Oligohidramniosu olmayan olgularda boyunda kordon dolanmasının travayda fetal distres gelişmesini anlamlı ölçüde arttırmadığı izlendi ($p=0.180$).

Sonuç: Boyunda kordon dolanması ile kötü perinatal sonuçlar arasında anlamlı bir korelasyon mevcut değildir. Bu nedenle boyunda kordon dolanması tek başına sezaryen endikasyonu değildir; kordon saptanan olgularda doğum yönetiminde bir değişiklik yapılmasına gerek yoktur. Bununla birlikte, boyunda kordon dolanması ve oligohidroamnios ile seyreden olguların travayı sırasında fetal distres gelişme riskini önemli ölçüde arttığından, bu tür gebelerin travayının yakından izlenmesinde yarar vardır.

Anahtar Sözcükler: Boyunda kordon dolanması, doğum eylemi, perinatal sonuçlar.

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Introduction

Cord entanglement is defined as turning 360 degree of umbilical cord around fetal neck and it is seen in 15.8%–30% of term gestations and in 6% of gestations at 20th week and it is determined as not a problem.[1,2] Cord entangling to the fetus body and its extremities or knotting on itself is rarely seen.[1] Collins defined cord entanglement to neck as A and B types.[3] Type A: Umbilical cord circle entangles to fetus neck at 360 degree and placental edge passes over umbilical edge. This entanglement can be spontaneously opened due to it is not knotted. Type B: Umbilical cord circle entangles to fetus neck at 360 degree and placental edge passes under umbilical edge. This entanglement can not be spontaneously opened due to it is knotted.

Shui and Eastman reported single cord entanglement as 20.6%, double cord entanglement as 2.5% and triple cord entanglement as 0.2% in 1007 fetus deliveries.[4] Moreover, there are case representations reporting that the cord entangles nine times.[5] There is a linear increase in single or multiple cord entanglement parallel to increase in gestational age and this rate increases more after 38th gestational week.[6] Increase in movements of fetus through third trimester and turning movements towards head presentation may be effective factors for cord entanglement. It is also reported that cord entanglements found prenatally by ultrasonography can be untied spontaneously before 36th gestational week.[7] Clinical importance of cord entanglement should be discussed. Even though no complication is observed on fetus in many studies,[1,2] there are some publications reporting increased variable deceleration in first and second trimester of delivery, acidaemia, lowness of evidently increased first minute of Apgar score, increase in amnios fluid frequency painted with meconium, increase in urgent cesarean delivery frequency, increase in resuscitation of newborn, increase in staying and period of staying of newborn in intensive care unit and increase in newborn deaths.[8] We researched frequency of cord entanglement, its effect on delivery and its neonatal results in cases having cord entanglement in neck at delivery in our study.

Methods

1112 cases were included to our study which were including term and postterm pregnancies that had delivery by spontaneous labor by single head presentation in between 1st January 2003 – 1st November 2005 in our clinic. Multiple gestations, cases with fetal anomaly, dead fetus cases, cases with early membrane rupture, placenta praevia, ablatio placenta, cesarean cases done by elective and repeated indication, intrauterine infection, abnormal fetal presentations were not included to study. Ages, gestational weeks at delivery, birth count, birth types, birth weights, birth Apgars', fetal distress development during labor, oligohydroamnios frequency, existence of cord entanglement at neck and entangled circle count, meconium existence in amnios fluid, staying and staying period of newborn in intensive care unit, body mass index (BMI) and length of mother at delivery were determined. While term gestation was defined as 37+0 (259 days) and 42+0 (294 days) weeks of gestation, postterm gestation was defined as gestations of 42+1 (295 days) weeks or above. CRL measurements evaluated by ultrasonography in first trimester were taken as base for properly calculating gestational age. Cord entanglement diagnosis was clinically done by doctors at delivery. Fetal distress diagnosis in labor was found as to American College of Obstetricians and Gynecologists Technical Bulletin (ACOG).[8] Oligohydroamnios was diagnosed by founding vertical amnios pocket less than 2 cm in ultrasonography during labor. Fetal heart beats were monitored continuously in active phase of delivery routinely. Statistical determination was done by using X^2 and student t tests.

Results

Cord entanglement at neck was found in 184 (16.5%) of 1112 cases at delivery. Cord circle count entangled at neck was found as 1 times in 140 cases (12.6%), 2 times in 36 cases (3.2%), 3 times in 17 cases (1.5%), 4 times in 2 cases (0.2%) and 5 times in 1 case (0.08%). Age average of 184 cases having cord entanglement at neck was found as 27.15±4.60, their average gestational week at deliv-

ery was found as 276.17±8.07 days, average birth weight of fetus was found as 3342.06±497.83 gr and parity average was found as 1.67±0.75. Age average of 928 cases having no cord entanglement at neck was found as 27.63±4.32, their average gestational week at delivery was found as 273.81±7.77 days, average birth weight of fetus was found as 3288.93±499. 11 gr and parity average was found as 1.47±0.72.

60.1% (558/928) of cases having no cord entanglement at neck was primipara and 39.9% (370/928) was multipara. No significant difference was found between two groups in terms of parity (p=0.159; OR, 0.823; 95% CI, 0.626-1.080).

There was no significant difference between maternal age, length, body mass index, parity, gestational week at delivery (as day), average weight of fetus in cases having and not having cord entanglement at neck and demographic and clinical qualities are shown in Table 1.

No perinatal mortality was observed in cases having and not having cord entanglement. Fetal distress development at labor was found in 29 (15.8%) of 184 cases having cord entanglement at neck and found in 88 (9.5%) of 928 cases not having cord entanglement. Fetal distress development was found statistically significant between cases having and not having cord entanglement at neck (p=0.025; OR, 1.662; 95% CI, 1.061-2063).

Rate of cesarean and vacuum deliveries which were done due to acute fetal distress (AFD) and not processing labor was found as 29.3% (54/184) in group having cord entanglement and was found as 6.6% (61/928) in group not having cord entanglement and statistically a significant difference was found between both groups (p<0.01; OR, 4.465; 95% CI, 2.996-6.653).

It was found that fetal distress developed at labor in 14 of 35 cases having oligohydroamnios and cord entanglement at neck. It was observed that fetal distress development at labor was significantly and statistically increased in cases having oligohydroamnios and cord entanglement at neck as to cases not having oligohydroamnios and cord entanglement at neck (p=0.001; OR, 3.973; 95% CI: 1.757-8986). It was seen that cord entanglement was did not increase fetal distress development at labor significantly in cases without oligohydroamnios (p=0.180; OR, 1.566; 95% CI: 0.809-3.028).

Distributions and indications of interfered births as to birth types of cases found and not found cord entanglement at neck are shown in Table 2. Operative birth rate (cesarean + vacuum) was found as 29.3% (54/184) in group having cord entanglement and as 6.6% (61/928) in group not having cord entanglement. Operative birth rates of group having cord entanglement were statistically and significantly higher than rates of group not having cord entanglement (p<0.01; OR, 4.465; 95% CI, 2.996-6.653).

Interfered birth (cesarean + vacuum) rate due to not processing labor of cases having cord entanglement was statistically and significantly difference than cases not having cord entanglement (p<0.01; OR, 5.516; 95% CI: 3.330-9.139).

There was no significant difference between 5th minute Apgar scores of cases having and not having cord entanglement at neck (p 0.078; OR, 2.207; 95% CI, 0.895-5.439).

Being with meconium of amnios fluid in group having cord entanglement was higher than group not having cord entanglement and there was sta-

Table 1. Demographic qualities of women having and not having cord entanglement in fetus.

	Cord entanglement (+)	Cord entanglement (–)	p
Maternal age	27.15±4.60	27.63±4.32	0.333
Maternal length (cm)	161.36±5.02	162.80±5.01	0.092
BMI	28.13±3.66	28.23±3.28	0.781
Parity	1.62±0.74	1.47±0.72	0.065
Gestational age (day)	276.17±8.07	273.81±7.77	0.103
Birth weight (gr)	3342.06±497.83	3288.93±499.11	0.333

Values are given as average ± standard deviation. **BMI:** body mass index.

Table 2. Birth types and indications of cases having and not having cord entanglement at neck.

Birth type	Indication	Cord (+)		Cord (–)		
		n	%	n	%	p
Cesarean	AFD	16	8.7	22	2.4	<0.001 (a)
	Not processing labor	35	19	32	3.4	<0.001 (a)
Vacuum	AFD	2	1.1	5	0.5	0.329 (ad)
	Not processing labor	1	0.5	2	0.2	0.420 (ad)
SVB	AFD	11	6	61	6.6	0.778 (ad)

AFD: acute fetal distress, **SVB:** spontaneous vaginal birth, **n:** case numberı, **a:** statistically significant, **ns:** statistically not significant.

tistically a significant increase (p=0.001; OR, 3.519; 95% CI: 2.151-5.757). But it was found that amnios fluid with meconium did not affect perinatal mortality.

Statistically, no significant difference was found between two groups in terms of staying rates of newborns in newborn care unit (p=0.074; OR, 1.538; 95% CI: 0.956-2.472).

There was an increase in favor of male sexuality in fetal sexuality rates in group having cord entanglement (56%). But this increase was not significant when compared with the group not having cord entanglement (p=0.450; OR, 1.108; 95% CI: 0.956-2.472). Qualities of fetus between both groups are shown in Table 3.

It was found that placenta settlement in group having cord entanglement occurred mostly in anterior (47%, 86/184); but when it was compared with the group not having cord entanglement, it was not statistically significant (p=0.340; OR, 1.147; 95% CI: 0.865-1.522).

Discussion

It is reported that cord entanglement at neck takes place about 5-18% in reasons of fatal perinatal asphyxia together with other cord complications such as real knot at cord and cord prolapsus.[10] It is claimed that cord entanglement does not affect the labor negatively.[11,12] On the other hand, it is reported that the cord entanglement is the reason of antepartum and intrapartum variable deceleration and intrapartum fetal distress may occur due to increase of cord tightening in next phases of birth.[1,13,14] It is reported that complications such as cord entanglement at neck, real not at cord and cord prolapsus are seen in 48% of asphyxiated newborns reached up to the term, it is observed that fetal asphyxia frequency increases parallel to the increase of entangled cord circle count and these complications are fatal in 5-18% of them.[13] We found a significant difference in fetal distress development between groups having and not having cord entanglement in our study.

Researching cord entanglement at neck is not done routinely before birth but existence of variable deceleration at fetal heart beats in cardiotocography during labor reminds us cord entanglement.[12] Cord entanglement was first defined by ultrasonography by Joupila and Kirkinen[15] in 1982 and there are obstetric works done by using ultrasonography since then.[1,12] There are studies done by colored Doppler in recent years.[17,18] Generally,

Table 3. Qualities of fetuses having and not having cord entanglement at delivery.

	Cord entanglement (+)		Cord entanglement (–)		p
	n	%	n	%	
Male fetus	103	56	469	50.5	0.450 (ad)
Meconium	30	16.3	43	4.6	>0.001 (a)
Staying at ICU	25	13.6	82	8.8	0.074 (ad)
Apgar (5th Apgar > 7)	7	3.8	16	1.7	0.078 (ad

ICU: Intensive care unit, **s:** statistically significant, **ns:** statistically not significant, **n:** case number.

colored Doppler examination has diagnostic value for rupture of fetal membrane. Three dimensioned ultrasonography was used in works related with cord entanglement and it is claimed that it is more advantageous than colored Doppler study.[18]

As cord entanglement is related with very different factor, most of performed studies are done with case representations or little series. There are publications which show the relationship of cord entanglement with shoulder presentation, fetal right side position, male fetus, increased fetal activity, decreased fetal movement, abnormal umbilical artery Doppler diagnoses,[18,19] abnormal ductus venous flows,[20] posterior settled placenta,[21] birth induction,22 variable decelerations in fetal heart beatings,13,22 amnios fluid painted with meconium,[13,22,23] shoulder dystocia,[23] operative vaginal birth,[13] birth by urgent cesarean,[23] intrauterine growth retardation,[25,26] lower apgar score,[13,14,22] increased staying in newborn unit,[23] increased newborn resuscitation,[22] umbilical artery acidaemia,[13] hypovolemic shock of newborn,[12] dural sinus dilatation,[27] dead birth,[28,29] cerebral paralysis.[30,31] Despite these reports, it is reported in some studies that cord entanglement is together with normal neonatal and maternal outcomes.[1,2,11,12] We found in our study that amnios fluid painted with meconium rate in group having cord entanglement was increased significantly as to group not having cord entanglement but there was no significant increase in staying at ICU, lower Apgar score and lower birth weight.

While there are publications reporting that cord entanglement causes urgent cesarean rates to increase due to fetal distress,[13,22,32] there are also publications reporting that it does not cause urgent cesarean rates to increase. We found an increase in rates of interfered birth (cesarean + vacuum) in cases having cord entanglement. There are also publications reporting that cord entanglement increases the perinatal mortality.[31] But these publications are retrospective. In many works, it is reported that dead birth rates do not increase if there is no especially hypertension, ablatio placenta, diabetes, premature rupture of membranes, oligohydroamnios and major fetal anomalies.1[3,25] It was mentioned in these publications that cord entanglement in cases without oligohydroamnios did not affect fetal distress development at labor significantly but it affected fetal distress risk at labor in cases with oligohydroamnios.[32] We observed in our study that cord entanglement and fetal distress development increased significantly in cases with oligohydroamnios as to cases without oligohydroamnios. Cord tightening during contractions may be the reason of fetal distress development at labor and cord entanglement in cases having oligohydroamnios. Fetal distress frequency will increase due to the fact that cord tightening will be easier and frequently in cases with oligohydroamnios.

Cord entanglements are generally not affects fetus weight and prognoses of fetus and mother negatively.[31] Single entanglement of cord at neck is described as a natural diagnosis and it is emphasized in repeated studies that entangled cord may be untied.[7] But it is possible to meet with interesting examples about malign prognosis in case representations.[5,33] We observed in our study that cord entanglement did not affect fetus weight and prognoses of fetus and mother negatively.

When fetus presentation is examined, it is found that cord entanglement is frequently met in rump presentation.[34] We did not researched a relationship between fetus presentation and cord entanglement due to the fact that we included cases with vertex presentation into our study.

Cord entanglement was found slightly high in male fetuses.[21,31] We found that male fetus count was higher in group having cord entanglement but it was statically not significant.

We observed increase in the rates of interfered birth due to hardly processing labor in cases having cord entanglement at neck in our study. Not processing of labor in cases having cord entanglement at neck can be explained that cord prevents engagement of head to pelvis. In this case, cord at neck can be deemed within reasons of surmaturation. Researching existence of cord at neck by ultrasonography becomes important for inspecting third trimester of gestations in case of surmatura-

tion. As in our study, if there are cord entanglement and oligohydroamnios, interfered birth rate increases.

Conclusion

Cord entanglement at neck in the existence of oligohydroamnios significantly increases fetal distress development risk at labor and this condition increases the interfered birth rates. Rates of amnios fluid painted with meconium significantly increase in cases with cord entanglement; but this result does not affect perinatal mortality and staying of newborn in intensive care unit.

As a result of our study, it is found that perinatal outcomes are not different between groups having and not having cord entanglement at neck and there is no need to change birth administration of cases found cord, but labor should be observed closely due to the fact that fetal distress risk is increased in cases with oligohydroamnios.

References

1. Assimakopoulos E, zafrakas M, Garmiris P, Goulis DG, Athanasiadis AP, Dragoumis K, Bontis J. Nuchal cord detected by ultrasound at term is associated with mode of delivery and perinatal outcome. *Eur J Obstet Gynecol Reprod Biol* 2005; 1-5.
2. Birnholz JC. Ecologic physiology of the fetus: ultrasonography of supply-line deprivation syndromes. *Radiol Clin North Am* 1990; 28: 179-88.
3. Collins JH. Nuchal cord type A and type B. *Am J Obstet Gynecol* 1997; 177: 94.
4. Shui KP, Eastman NJ. Coiling of the umblical cord around the foetal neck. *J Obstet Gynaecol Br Emp* 1957; 64: 227-8.
5. McCaffrey LE, Arbor A. The umblical encircling the neck and its relation to intrapartum complications. *Am J Obstet Gynecol* 1927; 13: 104-8.
6. Larson JD, Rayburn WF, Harlan VL. Nuchal cord entanglements and gestational age. *Am J Perinatol* 1997; 14: 555-7.
7. Collins JH, Collins CL, Weckwerth SR, De Angelis L. Nuchal cords: timing of prenatal diagnosis and duration. *Am J Obstet Gynecol* 1995; 17: 768.
8. Rhoades DA, Latza U, Mueller BA. Risk factors and outcomes associated with nuchal cord. A population-based study. *J Reprod Med* 1999; 44: 39-45.
9. American College of Obstetricians and Gynecologists. Intrapartum fetal heart rate monitoring: guidelines for monitoring, terminology and instrumentation. ACOG Technical Bulletin 132. Washington, DC: ACOG; 1989.
10. Singer DB, Macpherson T. Fetal death and the macerated still born fetus. In Wigglesworth JS, Singer DB (ed). Textbook of fetal and perinatal pathology. Volume 1 Boston, Blackwell Scientific Publication 1991; 266-7.
11. Schaffer L, Burkhardt T, Zimmermann R, Kurmanavicius J. Nuchal cords in term and postterm deliveries-Do we need to know? *Am J Obstet Gynecol* 2005; 106: 23-8.
12. Peregrine E, O'Brien P, Jauniaux E. Ultrasound detection of nuchal cord prior to labor induction and the risk of cesarean section. *Ultrasound Obstet Gynecol* 2005; 25: 160-4.
13. Larson JD, Rayburn WF, Crosby S, Thurnau GR. Multiple nuchal cord entanglements and intrapartum complications. *Am J Obstet Gynecol* 1995; 173: 1228-31.
14. Sornes T. Umblical cord encirclements and Apgar scores. *Acta Obstet Gynecol Scand* 1998; 77: 313-6.
15. Jouppila P, Kirkinen P. Ultrasonic diagnosis of nuchal encirclement by the umblikal cord: a case and methodological report. *J Clin Ultrasound* 1982; 10: 59-62.
16. Schaefer M, Laurichesse-Delmas H, Ville Y. The effecet of nuchal ord on nuchal translucency measurement at 10-14 weeks. *Ultrasound Obstet Gynecol* 1998; 11: 271-3.
17. Hanaoka U, Yanagihara T, Tanaka H, hata T. Comparison of three-dimensional, two-dimensional and color Doppler ultrasound in predicting the presence of a nuchal cord at birth. *Ultrasound Obstet Gynecol* 2002; 19: 471-4.
18. Pilu G, Falco P, Guazzarini M, Sandri F, Bovicelli L. Sonographic demonstration of nuchal cord and abnormal umblical artery wavwform heralding fetal distress. *Ultrasound Obstet Gynecol* 1998; 12: 125-7.
19. Baz E, Zikulnig L, Hackeloer BJ, Hecher K. Abnormal ductus venosus blood flow: a clue to umblical cord complication. *Ultrasound Obstet Gynecol* 1999; 13: 204-6.
20. Collins JH. An association between plasental location and nuchal cord occurence. *Am J Obstet Gynecol* 1992; 167: 570-1.
21. Rhoades DA, Latza U, Mueller BA. Risk factors and outcomes associated with nuchal cord. A population-based study. *J Reprod Med* 1999; 44: 39-45.
22. Jauniaux E, Ramsey B, Peellaerts C, Scholler Y. Perinatal features of pregnancies complicated by nuchal cord. *Am J Perinatol* 1995; 12:255-8.
23. Flam BL. Tight nuchal cord and shoulder dystocia: a potentially catastrophic combination. *Obstet Gynecol* 1999; 94: 853.
24. Sornes T. Umblical cord encirclements and fetal growth restriction. *Obstet Gynecol* 1995; 86: 725-8.
25. Osak R, Webster KM, Bocking AD, Campbell MK, Richardson BS. Nuchal cord evident at birth impacts on fetal size relative to that of the placenta. *Early Hum Dev* 1997; 49: 193-202.
26. Katz ME, Bass WT, White LE. Dural sinus ectasia after prolonged nuchal cord encirclement. *J Ultrasound Med* 1992; 11: 289-92.
27. Verdel MJC, Exalto N. Tight nuchal coiling of the umblical cord causing fetal death. *J Clin Ultrasound* 1994; 22: 64-6.

28. Collins JH. Two cases of multiple umblical cord abnormalities resulting in stillbirth: prenatal observation with ultrasonography and fetal heart rates. *Am J Obstet Gynecol* 1993; 168: 125-7.
29. Nelson KB, Grether JK. Potentially asphyxiaing conditions and spastic cerebral palsy in infants of normal birth weight. *Am J Obstet Gynecol* 1998; 179: 507-13.
30. Greenwood C, Impey L. The association of nuchal ord with cerebral palsy is influenced by recording bias. *Early Hum Dev* 2002; 68: 15-9.
31. Adinma JIB. Effect of cord entanglement on pregnancy outcome. *Int J Gynecol Obstet* 1990; 32: 15-8.
32. Uludağ S, Madazlı R, Şen C, Ocak V. Boyunda kordon dolanmasının doğum eylemi üzerine etkisi. *Perinatoloji Dergisi* 1994; 2: 251-4.
33. Yalınkaya A, Demir B, Kılınç N, Yayla M. Umblikal kordonun fetus boynuna dolanması nedeniyle antenatal fetal kayıp. Olgu sunumu. *Perinatoloji Dergisi* 2003; 11: 49-51.
34. Giacomello F. Ultrasound determination of nuchal cord breech presentation. *Am J Obstet Gynecol* 1988; 159: 531-2.

Antenatal Education About Pregnancy, Delivery and Puerperium During Antenatal Care

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Abstract

Objective: Our purpose was to investigate the conditions of antenatal education about pregnancy, delivery and puerperium during antenatal care.

Methods: The study was planned as cross-sectionally and antenatal education was investigated in 420 women who had prenatal care and gave birth in last 2 years.

Results: Majority of women (82.1%) reported that they used different information resources for antenatal education. The ratio of using different information resources for antenatal education was higher in women who live in city, have high socioeconomic status, high educational level and social security. The ratio of women who had higher educational level (≥ 12 years) was higher in women who had used other information resources than that of not used (12.8% versus 2.7%, p = 0.00). Women were reported that they received better information on 'antenatal care', 'nutrition', and 'immunisation'. But antenatal education was inadequate in these subjects: 'exercise', 'sexual life', and 'chromosomal anomaly screening'. Information resources that were used most commonly were books, television, and friends.

Conclusion: Antenatal education is especially important in women who live in village, have low socioeconomic state, low educational level, have not social security and in housewifes. 'Chromosomal anomaly screening', 'sexual life' and 'exercise' are the subjects that pregnanat women are not informed enough and giving adequate information in these issues is important. Books and television are the most common used information sources and we should use them more effectively.

Keywords: Antenatal education, antenatal care, pregnancy.

Doğum öncesi bakım esnasında gebelik, doğum ve doğum sonrası döneme ilişkin bilgi edinme durumu

Amaç: Gebelerin doğum öncesi bakım (DÖB) esnasında gebelik, doğum, ve doğum sonrası dönem ile ilgili bilgi edinme durumlarının araştırılması.

Yöntem: Çalışma kesitsel planlı olup son iki yıl içinde doğum yapan ve DÖB alan 420 kadın ile yapılan görüşmede, gebelik esnasında, gebelik/doğum ile ilişkili bilgilenme durumu araştırıldı.

Bulgular: Kadınların %82.1'i muayene oldukları yerin dışındaki bir kaynaktan gebelik, doğum, doğum sonrası dönem ile ilgili bilgi aldıklarını bildirdi. Şehir merkezinde yaşayan, eğitim düzeyi yüksek, işte çalışan, sosyal güvencesi olan ve sosyoekonomik düzeyi yüksek olan kadınların DÖB esnasında, muayene olduğu yerin dışındaki bir kaynaktan bilgi edinme oranlarının daha yüksek olduğu saptandı. Başka kaynaktan bilgi alanlarda eğitim süresi 12 yıl ve üstünde olanların oranı %12.8 iken bilgi almayanlarda %2.7 oldu (p = 0.00). DÖB esnasında gebelere en çok bilgi verilen konular 'gebelik muayeneleri', 'gebelikte beslenme ve kilo alımı', 'aşı yaptırma' olurken en az bilgi verilen konular 'egzersiz', 'cinsel yaşam' ve 'kromozom anomali taraması' oldu. DÖB alınan yerin dışında gebelik, doğum, doğum sonrası dönem ile ilgili en sık bilgi alınan kaynaklar ise kitap/dergi, televizyon ve arkadaş/tanıdık oldu.

Sonuç: DÖB esnasında gebelik/doğum ile ilgili bilgilendirmenin öncelikli olarak yapılması gerekenler köy/kasabada yaşayan, sosyoekonomik düzeyi düşük olan, sosyal güvencesi olmayan, eğitim düzeyi düşük olan ve işte çalışmayan gebelerdir. DÖB esnasında yetersiz bilgilendirme yapılan konuların başında kromozom anomali taraması, cinsel yaşam, egzersiz gelmekte olup bu konularda gebelerin bilgilendirilmesine önem verilmelidir. Gebelerin en çok kullandığı bilgi kaynakları kitap/dergi ile televizyon olup toplumun eğitiminde bunlar etkili olarak kullanılmalıdır.

Anahtar Sözcükler: Doğum öncesi eğitim, doğum öncesi bakım, gebelik.

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Introduction

One of the important factors affecting the satisfaction of pregnant women with the antenatal care education they receive is good communication between the pregnant women and the health worker giving the antenatal care education.[1] Providing pregnant women with suitable and accessible information is one of the important factors in ensuring good communication.[2]

It has been stated that there is an increase of knowledge and adaptation in pregnant women continuing antenatal care education and that the ratio of starting formula with caesarean and before being discharged is low.[3] Turan and Say have stated that antenatal care education which is to be given to women experiencing their first pregnancy may have a positive effect on the man's contribution to family planning with the early start of breastfeeding and newborn follow-ups.[4] In response to this, there are also studies reporting that continuing antenatal care education have no positive contribution to antenatal care and feeling good about the self.[5,6]

The education which is to be provided for pregnant women during antenatal care may ensure positive contributions on the health of the mother and the baby such as receiving adequate antenatal care, the realization of the delivery under healthy conditions, the appropriate use of family planning methods, and the elimination of negativities in regards to baby care.

Antenatal education in our country is most often provided in the form of clinic education by the midwife/nurse or doctor whom the pregnant woman receives antenatal care. Educating with antenatal care education classes commonly used in developed countries is not done outside the limited number of centers. Similarly, education through booklets and brochures is also non-common.

This study was designed with the consideration that it would contribute to appropriate planning and programming in relation to educating pregnant women in our country, and with the object to investigate information regarding antenatal education about pregnancy, delivery and puerperium during antenatal care.

Methods

The study was planned cross-sectionally and the investigation included women who delivered within the last two years. The women included in the study and the Abant Izzet Baysal University were discussed at Izzet Baysal Faculty of Medicine, Department of Gynecology and Obstetrics; Izzet Baysal Obstetrics Hospital and Children's Health Hospital; Refika Baysal Mother Child Health and Family Planning Center, and Health Care Center between the first of August and 30th of December 2004. The discussions were realized by the investigation staff from our clinic. Women were asked questions regarding 'the state of education during antenatal care' taking place in a broad survey form related to antenatal care. The study group consisted of 420 cases in total.

Annual income in USD dollars, having social security, being a homeowner, being an automobile owner were used as criteria in the determination of the socioeconomic level. Those who had an annual income over 12.000 USD or between 6.000 to 12.000 USD and had two out of social security, house, automobile, or those who did not know what their annual income was and had social security, a house, and an automobile were included in the "high socioeconomic level" group. Those who have an annual income below 6.000 USD and had at the most one out of house, automobile or social security were included in the "low socioeconomic level" group, and the remaining cases were included in the "middle socioeconomic level" group.

Statistical evaluations were performed with the SPSS package program (version 11) by the transferal of survey data to the computer environment. Student t, Mann, Whitney U, X_2 and Fisher's exact X2 tests were used for the statistical evaluation. The significance limit was taken as $p < 0.005$.

Results

The average study group age is 26.5 ± 4.8, number of deliveries is 1.6 ± 0.8, average annual income is 5136.9 ± 4336.4, and other socioeconomic characteristics and some antenatal care related fundamental variables are given in Table 1. 82% of women have been stated to have received information regarding pregnancy, delivery and puerperium from a different source. Factors such as living in the city central, higher educational level, being employed, having social security and a high socioeconomic level were detected to have an impact on using information from a different source (Table 2). In response to this, using information regarding pregnancy, delivery and puerperium during antenatal care from a source other than the health unit from which antenatal care is received did not show any difference from that provided by the antenatal care doctor or midwife/ nurse.

Table 1. The main sociodemographic characteristics of the study group and some variables associated with antenatal care.

	Average ± standard divergence	Extreme values
Age	26.5 ± 4.8	17-41
Number of pregnancies	1.9 ± 1.2	1-10
Doğum Sayısı	1.6 ± 0.8	0-6
Number of deliveries	0.2 ± 0.6	0-7
Number of spontaneous abortions	0.1 ± 0.3	0-2
Number of children living	1.6 ± 0.8	1-5
Average annual income (USD)	5 136.9 ± 4 336.4	0-30 000
Month pregnancy follow-ups started	2.4 ± 1.4	1-9
Total number of check-ups	9.5 ± 4.2	1-30

USD: American Dollars

While the ratio of pregnant women with education of 12 years or more who used information from a different source was 12.8%, the ratio of those who did not was 2.7% (p = 0.00). The ratio of women working who reported to have used information from a source other than the health unit they received antenatal care when pregnant was higher than women who did not (6.7%) with 15.5% (p = 0.05). It was detected that the ratios of living in the city (60.6% against 41.3%, p = 0.00), having a high socioeconomic status (22.3% against 12.0%, p = 0.06), and having social security (91.3% against 84.0%, p = 0.05) was higher in women who reported to have used information from a different source.

While the subjects which pregnant women were given information most often on at the health unit which they received antenatal care and their ratios were 'pregnancy check-ups (82.6%), 'diet and weight gain during pregnancy (80.0%)', 'getting vaccinations (70.2%)', the subjects in which the least information was given were 'exercise (39.5%)', 'sexual life

Table 2. The sociodemographic characteristics of pregnant women who used a difference source of information about pregnancy, delivery and puerperium.

	Receiving information about pregnancy	
	Yes	No
Place of residence (420 cases, x2 = 12.17, p = 0.00)		
Province	209 (%60.6)	31 (%41.3)
Town	44 (%12.8)	9 (%12.0)
Village	92 (%26.7)	35 (%46.7)
Socioeconomic level (420 cases, x^2 = 5.60, p = 0.06)		
Low	108 (%31.3)	32 (%42.7)
Medium	160 (%46.4)	34 (%45.3)
High	77 (%22.3)	9 (%12.0)
Social security (420 cases, x^2 = 3.65, p = 0.05)		
Yes	315 (%91.3)	63 (%84.0)
No	30 (%8.7)	12 (%16.0)
Term of education (420 cases, x^2 = 20.88, p = 0.00)		
0-5 years	178 (%51.6)	60 (%80.0)
6-11 years	123 (%35.7)	13 (17.3)
12 years and above	44 (%12.8)	2 (%2.7)
State of being employed (420 cases, x^2 = 3.71, p = 0.05)		
Housewife	293 (%84.9)	70 (%93.3)
Employed	52 (%15.1)	5 (%6.7)
The person providing the most frequent antenatal care (420 cases, x^2 = 0.09, p = 0.77)		
Midwife/nurse	109 (%31.6)	25 (%33.3)
Doctor	236 (%68.4)	50 (%66.7)

Table 3. The ratios of education on various subjects about pregnancy, delivery and puerperium during antenatal care.

The ratios of education during antenatal care	(%)
Pregnancy check-ups	347 (%82.6)
Diet and weight gain during pregnancy	336 (%80.0)
Getting vaccination	295 (%70.2)
Lactation	267 (%63.6)
Common illnesses during pregnancy (nausea, constipation, etc)	261 (%62.1)
Delivery	223 (%53.1)
Signs of danger during pregnancy (pain, bleeding, etc)	213 (%50.7)
Puerperium care	201 (%47.9)
Family planning	171 (%40.7)
Exercise	166 (%39.5)
Sexual life	165 (%39.3)
Chromosomal anomaly screening	112 (%26.7)

Table 4. The ratio of pregnant women feeling the need to be educated on various subjects about pregnancy, delivery and puerperium during antenatal care.

The ratio of pregnant women feeling the need to be educated during antenatal care	(%)*
Diet	185 (%44.0)
Signs of danger during pregnancy (pain, bleeding, etc)	144 (%34.3)
Delivery	136 (%32.4)
Check-up frequency and time	124 (%29.5)
Lactation	114 (%27.1)
Sexuality	112 (%26.7)
Daily activities	67 (%16.0)
Being employed	54 (%12.9)

*The total of the percentages is over 100% since pregnant women use more than one source.

Table 5. The other sources used to gain information about delivery and puerperium during antenatal care.

The other sources used to gain information	(%)*
Books/magazines	227 (%54.0)
Television	168 (%40.0)
Friend/acquaintance	94 (%22.4)
Radio	32 (%7.6)
Internet	20 (%4.8)
Other (newspaper, brochure, etc)	17 (%4.0)

*The total of the percentages is over 100% since pregnant women use more than one source.

(39.3%)', and 'chromosomal anomaly screening (26.7%)' (Table 3). 65.5% of women reported that they felt the need to acquire information from other sources regarding antenatal education about pregnancy, delivery and puerperium during their pregnancy. The subjects which they felt the need to receive the most information during pregnancy and their ratios were 'diet (44.0%)', 'signs of danger during pregnancy (%34.3)', and 'delivery (32.4%)' (Table 4). The other sources most commonly used for information regarding antenatal education about pregnancy, delivery and puerperium during antenatal care were books/magazines (54%), television (40%), and friends/acquaintances (%22.4). In response to this, it was determined that other sources such as radio, internet, newspaper and brochures were not used much for this purpose (Table 5).

Discussion

It was detected that women felt the need to receive an important ratio of information during antenatal care and that they referred to sources other than clinic education to receive information. The ratio of women who reported that they used information from other sources regarding pregnancy, delivery and puerperium was found to be 82.1%, and the ratio of those who felt the need to be educated was found to be 65.5%. These results show that clinic education provided by the midwife/nurse or doctor giving antenatal care was inadequate, and that pregnant women felt the need to be educated and they tried to ensure this through other sources. In the study which was performed by Karatas[7] with the objective to examine the efficiency of the prenatal care and education provided by the nurse with the group education method, it was shown that women lacked knowledge regarding the health of the mother and the child and by proving that they want to be educated, that it is possible to ensure a significant increase in their level of knowledge by providing continuous education in direction to the needs. It was detected that women who used information from different sources during pregnancy had a high level of education, and that the ratios of having a high socioeconomic level, living in the city, having social security and being employed was higher. We consider that the woman's level of education is the most important of these factors. As women's level of education increases, their possibility of being employed increases, consequently, the possibilities of having social security, living in the city, being of a high socioeconomic status increase.

It seems that the place antenatal care is receive or from who it is received does not significantly affect the pregnant woman's state of being educated. It was observed that women who stated that

antenatal care is most frequently received from the midwife/nurse, secondly received antenatal care from the doctor. Therefore, in order to investigate whether there is a difference in the ratio and content of education given to pregnant women during antenatal care in comparison to receiving antenatal care from the doctor or the nurse, it will be appropriate to compare pregnant women who received antenatal care only from the doctor or the nurse.

While the subjects which pregnant women were given information most often on at the health unit which they received antenatal care and their ratios were 'pregnancy check-ups (82.6%)', 'diet and weight gain during pregnancy (80.0%)', 'getting vaccinations (70.2%)', the subjects in which the least information was given were 'exercise (39.5%)', 'sexual life (39.3%)', and 'chromosomal anomaly screening (26.7%)'. In the study in which they interviewed 151 puerperants after delivery, Ozbasaran and Yanikkerem,[8] have reported that the subjects in which pregnant women received the most education during antenatal care was diet and tetanus vaccination. Education about chromosomal anomaly screening done during antenatal care is of special importance. This is because it is possible for the pregnant woman to give informed consent consciously regarding invasive approach for screening tests and/or exact diagnosis only by having adequate knowledge. It was stated that 32%-40% of pregnant women felt that they did not receive adequate information regarding the benefits and risks of various screening tests.[9] It was stated that education on antenatal screening tests is inadequate for informed consent, that it is at times wrong or misleading,[10] that this situation may be due to the lack of knowledge of the person giving antenatal care, their lack of education on how to communicate information in a conceivable way, or the lack of sufficient time and resources for education.[11-13] In order to provide efficient use of antenatal screening tests in our country, in order to provide efficient contribution to the process of the decision making of families, it is important to provide adequate education for pregnant women regarding the subject.

In the study, 65.5% of women reported that they felt the need to acquire extra information during their pregnancy and the subjects which they felt the need to receive the most information were 'diet (44.0%)', 'signs of danger during pregnancy (%34.3)', and 'delivery (32.4%)'. It was reported in a study that the most important objective of the education given during antenatal care was to ensure self-confidence in women for delivery and baby care.[14] It was reported that the subjects which pregnant women were most interested in during antenatal education were physical and psychological changes linked to pregnancy, fetal development, the act of giving birth, delivery and baby care.[15] A pregnant woman who is aware of the danger signs in pregnancy will contact a health institute on time at the circumstance of risky situations, and when they have adequate knowledge on delivery, they will want to realize delivery in a place with the appropriate conditions. The pregnant woman contacting a health institute on time at the circumstance of risk, and the delivery taking place in healthy conditions, the decrease in mortality being primary, it may provide remedial contributions to the health of the mother and baby.

The other sources most commonly used for information regarding antenatal education about pregnancy, delivery and puerperium during antenatal care were books/magazines (54%), television (40%), and friends/acquaintances (%22.4). In response to this, it was determined that other sources such as radio, internet, newspaper and brochures were not used much for this purpose. In a study, 65 midwives and 100 randomly selected pregnant women were interviewed.[16] During the first check-up, in this study which antenatal education is provided, only 33% of pregnant women have reported that they were able to follow the recommendations given to them during the education by midwives, without the aid of written or visual tools. In the conclusion of the study, it was stated that giving information is not the most appropriate method of educating in the education of pregnant women, and that other methods such as mass communication media and brochures need to be used more often than usual.

Education through antenatal education classes is not common in our country, and there have been no women in the study who stated that they received any information in the said way. In their study, Turan and Say4 have reported that the early start of antenatal lactation and baby check-ups and participation in family planning applications may be beneficial in women experiencing their first pregnancy. In a study which reports the frequency of continuing antenatal education classes as 23%, the ratio of a caesarean section and the ratio of starting formula before being discharged from the hospital was found to be lower in women who continued antenatal education, and that antenatal

education increased the knowledge and adaptation of women.[3] The popularization of antenatal education plays an important role in the enabling of pregnant women to access reliable and uniform information about pregnancy, delivery and puerperium in our country. Antenatal education should not be considered a luxury, the necessary arrangements should be made to start antenatal education implementations at regular intervals especially at health institutes with an annual delivery rate over a specific number.

In conclusion, two out of every three pregnant women in the study feels the need to be educated about pregnancy, delivery and puerperium during antenatal care, and four out of every five pregnant women try to gain information from a different source. The factors of using a different source are living in the city, having high socioeconomic status, having a high level of education, being employed, and having social security. Therefore, those who primarily need to be given antenatal education are pregnant women living in the rural areas, having a low socioeconomic status, and who are unemployed. Chromosomal anomaly screening, sexual life, exercise being the main subjects in which education is inadequate during antenatal education, importance must be attached to educating pregnant women on the said subjects. The sources of information most often preferred in antenatal education are books/magazines, And these resources should be used effectively in public education.

References

1. Garcia J, Redshaw M, Fitzsimons B, Kene J. First Class Delivery. A National Survey of Women's Views of Maternity Care. London: Audit Commission, 1998.
2. Department of Health Changing childbirth. Part I. Report of the Expert Maternity Group (Chair: Baroness Cumberlege). London: HMSO 1993.
3. Spinelli A, Baglio G, Donati S, Grandolfo ME, Osborn J. Do antenatal classes benefit the mother and her baby. *J Matern Fetal Neonatal Med* 2003; 13(2): 94-101.
4. Turan JM, Say L. Community –based antenatal education in İstanbul, Turkey: effects on health behaviors. *Health Plan* 2003; 18(4): 391-398.
5. Lumley J, Brown S. Attenders and nonattenders at childbirth education classes in Australia: how do they and their births differ? *Birth* 1993; 20(3): 123-130.
6. Fabian HM, Radestad IJ; Waldenström U. Childbirth and parethood education classes in Sweden. Women's opinion and possible outcomes. *Acta Obstet Gynecol Scand* 2005; 84(5): 436-443.
7. Karataş B. Hemşire tarafından verilen doğum öncesi bakım hizmeti ve eğitiminin etkinliğinin incelenmesi. *Optimal Tıp Dergisi* 2001; 14: 47-50.
8. Özbaşaran F, Yanıkkerem E. Doğum yapan kadınların doğum öncesi bakım alma durumlarının değerlendirilmesi. *Sendrom Aylık Aktüel Tıp Dergisi* 2004; 16: 50-56.
9. Audit Commission for Local Authorities, NHS in England and Wales. First Class delivery: improving maternity services in England and Wales. London: Audit Commission Publications; 1997. p. 1-98.
10. Marteau TM, Slack J, Kidd J, Shaw RW. Presenting a routine screening test in antenatal care: practice observed. *Public Health* 1992; 106: 131-41.
11. Smith D, Shaw RW, Marteau TM. Lack of knowledge in health professionals: a barrier to providing information to patients. *Qual Health Care* 1994; 3: 75-8.
12. Smith D, Shaw RW, Slack J, Marteau TM. Training obstetricians and midwives to present screening tests: evaluation of two brief interventions. *Prenat Diagn* 1995; 15: 317-24.
13. Green JM. Serum screening for Down's syndrome: experiences of obstetricians in England and Wales. *BMJ* 1994; 309: 769-72.
14. Nolan MI, Hicks C. Aims, processes and problems of antenatal education as identified by three groups of childbirth teachers. *Midwifery* 1997; 13: 179-88.
15. Sullivan P. Felt learning needs of pregnant women. *Can Nurse* 1993; 89: 42.
16. Murira N, Munjanja SP, Zhanda I, Lindmark G, Nystrom L. Health education for pregnancy care in Harare. A survey in seven primary health care clinics. *Cent Afr J Med* 1996; 42: 297-301.

Heterotopic Pregnancy: Tubal Ectopic Pregnancy And Monochorionic Monoamniotic Twin Pregnancy: A Case Report

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Abstract

Background: Heterotopic pregnancy, simultaneous presence of intrauterine and extrauterine pregnancies is a very rare condition. In recent years, however, the widespread use of assisted reproductive technologies has dramatically increased the incidence of this condition. Early diagnosis of heterotopic pregnancy is important to decrease mortality and morbidity and to preserve future fertility.

Case: This report describes a 35-year-old female at 10 weeks' gestation with an intrauterine monochorionic monoamniotic twin pregnancy after ovulation stimulation with clomiphene citrate and intrauterine insemination who presented complaining of left lower quadrant abdominal pain. After physical and transvaginal ultrasonographic examinations monochorionic monoamniotic twin pregnancy and intra abdominal bleeding was diagnosed which led us to the decision of performing a emergency laparotomy. The right fallopian tube was found to be ruptured due to extrauterine pregnancy localized in the ampullary region and right salpingectomy was performed.

Conclusion: Heterotopic pregnancy must be considered in the differential diagnosis of abdominal pain in the fist trimester, especially in patients who conceived by means of assisted reproductive technology.

Keywords: Heterotopic pregnancy, twin pregnancy.

Monokoryonik monoamniotik ikiz gebelikle birlikte görülen heterotopik gebelik olgusu

Amaç: Heterotopik gebelik, intrauterin ve ekstrauterin gebeliğin birlikte bulunduğu, özellikle risk faktörleri yoksa oldukça nadir rastlanan bir durumdur. Son yıllarda yardımla üreme teknolojilerindeki gelişme sonucu heterotopik gebelik insidansında artış meydana gelmiştir. Heterotopik gebeliklerin erken tanı ve uygun tedavisi mortalite, morbidite ve gelecekteki fertilite açısından önemlidir.

Olgu: Klomifen sitrat ile ovulasyon indüksiyonu sonrası yapılan IUI uygulaması ile gebe kalan hasta, ani başlayan kasık ağrısı şikayeti ile müracaat etti. Muayene ve transvajinal ultrasonografi ile değerlendirime sonucunda monokoryonik monoamniotik ikiz gebelik ve batın içine kanama ile uyumlu bulgular saptandı. Acil olarak opere edilen hastada rüptüre sağ ektopik gebelik saptandı ve sağ salpenjektomi operasyonu uygulandı. Halen onaltıncı gebelik haftasında monokoryonik monoamniotik ikiz gebelik sağlıklı olarak devam etmektedir.

Sonuç: Özellikle yardımla üreme teknikleri sonucu oluşan gebeliklerde birinci trimesterde karın ağrısı şikayeti ile başvuran hastaların ayırıcı tanısında heterotopik gebelik de akılda tutulmalı ve zamanında uygun şekilde tedavi edilmelidir.

Anahtar Sözcükler: Heterotopik gebelik, ikiz gebelik.

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Background

Heterotopic pregnancy is the name of simultaneous presence of intrauterine and extrauterine pregnancies and seen in at 1/30000 to 1/7963 of all pregnancies.[1] It is first defined by Duverney in the year of 1708, as an autopsy finding in a patient died because of ectopic pregnancy and also simultaneously having intrauterine pregnancy.[1] However, its incidence is increasing in women having past pelvic inflammatory disease, tubal surgery, ectopic pregnancy history and women conceived with assisted reproductive techniques (ART) and incidence raises up to 1/100.[2] There is heterotopic pregnancy cases seen with intrauterine twin pregnancy defined at the end of first trimester in literature.[3] Here a tubal heterotopic pregnancy case seen with intrauterine monochorionic monoamniotic twin pregnancy conceived with an application of intrauterine insemination (IUI) made after ovulation induction with clomiphene citrate (CC) is reviewed.

Case

The patient (35 age, gravida: 0, parity: 0) who had pre-diagnose of infertility due to male mate had ovulation induction with CC and subsequently IUI applied to our clinic for routine antenatal examination at eighth week of the pregnancy for the first time. After resulting of physical examination and ultrasonographic evaluation, monochorionic monoamniotic twin pregnancy is determined and antenatal routine tests are prompted. In the patient applying to our clinic after two weeks with inguinal pain acute abdominal findings and in transvaginal ultrasonography monochorionic monoamniotic double vital fetus inside the smooth contoured regular single gestational sac, hyperecogenic solid mass in size 30x45 mm at the right adnexial region and findings related to intraabdominal bleeding observed and withthat decided for operation. In laparotomy finding compatible with ruptured ectopic pregnancy is determined at right tubal ampullar region (Figure 1). Right salphengectomy is performed in patient and taken to her bed. It is reported tubal ectopic pregnancy in pathology report. At the same day, after operation it is observed that both fetuses are vital by ultrasonography. No complication occurred and the patient discharged in third day after operation with cure to come back for routine pregnancy controls. The patient is still in 16th gestational week and her pregnancy is lasting without any problem.

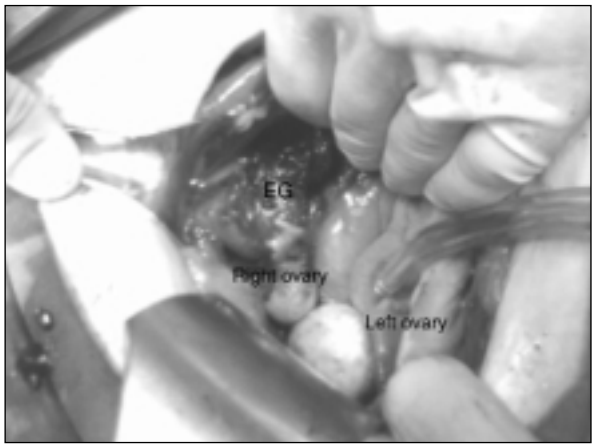

Figure 1. Intraoperative viewing of heterotopic pregnancy at right tuba. (**EG:** ectopic pregnancy).

Discussion

While spontaneous ectopic pregnancy is seen in 1-2% of all of the pregnancies,[4] it is seen as 5% of the pregnancies after AST.[2] Risk factors increasing the frequency of ectopic pregnancy are, past pelvic inflammatory disease (PID), intrauterine device (IUD), assisted reproductive techniques, endometriosis, past abdominal surgery, tubal surgery and sexually transmitted diseases and these risk factors seem similar to the heterotopic pregnancies. The accused mechanism in ectopic and heterotopic pregnancies especially seen after ART is immigration of transferred embryo to damaged tuba and unrejection from tuba by peristaltism.[1,5]

Early diagnose of heterotopic pregnancy is hard because of insufficient clinic symptoms. Reece et al[1] defined four widespread symptoms and findings. These are; abdominal pain, adnexial mass, peritoneal irritation and increasing in the size of uterus. While Tal et al[2] reported abdominal pain in 83% and abdominal tenderness with hipovolemic shock in 13% of the heterotopic pregnancy cases also reported vaginal bleeding in

half of the patients. Finding of vaginal bleeding that can be coincided in ectopic pregnancies is rarely seen in hetrotopic pregnancies because of intact endometrium of intrauterin pregnancy.[6] In our case too no clinical finding is seen until developing of tubal rupture related to heterotopic pregnancy but, patient applied to our clinic with peritoneal irritation findings occurring because of intraabdominal bleeding as a conclusion of rupture.

The most important diagnose method in diagnosing heterotopic pregnancy is high-resolution transvaginal ulrasonography. In high risk patients, especially the ones that ART is applied 4-6 weeks after embryo transfer it is offered to make ultrasonographic evaluation for diagnose of both intrauterine pregnancy and for differential diagnose of ectopic and heterotopic pregnancy routinely.[7] But, especially the diagnose of heterotopic pregnancy is very hard even with ultrasonography and only 10% of cases can be diagnosed in preoperative period and it is known that sensitivity of sonography is only 56 %.[8] In our case too, routine antenatal physical examination was made before 2 weeks of her admittance to our clinic with acute table, intrauterine monoamniotic, monochorionic pregnancy was determined but did not find any finding compatible with heterotopic pregnancy.

Intrauterine pregnancy diagnose with ultrasonography, is very easy if it is made by an experienced physician. But, in ectopic pregnancies monitoring of gestational sac at adnexial region or fetal cardiac activity is a rarely seen finding.[7,8] Furthermore, determining of intrauterine pregnancy does not frequently bring to mind the ectopic pregnancy and heterotopic pregnancy diagnose can be missed. For this reason, especially in the presence of intrauterine pregnancy more than one, it must be considered that there can be an ectopic pregnancy simultaneously and to make differentional diagnose adnexial regions must examined with ultrasonography carefully. In pregnancies developing especially after ART probability of heterotopic pregnancy increases and even if these pregnancies are evaluated with ultrasonography, its diagnose is very hard in early period. In the differential diagnosis of the patients admitting with the complaint of abdominal pain and especially the ones having acute abdomen and peritoneal irritation findings in first trimester heterotopic pregnancy must not be forgetted. Because, majority of heterotopic pregnancies, also as in our case, are diagnosed in emergency laparotomy performed after it came symptomatic.

Although majority of heterotopic pregnancies case is placed at tubae, abdominal, cervical, cornual and ovarian heterotopic pregnancies are also reported,[9] even bilateral tubal heterotopic pregnancy with intrauterine pregnancy is presented.[10] For this reason, if suspected from heterotopic pregnancy it is required to evaluate fallopian tubes bilaterally, abdomen and pelvis before surgery.

Generally it is not easy to differentiate anembryonic adnexial ectopic pregnancy from hemorrhagic corpus luteum cyst in ultrasonography. Morphologic ultrasonography findings help in differentional diagnose. These are; seeing a loop around the gestational sac in 2-6 mm thickness, following of trophoblastic invasion into wall of tuba and typically, following of echogenity at around of the ovarian tissue which is more intense than the echogenity rounding corpus luteum.[9] Monitorization of both intrauterine and extrauterine cardiac activity in ultrasonography helps in diagnose but, it is a rarely determined finding. Additionally fetal cardiac activity beginnings can be at different times. Hirch et al[11] reported intrauterine fetal cardiac activity observed 6 days after the extrauterine cardiac activity. Tal et al[2] reported that 70% of heterotopic pregnancies are diagnosed at 5-8th week of pregnancy, 20% of them at 9-10th week and 10% after 11th week.

As intrauterine pregnancy can go on without problem in heterotopic pregnancies, sometimes ectopic pregnancy forms hematoma itself and causes deterioration of the pregnancy in a way. As told here, a heterotopic pregnancy case is reported which the intrauterine pregnancy resulted with missed abortus.[12]

In diagnose and following of heterotopic pregnancies, it is thinkable that β-hCG and progesteron levels can be useful beside the ultrasonography. But, placental excessive production of β-hCG in intrauterin pregnancy can cause a

false in diagnosing the heterotopic pregnancy by masking subnormal β-hCG production that is produced in ectopic pregnancy. Because of this reason, serial β-hCG following is not useful in heterotopic pregnancies.[9]

There is not a standart follow method for heterotopic pregnancy because it is a rare event. Generally, there is a thought that laparoscopy is the most successful method in diagnose and treatment of heterotopic pregnancy.[3,13] But, there are also publications that reports laparotomy is more successful.[1,2] Even it carries surgical and anesthetic risks both for mother and fetus, surgical approach is fundamental especially in acute cases. In laparotomy requiring acute cases, operation must be ended with minimal trauma and minimal anaesthesia for continuation of healthy intrauterine pregnancy. Error or delay in diagnose leads to increase in mortality, major blood losses and on the same time conservative tubal surgery can not be done in tubal heterotopic pregnancies.[3,14] Although it is reported that more than 40% of intrauterine vital pregnancies are resulted with loss after surgery,[15] there are also publications reporting that pregnancy is not deteriorated and continued healthly and resulted with healthy deliveries.[2] In the literature other treatment methods are described except surgical treatment. In studies including a few cases some methods are reported like ultrasonography guided local methotrexate, an antiprogestine called RU 486 (mifepriston), injection of prostaglandins or potassium chloride and also aspiration of heterotopic pregnancy via transvaginal tract.[16] But, generally methotrexate, RU 486 and prostaglandins are not used because of their teratogen effects on intrauterine pregnancy.[9] For that reason in cases suspected from diffuse hemoperitoneum and in conditions that patient's hemodynamie impaired laparotomy must be considered primarily. Besides this in patients with stable hemodynamie and suspected heterotopic pregnancy, laparoscopy made for diagnose and treatment is a confidential method.[3,13] In our case intraabdominal bleeding is determined and patient is treated with laparotomy performed in emergency conditions, tubal surgery could not made because tubal damage was severe relating to tubal rupture and it is needed to perform salphingectomy. Early diagnose of heterotopic pregnancies carries great importance about patient's mortality, morbidity, continuination of a healthy intrauterine pregnancy and patient's future fertility. In such cases maternal mortality is 1% and intrauterine fetus mortality rate is 45-65%.[17] In the year of 1970 Smith and Siddique reported that 35-54% of intrauterine pregnancies after heterotropic pregnancy are ended in a healthy way.[18] In recent years, in followings of more than 150 cases reported as heterotropic pregnancy after surgery, it is reported that approximately 66% of intrauterine pregnancies are resulted with live deliveries.[2] This progress is related to developing in diagnose and treatment and also especially to the frequent follow of patients taking infertility treatment. In our case too, although intrauterine pregnancy is monochorionic-monoamniotic pregnancy is going on healthy in 16th gestational week.

Conclusion

In recent years, it is seen an increase in heterotopic pregnancy incidence as parallel to increase in ART and early diagnose and treatment of these patients came into prominence. In first trimester pregnancies, especially in ART used pregnancies, patients applying with inguinal pain and peritoneal irritation findings, even if normal pregnancy is followed heterotopic pregnancy must be considered in differential diagnosis. In diagnose transvaginal ultrasonography takes an important place but, it is not an accurately confidential method. Early diagnosing and proper treatment are very important about patient's mortality, morbidity, healthy continuation of intrauterine pregnancy and especially preserving of future fertility. The most frequently used methods in diagnose and treatment of these pregnancies are laparoscopy and laparotomy in proper cases.

References

1. Reece EA, Petrie RH, Sirmans MF, Finster M, Todd WD. Combined intrauterine and extrauterine gestations: a rewiev. *Am J Obstet Gynecol* 1983; 146: 323-30.
2. Tal J, Haddad S, Gordon N, Timor-Tritsch I. Heterotopic pregnancy after ovulation induction and assisted reproductive Technologies: a literature review from 1971 to 1993. *Fertil Steril* 1996; 66:1-12.
3. Alex JC, Anthony BR, Brian L, Pamela GG. Triplet heterotopic pregnancy after gonadotropin stimulation and intrauterine insemination diagnosed at laparoscopy: A case report. *South Med J* 2005; 98: 833-5.

4. Saraiya M, Berg CJ, Shulman H, Green CA, Atrash HK. Estimates of the annual number of clinically recognized pregnancies in the United States, 1981-1991. *Am J Epidemiol* 1999; 149: 1025-9.
5. Oliveria FG, Abdelmassih V, Abdelmassih Oliviera S, Abdelmassih R, Nagy ZP. Heterotopic triplet pregnancy: report and video of a case of a ruptured tubal implantation with living embryo concurrent with an intrauterine twin gestation. *Reprod Biomed Online* 2002; 5: 313-6.
6. Jacobson A, Galen D. Heterotopic pregnancies and IVF. *Fertil Steril* 1990; 54: 179-80.
7. Guirgis RR, Craft IL. Ectopic pregnancy resulting from GIFT and IVF: Role of ultrasonography in diagnosis and treatment. *J Reprod Med* 1991; 36: 793-6.
8. Ankum WM, Van der Veen F, et al. Transvaginal sonography and human chorionic gonadotrophin measurements in suspected ectopic pregnancy: a detailed analysis of a diagnostic approach. *Hum Reprod* 1993; 8: 1307-11.
9. Michael V, Christodoulos A, Grigorios H, Nikolaos A. Heterotopic pregnancy in a natural conception cycle presenting with tubal rupture: a case report and review of the literature. *Eur J Obstet Gynecol Reprod Biol* 2003; 106: 79-82.
10. Hun-Shan P, Jesse Chuang, Su-Fang C, Bih-Chwen H, Yu-Hung L, Yieh-Loong T, Shih-Chia H, et al. Heterotopic triplet pregnancy: report af a case with bilateral tubal pregnancy and an intrauterine pregnancy. *Hum Reprod* 2002; 17: 1363-6.
11. Hirsch E, Cohen L, Hecht BL. Heterotopic pregnancy with discordant ultrasonic appearance of fetal cardiac activity. *Obstet Gynecol* 1992; 79: 824-5.
12. Çepni İ, Öçal P, Benian A, İdil M. Yardımla üreme teknikleri ve heterotopik gebelik; bilateral tubal ve intrauterin gebelik. *Perinatoloji Dergisi* 2004; 12: 50-3.
13. Louis SC, Morice P, Chapron C, Dubuisson JB. The role of laparoscopy in the diagnosis and management of heterotopic pregnancies. *Hum Reprod* 1997; 12: 1100-2.
14. Bhargav MM, Sanjeeve B, Ralph S, Satnley AS, Bryan RT. Heterotopic pregnancy presenting as an acute abdomen: a diagnostic masquerader. *Am Surg* 2000; 66: 307-8.
15. Oehninger S, Kreiner D, Bass MJ. Abdominal pregnancy after in vitro fertilization and embryo transfer. *Obstet Gynecol* 1988; 72: 499-502.
16. Fernandez H, Lelaidier C, et al. Nonsurgical treatment of heterotopic pregnancy: a report of six cases. *Fertil Steril* 1993; 60: 428-32.
17. Schenker J, Ezra Y. Complications of assisted reproductive techniques. *Fertil Steril* 1994; 61: 411-22.
18. Smith DJH, Siddique FH. A case of heterotopic pregnency. *Am J Obstet Gynecol* 1970; 108: 1289-90.

PERINATAL JOURNAL

Volume 14 / Issue 2 / 2006

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