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Original research articles base on clinical or experimental studies. The main text should not exceed 2500 words (max. 16 pages) and there should be a maximum 6 authors

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Technical notes aims to present a newly diagnostic or therapeutic method. They should not exceed 2000 words (max. 8 pages) and include a maximum of 10 references.

Letters to the Editor should be no more than 500 words long (max. 2 pages) and include a maximum of 10 references.

Sections in the Manuscripts

Manuscripts should be designed in the following order: title page, abstract, main text, references, and tables, with each typeset on a separate page:

Page 1 - Title page
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Next Page - References
Next Page - Table heading and tables (each table should be placed in separate pages)
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This page should only include the title of the manuscript, which should be carefully chosen to better reflect the contents of the study. No anusual abbreviations should be used in the title of the manuscript. A short title as running heading not exceeding 40 characters should be given which is desired to appear on top part of continuing pages when journal is published.

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The sections in main text are defined according to the manuscript type.

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The Introduction section should include a brief summary of the base of the work and clearly states the purpose of the study.

The Methods section should contain a detailed description of the material, the study design and clinical and laboratory tests, and statistical methods used. A statement regarding the ethical issues should also be given in this section.

The Results section should provide the main findings of the study. Data should be concisely presented, preferably in tables or graphs.

The Discussion section should mainly rely on the results derived from the study, with relevant citations from the most recent literature.

The Conclusion section should briefly and claearly present the conclusions derived from the results of the study. It should be in compliance with the aim of the work and and point out its application in clinical practice.

— In ***Case Reports,*** main text should be divided with the titles "Introduction, Case(s), Discussion". Reported case(s) should be introduced clearly including the case story, and the results of laboratory tests should be given in table format as far as possible.

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— The text of the ***technical note*** type of articles should be divided into "Introduction, Technic, Discussion". The presented technic should be defined briefly under the related title, and include illustrations or figures as soon as possible.

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References

References used in the text should be directly related to the topic, as recent as possible and in enough numbers. They should be numbered in square brackets in the order in which they are mentioned in the text including Tables and Figures. Citation order should be checked carefully.

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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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Submission

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The following list will be useful during the final check of a manuscript before submission:

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Contents

Evaluation of Hemoglobin and Platelet Levels in Mild, Moderate and Severe Preeclampsia

Yaprak Engin Üstün, Kezban Doğan, Ilgın Türkçüoğlu, Yusuf Üstün, Mehmet Mutlu Meydanlı, Ayşe Kafkaslı

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Abstract

Objective: The aim of this study is to find out the relationship between the hemoglobin and platelet levels and the severity of preeclampsia.

Methods: One hundred and twenty seven cases of mild preeclampsia, 96 cases of moderate preeclampsia and 71 cases of severe preeclampsia diagnosed in our clinic between the years January 2004 and August 2007 were evaluated retrospectively. One hundred and eight healthy pregnant women with similar demographic features and gestational age and without the diagnosis of preeclampsia, gestational or chronic hypertension and proteinuria were included in the study as the control group. The age, gravida, parity, gestational age, hemoglobin and platelet levels, 1st and 5th minute Apgar score of the newborn and birth weight of cases were compared. Variance analysis was used for four group comparisons.

Results: The demographic characteristics of the cases evaluated in the study were similar. There was no difference between four groups for the hemoglobin levels (control group: 11.7±1.7, mild preeclampsia: 11.9±1.5, moderate preeclampsia: 12.1±1.6, severe preeclampsia: 12.2±1.7). The mean platelet level in the severe preeclampsia group was found to be lower than the other groups.

Conclusion: We found a relationship between platelet levels and the severity of preeclampsia.

Keywords: Preeclampsia, pathogenesis, platelet.

Hafif, orta ve şiddetli preeklampsi olgularında hemoglobin ve trombosit düzeylerinin karşılaştırılması

Amaç: Çalışmanın amacı, preeklampsi şiddetiyle, hemoglobin ve trombosit düzeyleri arasındaki ilişkinin araştırılmasıdır.

Yöntem: Kliniğimizde Ocak 2004-Ağustos 2007 yılları arasında tanı almış 127 hafif preeklampsi, 96 orta şiddette preeklampsi, 71 şiddetli preeklampsi olgusu geriye dönük olarak incelendi. Benzer demografik özellik ve gebelik haftasına sahip, preeklampsi, gebelik hipertansiyonu ya da kronik hipertansiyon ve proteinüri tanısı almamış 108 sağlıklı gebe kontrol grubu olarak çalışmaya dahil edildi. Olguların yaşı, gravida ve paritesi, gebelik haftaları, hemoglobin, trombosit düzeyleri, yenidoğanın 1. ve 5. dakika Apgar skorları ve doğum ağırlıkları karşılaştırıldı. Dört grup karşılaştırmalarında varyans analizi kullanıldı.

Bulgular: Çalışmaya dahil edilen olguların demografik özellikleri benzerdi. Hemoglobin düzeyleri açısından dört grup arasında farklılık saptanmadı (kontrol grubu: 11.7±1.7, hafif preeklampsi: 11.9±1.5, orta preeklampsi: 12.1±1.6, şiddetli preeklampsi: 12.2±1.7). Ağır preeklampsi grubunun ortalama trombosit düzeyleri diğer gruplara göre düşük bulundu.

Sonuç: Trombosit düzeylerinin preeklampsi şiddetiyle ilişkisi bulunmaktadır.

Anahtar Sözcükler: Preeklampsi, patogenez, trombosit.

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Introduction

Preeclampsia is a syndrome characterized by hypertension and proteinuria developing after 20 weeks of gestation. It affects approximately 6–8% of all pregnancies, most often the primigravidas.[1] It is one of the most important causes of maternal and fetal morbidity and mortality.

Many theories are proposed for the pathophysiology of preeclampsia. The formation of a uteroplacental vasculature insufficient to supply adequate blood to the developing fetus results in fetoplacental hypoxia, leading to imbalances in the release and metabolism of prostaglandins, endothelin, and nitric oxide by placental and extraplacental tissues. These as well as enhanced lipid peroxidation and other undefined factors contribute to the hypertension, platelet activation and systemic endothelial dysfunction characteristics of preeclampsia.[2] Activation of coagulation system in small vessels and increased platelet aggregation is present in preeclampsia. It is clear that preeclampsia is one of the cause of maternal thrombocytopenia and the platelet count increases rapidly after the delivery. There are studies suggesting the storage of platelet in the areas with endothelial damage, as the cause of thrombocytopenia.[3]

The aim of this study is to evaluate the relationship between the severity of preeclampsia and hemoglobin and platelet levels.

Methods

One hundred and twenty seven cases of mild preeclampsia, 96 cases of moderate preeclampsia and 71 cases of severe preeclampsia diagnosed in Obstetrics and Gynecology Clinic of Inonu University between the years January 2004 – August 2007 were evaluated retrospectively. Hellp Syndrome was present in 15 out of 71 severe preeclampsia cases. One hundred and eight healthy pregnant women with similar demographic features and gestational age and without the diagnosis of preeclampsia, gestational or chronic hypertension and proteinuria were included in the study as the control group. The cases with systolic blood pressure greater than 140 mmHg, diastolic blood pressure greater than 90 mmHg on two measurements taken 6 hours apart, or the cases with 30 mmHg increase in systolic blood pressure, 15 mmHg increase in diastolic blood pressure compared with the pre-pregnancy values, in association with proteinuria more than 300 mg in 24 hours urine were included in the mild preeclampsia group. The cases were accepted as mild preeclampsia if the the diastolic blood pressure was less than 100 mmHg and as moderate preeclampsia if the diastolic blood pressure was 110 mmHg. The cases with the following criteria are included in the severe preeclampsia group: Blood pressure greater than 160/110 mmHg, Oliguria (<400 ml in 24 hours urine), Headache, blurred vision, right epigastric- right upper quadrant pain, Pulmonary edema and cyanosis, >5 gr proteinuria in 24 hours urine or >+++ proteinuria in spot urine sample, Thrombocytopenia (<100.000/mm^3), Abnormal liver function tests.

These criteria were not present in cases with moderate preeclampsia. Age, gravida and parity, gestational age, hemoglobin and platelet values at the time of diagnosis, 1st and 5th minute Apgar scores and the birth weight of the cases were compared.

Statistical analyses were carried out by employing the Statistical Package for Social Sciences soft-ware10.0 for Windows package software (SPSS, Inc., Chicago, IL, USA). For the group comparison, variance analysis was used if the data was normally distributed and Kruskal-Wallis test was used if not. If the difference between the groups was found significant, Mann-Whitney U test was used to find out the groups creating the difference after the Benferroni correction was done. For two group comparison, student t test was used if the data was normally distributed and Mann-Whitney U test was used if not. The relationship between the two data was evaluated by ki square test. The p value <0.05 was accepted as significant.

Results

Demographic characteristics of the cases were similar. There were no difference between the four groups in respect to age, gravida and parity. The gestational age was significantly greater in mild preeclampsia cases (Table 1, Table 2). While the mild preeclampsia cases were delivered mostly vaginally, the cesarean section rates increased with increasing severity of preeclampsia ($p<0.05$). The birth weight and the first and fifth minute Apgar scores were significantly lower in severe preeclampsia cases ($p<0.05$) (Table 2, Table 3). There was no difference between the four groups in respect to hemoglobin values. The mean platelet values were lower in severe preeclampsia cases ($p<0.05$) (Table 1 and Table 2, Figure 1).

Discussion

A transient mild thrombocytopenia is seen due to increased consumption during pregnancy. In a study aiming to find the reference values of hematological parameters in pregnancy, healthy pregnant women were compared with non pregnant women, and the hemoglobin values were found to be decreased through out the pregnancy, while the platelet values decreased in the third trimester.[4] In another study comparing the platelet count and volume in 23 weeks healthy pregnant women and nonpregnant women, the platelet count and volume were found to be similar.[5]

Thrombocytopenia is found in approximately 6, 6 to 11, 6 % of pregnancies.[6] The most common cause is gestational thrombocytopenia[7] and the second common cause is preeclampsia and eclampsia.[8] It's found that thrombocytope-

Table 1. Demographic characteristics.

	Mild preeclampsia (n=127)	Moderate preeclampsia (n=96)	Severe preeclampsia (n=71)	Control (n=108)	P
Age median (min-max)	29 (18-44)	29.5 (18-42)	27 (17-42)	28 (18-43)	0.243
Gravida median (min-max)	2 (1-11)	2 (1-13)	2 (1-16)	2 (0-9)	0.159
Parity median(min-max)	1 (0-10)	1 (0-12)	0 (0-13)	1 (0-7)	0.099
Gestational age (week) median (min-max)	37 (26-41)	36* (28-40)	35* (22-40)	37 (29-41)	0.000
Platelet (/mm3) (mean± standard deviation)	259.1±73.9	262.6±86.5	159.6±90.8*	267.2±71.1	0.000
Hemoglobin (g/dl) (mean± standard deviation)	11.9±1.5	12.1±1.6	12.2±1.7	11.7±1.7	0.258

**Groups creating the difference*

Table 2. P values of the two group comparisons.

	Gestational age	Platelet	Birth weight	Apgar 1	Apgar 5	Cord pH
Mild vs moderate	0.000	0.747	0.000	0.174	0.015	0.745
Mild vs severe	0.000	0.000	0.000	0.000	0.000	0.026
Mild vs control	0.262	0.400	0.718	0.000	0.808	0.000
Moderate vs severe	0.053	0.000	0.014	0.007	0.005	0.088
Modetare vs control	0.011	0.683	0.000	0.000	0.019	0.000
Severe vs control	0.000	0.000	0.000	0.000	0.000	0.000

Table 3. Neonatal results.

	Mild preeclampsia (n=127)	Moderate preeclampsia (n=94)	Severe preeclampsia (n=71)	Control (n=108)	P
Birth weight (g)	3008.9±751.2	2496.4±779.9*	2168.5±905.1*	3040.5±551.4	0.000
Apgar score, 1. min	7* (3–9)	7* (3–9)	7* (3–9)	8 (6–9)	0.000
Apgar score, 5. min	10 (3–10)	10* (6–10)	9* (3–10)	10 (8–10)	0.000
Cord pH	7.30* (6.9–7.47)	7.31* (7–7.51)	7.26*(6.9–7.41)	7.32 (7.13-7.49)	0.000
Labor (n,%)	79 (62.2)	42 (44.7)	19 (26.8)	67 (62)	0.000
Vaginal Cesarean	48 (37.8)	52 (55.3)	52 (73.2)	41 (38)	

**Groups creating the difference*

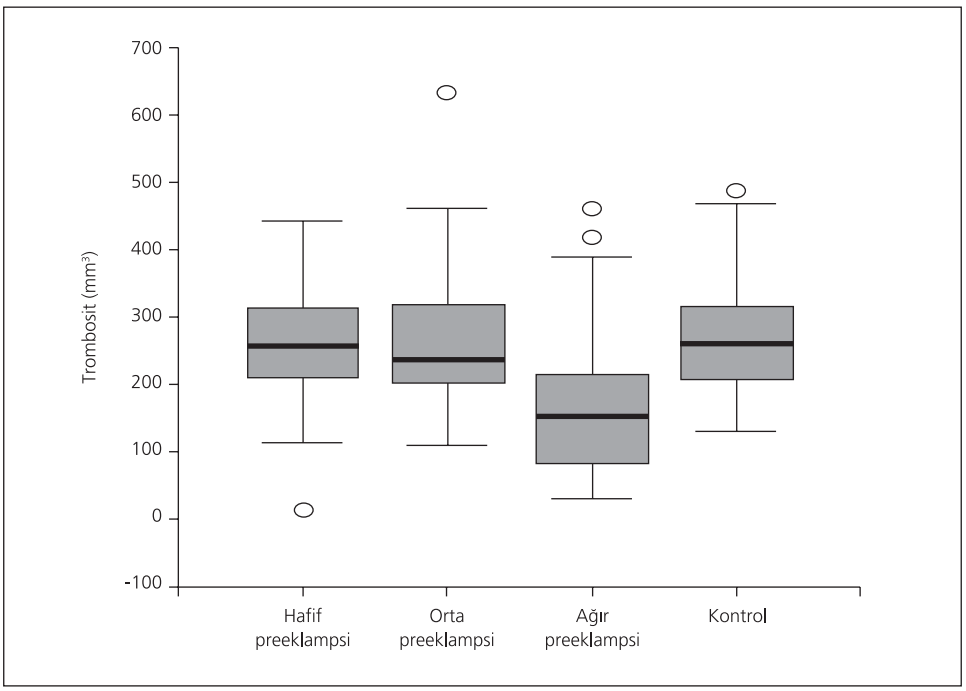

Figure 1. Platelet value of groups.

nia increases the severity of the primary disease it's associated with and increases the risk of perinatal complications as placental abruption, preterm delivery, low Apgar score and still-birth.[7]

The pathogenesis of thrombocytopenia in preeclampsia is not clear, but it's suggested that thrombocytopenia is due to endothelial damage and the peripheral consumption.[9] It's also found that in pregnancies complicated with preeclampsia, the life span of platelet is reduced to 3 to 5 days and the altered platelet membrane accelerates its aggregation and destruction.[10]

Jaremo et al.[11] found in a study that, platelet count decreases significantly in preeclampsia and the mean platelet volume increses in severe preeclampsia.

In a retrospective study conducted to determine whether changes in platelet counts precede the onset of preeclampsia, platelet counts were compared in preeclamptic and healthy pregnancies. Platelet counts during the first half

of pregnancy, 3–6 weeks before delivery, and at the time of delivery were compared. In pregnant women who developed preeclampsia, mean platelet counts at 3–6 weeks before delivery was significantly lower, but within lower limit of normal range. Mean platelet counts at time of delivery were significantly lower in preeclamptic cases. According to this study, mild thrombocytopenia or subclinical thrombocytopenia (platelet counts at lower limit of normal range) during the second half of pregnancy precedes preeclampsia, so serial platelet counts in high-risk pregnant women is necessary to predict the development of preeclampsia.[12] In another study, also subclinical thrombocytopenia is detected in preeclamptic cases with platelet count within normal range.[13] Howarth et al.[14] in a study conducted with 349 cases with normal pregnancy and 30 cases with preeclampsia, evaluated the platelet count and mean platelet volume and found the sensitivity as 90% and specificity as 83.3% for the prediction of preeclampsia development. Ahmet et al.[15] also proposed that serial detection of platelet volume can be helpful in determining the cases with preeclampsia risk.

Studies evaluating the correlation between the severity of preeclampsia and the degree of thrombocytopenia, couldn't find any relationship. Neiger et al.[13] evaluated the platelet count in preeclamptic pregnancies and couldn't find significant difference between the mild and severe preeclampsia. In 2005 Ceyhan et al.[16] evaluated the hematological parameters in 56 preeclamptic and 43 healthy pregnancies, and again couldn't find significant difference between mild and severe preeclampsia in respect to hemoglobin and platelet values.

In our study, the preeclamptic cases were evaluated under three groups as mild, moderate and severe preeclampsia. We evaluated the relationship between the hemoglobin and platelet values and the severity of preeclampsia. The hemoglobin values were not significantly different between the groups. It is known that, iron preparations are widely used during pregnancy and this can influence the hemoglobin values. The preeclampsia cases included in our study didn't have regular prenatal visits so we have no idea about the iron usage during the pregnancy.

We found the platelet count significantly low in severe preeclampsia group. This result proposes a possible relationship between the platelet count and the severity of preeclampsia. We also found the birth weight and 1st and 5th minute Apgar scores lower in severe preeclampsia group. Early identification of the cases with preeclampsia risk is important for the management of both mother and the new born. Randomized controlled studies with more extensive series of samples are required.

Conclusion

We found a relationship between the platelet count and the severity of preeclampsia. Randomized controlled studies with more extensive series of samples are required to detect the relationship between the platelet count and the severity of preeclampsia.

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The Role of Uterine Artery Doppler and Maternal Serum D-dimer Levels in Prediction of Preterm Labor

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Abstract

Objective: To determine the role of uterine artery Doppler findings and serum d-dimer levels in prediction of preterm labor in women hospitalised for threatening preterm labor.

Methods: 15 (20.27%) and 59 (79.73%) of 74 pregnant women delivered before and after 37 completed weeks respectively. Ultrasonographic length of the cervix, Bishop scores and uterine artery RI values were not significantly different (p = 0.225; 0.59; 0.622 and 0.331) between both groups. Maternal serum d-Dimer geometric means were 1502.57 ng/ml and 1052.41 ng/ml in preterm and term delivery groups respectively. (p=0.023) 4 (%26.7) women in the preterm versus 2 (%3.4) in the term delivery group had bilateral diastolic notches. [p=0.013, RR:4.12 (1.88-9.01)]. Multiple logistic regression analysis revealed bilateral diastolic notches in the uterine arteries as the only significant factor for prediction of preterm delivery with a sensitivity, specificity, positive and negative predictive value of 0.27; 0.97; 0.67 and 0.84 respectively.

Results: This prospective cohort study was conducted in the perinatology unit of the Süleymaniye Maternity Hospital during 30.01.2004 thru 20.07.2006. Pregnant women hospitalised for threatening preterm labor were evaluated with Bishop's cervical score, cardiotocography, cervical length measurment by abdominal ultrasound, bilateral uterine artery Doppler and measurement of serum d-dimer levels. After delivery patients characteristics were compared between women who delivered before completed 37 weeks and those who delivered later. Parameters with significant difference between the two groups were used in a logistic regression model to adjust for confounding. All statistical work was done with Cruncher Statistical System – NCSS 2000 (McGraw Hill) software.

Conclusion: Maternal serum d-Dimer levels and uterine artery Doppler characteristics are two promising parameters that might be helpful to predict preterm delivery. But our conclusions need to be substantiated by large scale prospective studies before to be recommended for routine clinical use..

Keywords: Preterm labor, uterine artery Doppler, serum D-dimer level.

Uterin arter Doppler bulguları ve maternal serum D-dimer Seviyelerinin erken doğum öngörüsündeki rolü

Amaç: Erken doğum tehdidinde serum D-dimer seviyeleri ile uterin arter Doppler bulgularının prognoz tayinindeki rollerinin saptanması.

Yöntem: Prospektif kohort tasarımlı çalışmamıza 30.01.2004 ile 20.07.2006 tarihleri arasında Süleymaniye Doğum ve Kadın Hastalıkları Eğitim ve Araştırma Hastanesi doğum servisinde erken doğum tehdidi nedeniyle yatırılan olgular dahil edildi. Tüm olgularda Bishop skorlama, abdominal ultrasonografi ile serviks boyu ölçümü, kardiotokografi, bilateral uterin arter Doppler tetkiki ve serum D - dimer düzeyleri tayini yapıldı. Gebelik sonuna kadar izlenen olgular, 37. gebelik haftası öncesinde ve sonrasında doğum yapan grup-

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lara ayrılarak, her iki grup arasında EDT nedeni ile hospitalizasyon esnasında saptanan parametreler açısından farklılık olup olmadığı irdelendi. Anlamlı farklılık gösteren parametreler çoklu lojistik regresyon analizine tabi tutuldu. Tüm istatistiki analizler Cruncher Statistical System – NCSS 2000(Mc Graw Hill) yazılımı yardımı ile yapıldı.

Bulgular: Değerlendirmeye alınan toplam 74 olgudan 15'i (%20.27) 37. haftadan önce 59'u (%79.73) 37. haftadan sonra doğum yaptı. Bishop skorları, ultrasonografik serviks boyu ve sağ ve sol uterin arter RI değerleri iki grup arasında anlamlı farklılık göstermedi (p = 0.225; 0.59; 0.622 ve 0.331). Maternal serum D-dimer düzeyi geometrik ortalaması preterm doğum grubunda 1502.57 ng/ml, term doğum grubunda 1052.41 ng/ml bulundu (p=0.023). Bilateral uterin arterlerde diastolik çentikleşme (UADÇ) ED grubunda 4 (%26.7) olguda, kontrol grubunda 2 (%3.4) olguda izlendi. [p=0.013, RR:4.12 (1.88-9.01)]. Çoklu regresyon analizi sonrası sadece UAÇDde gruplar arasında anlamlı farklılık sebat etti. Bilateral UAÇD bulgusunun duyarlık, özgünlük, pozitif kestirim ve negatif kestirim değerleri sırası ile 0.27; 0.97; 0.67 ve 0.84 idi.

Sonuç: D - dimer ve uterin arter Doppler sonografisi erken doğum öngörüsünde gelecek vaat eden iki parametredir. Ancak rollerinin tam olarak anlaşılabilmesi için daha geniş prospektif çalışmalara ihtiyaç vardır.

Anahtar Sözcükler: Erken doğum tehdidi, serum D-dimer düzeyi, uterin arter Doppler bulguları.

Introduction

Preterm labor is defined as the presence of three or more uterine contractions in a period of 10 minutes to effect cervical changes or a determination of cervical dilatation 2 cm or above or a cervical effacement 80% or above between 20 and 37 weeks of gestation.[1-3] In spite of the advanced neonatal care, preterm births except congenital malformations account for 70-80% of neonatal mortality.[4] But not enough progression has been achieved in the prediction of preterm labor. Only a small proportion of pregnant women hospitalized with threatened preterm labor actually end up with preterm delivery, and for the rest valuable resources such as manpower, time etc. are wasted.

Preterm delivery is one of the leading causes of neonatal mortality and morbidity. Approximately 5-15% of pregnancies end up with preterm delivery.[5-8] Thereby, early identification of pregnant women with a high risk for preterm delivery is one of the main goals of Obstetrics.

Although most of the clinical studies associate preterm labor with subclinical or clinical inflammation, there are studies suggesting that partial placental ablation, an entity difficult to diagnose, might play a role in a certain proportion of cases of preterm delivery.

In our study, we tried to find out whether umbilical and uterine artery Doppler and maternal serum d-dimer levels used as indirect indicators of silent placental ablation, might help further to identify a subgroup with a high risk for preterm delivery among pregnant women hospitalised for threatened preterm labor.

Methods

Our study is designed as a prospective cohort study.All pregnant women hospitalised because of threatened preterm labor at the Süleymaniye Maternity Hospital Obstetrics Department between 30.01.2004 and 20.07. 2006 are included.

Inclusion Criteria: 20-35 weeks of gestation, 3 or more uterine contractions per 10 minutes, singleton pregnancy, positive fetal heart activity diagnosed by USG and/or NST.

Exclusion criteria: Preterm membrane rupture, placental ablation, fetal distress, cases in the phase of active labor.

All women meeting the inclusion criteria underwent a complete physical examination after recording the medical and obstetrical story. Bishop Scores were acquired by vaginal examination. Blood and urine samples are derived for CBC, Urine analysis, blood group and serum D-Dimer level determinations. D-

Dimer levels are determined by using the Elisa method with VIDAS D-dimer Exclusion test (bioMerieux Clinical Diagnostics, Marcy I'Etoile, France) kit.

Age, gravida, parity, number of abortion, contraction frequency per 10 minutes were noted from the hospital records. Also, applied treatment protocols, duration of treatment and complications were noted. As the part of routine tocolysis regimen, all patients were sedated by 10 mg diazepam IM and hydrated with 1000 cc. Ringer Lactate Dextrose 5% infusion. In the case of persistent uterine contractions, nifedipine 10 mg capsules 4x2 p.o. was delivered for 48 hours. In case of failed therapy, patients were treated with indomethacine (1x100 mg rectally as bolus dose, 4x50 mg per oral as maintenance dose) before 32 weeks of gestation. After 32 weeks ritodrine was used with the following protocol: initial dose of 100 mcg/min., increased by 50 mcg/min. every 20 minutes until the cessation of the contractions. maximum allowed dose: 350 mcg/min.

Screening for fetal abnormalities, complete fetal biometrical, cervical length, and fetal and maternal Doppler measurements were done with a high resolution ultrasound device (General Electric MD 400 5 MHz abdominal probe or Voluson 730 Expert 7 Mhz abdominal probe) at our prenatal diagnosis unit. RI and PI values, existence of notch in the right and/or left uterine artery and RI and PI values, lack of diastolic flow and reversed diastolic flow at umbilical artery were noted.

After the estimated birth date, the patients were contacted by phone and a standardized questionnaire containing birth date, birth weight, neonatal intensive care unit necessity in neonatal period, congenital abnormalities noticed after delivery, the mode of delivery, additional health problems during pregnancy and need of hospitalisation, current health condition of the newborn, maternal health problems during and after delivery was used to collect data.

The patients were divided into two groups according to the gestational age at birth. Cases who delivered before and after completed 37 weeks of pregnancy comprised the preterm and term delivery groups respectively. Statistical analysis was performed with the Number Cruncher Statistical System- NCSS 2000 (Mc Graw Hill) software. In data analysis, differences between the groups were checked with independent t test, and Fisher's exact test as well as descriptive statistical analysis expressed as mean ± SD. A multivariate logistic regression model was used to check for confounding factors. Sensitivity, specificity, positive and negative predictive values, relative risks of all factors significantly associated with preterm labor either alone or combined, were calculated. All differences with $p<0.05$ or 95% confidence interval not crossing "1" were considered to be significant.

Results

Eighty-five women hospitalised for threatened preterm labor between 30.01.2004 and 20.07.2006 and meeting the inclusion criteria were allowed to participate in this study. 11 patients were excluded because of address modification or wrong phone number. Thus the study was conducted with 74 patients.

15 patients (20.27%) delivered before 37 weeks (preterm delivery group), and 59 patients (79.73 %) after 37 weeks of gestation (term delivery group).[9] patients delivered vaginally and 6 patients had caesarean section in the preterm delivery group. The indications for caesarean section were breech presentation in 2 patients, two prior caesarean deliveries in 3

patients and elective caesarean section in 1 patient. All patients were operated in the active phase of labor.

Demographical data and gestational age at the initial hospitalization were not different between both groups (Table 1). Mean platelet volume was significantly low in the preterm delivery group (Table 2). Bishop scores, cervical length, the duration of tocolysis and the mean contraction frequency were not significantly different between two groups (Table 3).

Analysis of serum D-Dimer levels, RI and PI values of right and left uterine arteries, RI and PI values of umbilical artery revealed that only the geometrical mean of D-Dimer levels was significantly different. In the preterm delivery group geometrical mean of D-Dimer was 1502.57 ng/ml, whereas the term delivery group had a geometrical mean of 1052.41 ng/ml (p=0.023) (Table 4).

Notching in the right uterine artery only showed no significant difference, whereas notching in the left uterine artery only or in bilateral uterine arteries were significantly different between both groups. Also the finding of any unilateral notching in the right or left uter-

Table 1. Demographic characteristics of preterm and term delivery groups.

	<37 weeks	>37 weeks	t	p
Age	26.8±4.3	26.85±5.63	-0.03	0.976
Gravida	2.67±1.8	2.44±1.7	0.45	0.652
Parity	1.2±1.15	0.88±1.02	1.06	0.295
Abortion	0.47±0.92	0.58±1.21	-0.33	0.744
GAA	213.13±33.36	227.66±20.99	-1.61	0.126

Results are expressed as Median ± Standart deviation. GAA: Gestational age at admission

Table 2. Hematological parameters in preterm and term delivery groups.

	< 37 weeks	> 37 weeks	t	p
Hct	33.47± 3.57	33.64±3.83	-0.15	0.878
MCV	87.75±5.32	87.26±5.32	0.32	0.751
WBC	12.64±2.74	11.44±3.04	1.39	0.169
PLT	256.4±66.25	226.07±67.66	1.56	0.124
MPV	8.46±1.25	9.96±1.79	-3.05	0.003

Hct: Hematocrit, MCV: Mean corpuscular volume, WBC: White blood cell, PLT: Platelet, MPV: mean platelet volume. Results are expressed as Mean ± Standart deviation.

Table 3. The duration of tocolysis (hours), contraction frequency per 10 minutes, Bishop score, cervical length in preterm and term delivery groups.

	< 37 weeks	> 37 weeks	t	p
Duration (hours)	36.0±27.44	39.97±35.19	-0.41	0.686
Freq of contractions	3.6±2.41	3.78±1.69	-0.34	0.739
Bishop score	2.4±2.03	1.8±1.62	1.22	0.225
Servical length	34.0±7.38	34.98±5.96	-0.54	0.59

The duration of tocolysis (hours), contraction frequency per 10 minutes, Bishop score, cervical length in preterm and term delivery groups. Results are expressed as Mean ± Standart deviation.

Table 4. Geometrical mean of serum D-Dimer (ng/ml), Doppler indices of uterin arteries and umblical artery.

	<37 weeks	>37 weeks		
	Mean±SD	Mean±SD	t	p
D-Dimer	1502.57	1052.41	2.32	0.023
Right UA PI	0.86±0.4	0.83±0.35	0.37	0.714
Right UA RI	0.54±0.13	0.52±0.12	0.50	0.622
Left UA PI	0.95±0.45	0.91±0.52	0.33	0.741
Left UA RI	0.58±0.15	0.54±0.12	0.98	0.331
Umb A PI	1.07±0.41	0.97±0.24	0.93	0.368
Umb A RI	0.65±0.15	0.65±0.17	0.10	0.92

UA: Uterin artery, Umb A: Umblical artery, PI: Pulsatily Index, RI: Resistance Index. Results are expressed as Mean ± Standart deviation.

ine arteries showed no significant difference between two groups (Table 5).

In a multivariate logistic regression model with the preterm delivery as the dependent variable, notching in bilateral uterine arteries remained as the only factor significantly associated with preterm delivery. (Odds Ratio = 12.667, 95% CI: 2.017 – 79.533)

To determine the diagnostic significance of notching in bilateral uterine arteries, sensitivity, specificity, positive and negative predictive values and accuracy were calculated and found to be 0.27, 0.97, 0.67, 0.84 and 0.82 respectively (Table 7).

At a threshold of 1700 ng/ml for serum D-dimer level, elevated serum D- dimer and notching in the uterine arteries combination is significantly frequent in preterm delivery group (Table 8). The corresponding values for sensitivity, specificity, positive and negative predictive values and accuracy of elevated serum D-dimer levels and notching in the uterine artery are shown at Table 9.

Discussion

Plasma D-Dimer level is considerably elevated and used as a helpful biomarker in clinical sit-

Table 5. The frequency of notch in bilateral uterin arteries in preterm and term delivery groups.

		<37 weeks		>37 weeks		P
Right UA	Normal	11	%73.3	54	%91.5	
	Notch	4	%26	5	%8.5	0.075
Left UA	Normal	11	%73	56	%94.9	
	Notch	4	%26	3	%5.1	0.027
Bilat UA	Normal	11	%733	57	%96.6	
	Notch	4	%26	2	%3.4	0.013
Each UA	Normal	11	%733	53	%89.8	
	Notch	4	%267	6	%10.2	0.110

UA: Uterin artery, Bilat: Bilateral

Table 6. Multivariate logistic regression analysis.

	RR	SD	p	OR	%95 CI
d-Dimer	-0.001	0.001	0.059	0.999	0.998–1.00
Bilateral UA	2.539	0.937	0.007	12.667	2.017–79.53
Funneling	9.048	25.923	0.727	8.63	0.028–98.82

UA: Uterin artery, OR: Odds Ratio

Table 7. Clinical diagnostic significance of notch in uterin artery.

Notch +	Sensitivity	Specificity	PPV	NPV	Accuracy	RR-%95 CI
Right UA	0.27	0.92	0.44	0.83	0.78	2.63 (1.05-6.51)
Left UA	0.27	0.95	0.57	0.84	0.81	3.48 (1.50-8.05)
Bilateral UA	0.27	0.97	0.67	0.84	0.82	4.12 (1.88-9.01)
UA	0.27	0.90	0.40	0.83	0.77	2.33 (0.91-5.90)

UA: Uterin artery PPV: positive predictive value, NPV: negative predictive value, RR: Risk ratio, CI:Confidence interval

Table 8. Serum D-Dimer level, notch in uterin artery and the combination of these parameters in preterm and term delivery groups.

		<37 Weeks		>37 Weeks		P
D-dim(+)	D-dimer +	3	20.0%	7	11.9%	
	D-dimer -	12	80.0%	52	88.1%	0.414
UA	Notch	4	26.7%	6	10.2%	
	Normal	11	73.3%	53	89.8%	0.110
D-Dim(+)+ UA	Patolojik	1	6.7%	1	1.7%	
	Normal	14	93.3%	58	98.3%	0.013
D-dim(+) veya UA	Patolojik	6	40.0%	12	20.3%	
	Normal	9	60.0%	47	79.7%	0.110

D-Dimer (+) ? 1700 ng/ ml, UA: Uterin artery

Tablo 9. Diagnostic significance of serum D-Dimer, notch in uterin arteries and the combination of these parameters for preterm delivery.

	Sensitivity	Specificity	PPV	NPV	Accuracy	RR -%95 CI
D-dim(+)	0.20	0.88	0.30	0.81	0.74	1.60 (0.54- 4.69)
Çent(+)	0.27	0.90	0.40	0.83	0.77	2.33 (0.91-5.90)
D-dim(+)+ Notch(+)	0.07	0.98	0.50	0.81	0.80	2.57 (0.59-11.10)
D-dim(+) veya Notch(+)	0.40	0.80	0.33	0.84	0.72	2.07 (0.85-5.03)

D-Dimer (+) ≥ 1700 ng/ ml, Notch (+): notch in uterin arteries, Sen: sensitivity, Spe: specifity, PPV: positive predictive value, NPV: negative predictive value, Acc: Accuracy, RR: Risk ratio, CI: Confidence interval

uations such as acute pulmonary embolism, disseminated intravascular coagulation and abruptio placenta.[10,11] Although serum D-Dimer levels increase with gestational age, there is no convincing data derived from large scale studies.

Kline et al. showed that mean plasma D-Dimer levels increase from 430 ng/ml in the preconceptional period to 579 ng/ml in the first, 832 ng/ml in the second and 1159 ng/ml in third trimester of pregnancy in a study designed with 50 and completed 18 cases.[12]

Francalanci et al. showed that plasma D-Dimer levels increase by gestational age and second and third trimester levels of plasma D-dimer are significantly higher than healty non-pregnant women.[13]

Chabloz et al., exploring the correlation between d-Dimer and Thrombocyte Activating Factor Inhibitor (TAFI) levels, have determined the 5-95% confidence limits of plasma D-dimer levels at first, second and third trimester as 139-602 ng/ml, 291-1232 ng/ml and 489-2217 ng/ml. The mean maternal plasma D-dimer level and 5-95% confidence interval during delivery were 1581 ng/ml and (678 - 5123 ng/ml) respectively. Statistical significance of this finding.[14]

Haznedaroglu et al, found mean maternal plasma D-Dimer levels in preterm delivery, term delivery and non pregnant women to be 203.2±127.4 ng/ml, 69.5±25.1 ng/ml and 34.2±7.6 ng/ml respectively. The difference was significant.[15]

In another study performed to evaluate the clinical use of D-Dimer in preterm delivery, mean plasma D-Dimer level in the preterm delivery and term delivery groups were significantly different and 2544 ng/ml and 1750±839 ng/ml respectively.[16]

In a cohort of pregnant women hospitalised for threatened preterm delivery, we found a sig-

nificant difference in the geometric means of the initial serum D-Dimer levels of preterm and term delivery groups, 1502.57 ng/ml and 1052.41 ng/ml respectively (p=0.023). But this difference lost its significance in multivariate logistic regression analysis.

Abnormal Doppler waveform of uterine arteries indicates an increased impedance secondary to the reduced trophoblastic invasion of the tunica muscularis of the spiral arteries.[17,18] This might lead to abnormal uteroplacental blood perfusion which in turn might cause a tendency to some serious pregnancy complications such as preeclampsia, intrauterine growth retardation and abruptio placentae.[19] A literature survey about the relationship between preterm delivery and Doppler indices of uterine arteries, revealed many studies which nevertheless contained considerable differences from our study in terms of study design research methodology, screened parameters and statistical evaluation.

Axt-Fleidner et al. assessed the role of uterine artery colour Doppler waveform analysis in the prediction of adverse pregnancy outcome defined as delivery before 34 weeks, intrauterine fetal death, preeclampsia associated with placental abruption and/or intrauterine growth retardation. The sensitivity, specificity, positive and negative predictive value, and relative risk of notching in both uterine arteries were 83, 79, 33, 97 and 12.2, respectively.[20]

Park et al. performed a study in a low risk population and defined the abnormal waveform as two SDs higher than the mean S/D ratio at same gestational week and/or diastolic notching. They showed that delivery before 34 weeks was significantly more frequent in women with an abnormal waveform. RR for preterm birth, was 2.67 (1.24 – 5.74) and 5.88 (2.46 – 14.7) in women with unilateral and bilateral abnormal uterine artery Doppler waveforms respectively.[21]

In another study performed in a high risk population and with the abnormal waveform defined as early diastolic notching in any uterine arteries, the frequency of delivery before 37 weeks of gestation was 16 % in the normal and 41 % in the abnormal waveform group [OR: 7.9 (4.6–13)].[22]

Agar et al. showed that RI, PI and S/D values are significantly different in preterm and term delivery groups. The mean S/D, mean RI and mean PI were 2.16±0.38, 0.36±0.14 and 0.44± 0.17 in the term delivery, and 2.56±0.20, 0.65± 0.09 and 0.54±0.21, in the preterm delivery groups respectively. In the analysis of ROC curve, RI was found to be the most valuable predictor for preterm delivery with 95.8 % sensitivity, 87.7% specificity, 70% positive predictive and 84% negative predictive value.[23]

One study performed in normal pregnant population showed that uterin artery PI was significantly higher in preterm delivery group (< 33 weeks of gestation) than term delivery group, but ROC curve analysis could not prove its prognostic significance either alone or in combination with other parameters.[24]

Another study performed in normal population suggested that the mean PI was 1.06 (0.6 – 2.05) and 1.02 (0.49 – 3.2) in preterm and term delivery groups, respectively.[25]

Irion et al. defined the presence of a protodiastolic notch, peak sistolic/Protodiastolic velocities >2.5, peak systolic/end diastolic velocities >90.centile as abnormal uterine artery Doppler waveform and concluded that these are insignificant as predictive factors in preterm delivery.[26]

We found no significant difference between preterm and term delivery groups in terms of RI and PI values of the of uterin vessels. But the

frequency of prediastolic notching in the uterine artery Doppler waveform in the preterm and term delivery groups were 26.7% (4 cases) and 5.1% (3 cases) respectively, expressing a statistical significance (p=0.027). The preterm delivery rate was also high in patients with bilateral prediastolic notching in uterine arteries (26.7% and 3.4%, p=0.013). After multivariate logistic regression the association of bilateral notching in uterine arteries with the preterm delivery remained significant.

We did not compare a high risk population with a normal population, on the contrary a comparison of patients delivered preterm and term in a high risk population hospitalised for threatened preterm delivery. Also the study group was relatively small. We consider that the differences from the results in the literature are mainly based on these factors. The OR of bilateral prediastolic notching in uterine arteries for preterm delivery was 12.677 (2.017–79.533). The sensitivity, specificity, positive and negative predictive value and relative risk of bilateral notching in the uterine arteries were 0.27, 0.97, 0.67, 0.82 and 4.12 (1.88 -9.01), respectively. The low sensitivity of this finding restricts its clinical value in the prediction of preterm delivery, requiring large scale prospective studies to prove its usefulness.

Conclusion

Maternal serum D-Dimer levels of preterm and term delivery groups were significantly different, but this association lost its significance in the multivariate logistic regression model. The OR for prediastolic notching in uterine arteries for preterm birth was 12 (2.017–79.533). But the low sensitivity of this finding restricts its clinical usefulness. We think that large scale prospective studies are needed to prove the validity of these findings.

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Effect of Tocolysis on Doppler Measurements of Umbilical, Uterine and Spiral Arteries

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Abstract

Objective: The aim of this study is to assess the relationship between the change in Doppler values of umbilical, uterine and spiral arteries with ritodrine tocolysis and the value of these changes.

Methods: Thirty women with gestational age between 26 and 35 weeks admitted to the Obstetric and Gynecology Clinic and had a diagnosis of preterm labor were enrolled to the study. S/D, PI and RI values of uterine, umbilical and spiral arteries were evaluated with color Doppler ultrasonography before and 24 hours after the tocolytic treatment. Patients were evaluated in two groups according to the time gained with tocolysis, as 2-7 days and more than 7 days. The Doppler variables were compared statistically by using paired t test, Wilcoxon Signed Ranks Test and Mann-Whitney U Test.

Results: It was found that a significant decrease only in uterine artery Doppler values were present in cases with 2-7 days gain with tocolysis. In cases with decrease both in uterine and umbilical artery Doppler values, time gained with tocolysis was more than 7 days. Spiral artery Doppler values were not affected with the tocolytic treatment.

Conclusion: Time gained with tocolytic treatment was longer in patients with a significant decrease in S/D, PI and RI values of uterine and umbilical arteries.

Keywords: Preterm labor, tocolysis, Doppler ultrasound.

Tokolitik tedavinin umbilikal, uterin ve spiral arter Doppler bulgularına etkisi

Amaç: Bu çalışmanın amacı, ritodrin ile tokoliz uygulanan preterm doğum eylemi olgularında umbilikal, uterin ve spiral arter doppler değerlerinde elde edilen değişimleri ve bu değişimlerin değerinin olup olmadığını araştırmaktır.

Yöntem: Tokolitik tedavi ile sadece uterin arter doppler ölçümlerinde tedavi öncesine göre anlamlı düşüş tespit edilenlerde, kazanılan sürenin 2- 7 gün arasında olduğu bulundu. Hem uterin hem de umbilikal arter doppler ölçümlerinde tedavi öncesine göre anlamlı düşüş tespit edilenlerde ise tokoliz ile kazanılan süre 7 günden fazla idi. Spiral arter doppler bulgularının ise tokolizden etkilenmediği bulundu.

Bulgular: Kadın Hastalıkları ve Doğum Polikliniğine başvuran 26-35 haftalar arası preterm eylem tanısı alan 30 gebe çalışmaya alındı. Renkli Doppler Ultrasonografi cihazı ile tokoliz başlamadan önce ve tokolizden 24 saat sonra umbilikal, uterin ve spiral arter S/D, PI ve RI değerlerine bakıldı. Hastalar tokolitik tedavi ile kazanılan süreye göre, 2-7 gün kazanılan ve 7 günden fazla kazanılan olmak üzere iki grupta değerlendirildi. Doppler değişkenleri İki Değer Arasındaki Farkın Önemlilik Testi, Wilcoxon Eşleştirilmiş İki Örnek Testi ve Mann- Whitney U Testi ile karşılaştırıldı.

Sonuç: Preterm eylem olgularında, ritodrin tedavisi ile uterin ve umbilikal arter doppler ölçümlerinde tedavi öncesine göre anlamlı düşüş olanlarda kazanılan süre daha uzundur.

Anahtar Sözcükler: Preterm eylem, tokoliz, Doppler ultrasonografi.

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Introduction

Preterm birth is the leading cause of perinatal morbidity and mortality world wide.[1] It increases the risk of respiratory distress syndrome, leukomalacia, necrotizing enterocolitis, bronchopulmonary dysplasia, sepsis, cerebral palsy, retinopathy and mental retardation in the newborn.[2] With the improvement of neonatal intensive care facilities the mortality rate of the newborn decreased, but the severe morbidity due to prematurity continued to be a major problem.[3]

Life expectancy of the preterm infants is related to the gestational age and the birth weight. It's less than 10% for infants smaller than 24 weeks of gestation, while increases to 90% around 30 weeks of gestation. Similarly it's around 10% for infants with birth weight less than 500 grams and increases to 90% for infants with birth weight of 1500 grams.[4,5] It's also known that the morbidity due to prematurity decreases by prenatal corticosteroid treatment.[6] Prevention or delay of preterm birth is important for grow up of the gestation and the appearance of the effect of prenatal corticosteroid treatment. Tocolytic treatment is the most common treatment option for this aim.

Nowadays, the most commonly studied issue in the obstetric field worldwide is the prevention of preterm birth. Prevention of preterm birth depends mostly on early diagnosis or an accomplished foresight. Studies aiming to determine the high risk pregnancies and the success of tocolytic treatment, evaluated the fetomaternal blood flow with Doppler ultrasonography.[7,8]

The aim of this study is to evaluate the changes in the vascular resistance of umbilical, uterine and the spiral arteries with the application of intravenous ritodrine treatment and to find out value of these changes.

Methods

The study was conducted between April 2003 and January 2004 in Obstetrics and Gynecology clinic and 30 cases with a diagnosis of preterm labor between 26 and 35 weeks of gestation were enrolled. The subjects were enrolled after the institutional review board approval. Routine informed consent was taken from all recipients.

Inclusion criteria were the presence of gestational age between 26 and 37 weeks, intact amniotic membrane, regular contractions 4 times in 20 minutes or 8 times in 60 minutes lasting at least 30 seconds, cervical dilatation less than 4 cm or effacement less than 80%. Pregnancies complicated with multiple gestation, intrauterine growth retardation, preterm premature rupture of membranes, diabetes mellitus, fetal anomaly, oligohydramnios, polyhydramnios, chorioamnionitis and pregnancies with unknown gestational age were not included to the study.

Age, obstetric history and gestational age of cases were recorded. The gestational age was determined by the last menstruation period or by the early ultrasonography done before 20 weeks of gestation. Cervix and vagina of all cases were evaluated for infection via speculum examination and swab was taken from cervical canal for culture and gram staining. Dilatation and effacement of cervix were determined in all cases. Fetal biometry and estimated fetal weight were evaluated via obstetric ultrasonography. Monitorization of uterine contractions and fetal cardiac activity were performed via Spacelabs medical AM67 device for 20 minutes. Tocolysis was started to cases with at least 4 contractions of 25-45 mmHg in amplitude within this time period. Cases with less than 4 contractions of 25-45 mmHg in amplitude within 20 minutes were excluded from the study. Before tocolysis maternal and fetal heart rate were

recorded. Two doses of 12 mg betamethasone (Celestone Chronodose ampul, Eczacıbaşı®) were applied intramuscularly (I.M.) 24 hours apart to cases with gestational age less than 34 weeks for providing pulmonary maturation.

Ritodrine hydrochloride (Pre-par ampoule, Eczacıbaşı®) was applied intravenously (I.V.) as the tocolytic agent. It was not combined with other tocolytic agents. Zero point three mg/ml solution was prepared by tittering 150 mg ritodrine hydrochloride (Pre-par ampoule, Eczacıbaşı®) in 500 ml 5% dextrose. Infusion was started with a dose of 50 microgram/ minute (4 drop/min.) and it was increased 50 microgram every 15 minutes till the cessation of contractions or the appearance of side effects. Contractions were documented cardiotogographically. Maximum dose was determined as 350 microgram/ minute. Intravenous treatment continued for 24 hours and oral treatment was not started afterwards. Blood pressure and pulse rate of cases were recorded during and after the tocolysis non-invasively via Marquette Dash 2000 device. None of the cases delivered within 48 hours of the treatment. As the period for maximum effect of steroid is 7 days, we determined the time needed to delay delivery as 7 days and divided cases into two groups as 2–7 days gained till delivery and more than 7 days gained till delivery.

Doppler measurements were performed by the same operator via ATL HDI 3400, Ultrasound System, Bothell, WA, USA device with 5-2 MHz transabdominal probe. Doppler measurements were recorded after the fetal biometric measurements were taken. Doppler indexes were measured before and at the beginning of tocolysis and 20–24 hours after the cessation of the contractions. Since the contractions affect uterine artery Doppler indexes, measurements before tocolysis were taken in periods between contractions with patient positioned slightly laterally on a flat table with 30° head tilt. Systole/ diastole (S/D) ratio, pulsatility index (PI) and resistance index (RI) of umbilical, uterine and spiral arteries were recorded. Umbilical artery measurement was done 3 times on the free loop of the cord, more than 4 cm far from the placental and fetal insertion site and the mean was taken. Uterine artery measurement was done on both right and left side at the point where uterine artery branches form the internal iliac artery and the mean was taken. Spiral artery measurement was done from the base of glomerular structure formed behind the placenta.

Statistical analyses were carried out by employing the Statistical Package for Social Sciences soft-ware10.0 for Windows package software (SPSS, Inc., Chicago, IL, USA). The mean gestational ages of two groups were compared by Mann- Whitney U Test. The Doppler measurements before and after the treatment were compared by paired t test for 30 cases and by Wilcoxon Signed Ranks Test for two groups. Results were evaluated in 95% confidence interval and the p value less than 0.05 was accepted as significant.

Results

The mean age of cases was 25.37 ± 4.92 (18-39) and the mean gestational age was 31.87 ± 2.73 (26-35). The gravity of cases ranged between 1 and 7 and the parity ranged between 0 and 3. Nine cases were nullipara, while 19 cases were multipara and 2 cases were grand-multipara (Table 1). The distribution of cases in groups with 2-7 days gain and >7 days gain, according to the gestational age, are presented in Table 2. The mean gestational ages of the cases with 2-7 days gain and > 7 days gain with tocolysis were 32.63 ± 2.44 and 31.59 ± 2.80

Table 1. Demographic characteristics of the cases.

		Characteristics of cases treated with tocolysis
Yaş (yıl)		25.37± 4.92 (18-39)
Gravity**	Nullipar	9
	Multipar	19
	Grandmultipar	2
Parity**	0	11
	1	16
	2	2
	3	1
Gestational Age (weeks)		31.87 ± 2.73 (26-35)

** Results are given as mean ± standard deviation (minimum-maximum)*
***Given as case number.*

respectively. There was no significant difference between the two values (p=0.342).

The Doppler findings of umbilical, uterine and spiral arteries before and after the tocolysis are presented in Table 3. There was a statistically significant difference for the umbilical and uterine artery S/D, PI and RI values before and after the treatment, while no difference was found for the spiral artery.

In cases with 2-7 days gain with tocolysis, there was no difference between the umbilical artery S/D, PI and RI values before and after the treatment but statistically significant decrease was present for the uterine artery (Table 4).

In cases with >7 days gain with tocolysis, statistically significant decrease was present both for the umbilical and uterine artery S/D, PI and RI values (Table 5).

In cases with 2-7 days gain and > 7 days gain with tocolysis, the difference between the uter-

Table 2. Tokolitik tedavi ile kazanılan süre 2-7 gün ve > 7 gün olan olguların gebelik haftalarına göre dağılımı.

Gestational Age	Cases with 2- 7 days gain	Cases with > 7 days gain	Total
26-29 weeks**	2	7	9
30-34 weeks**	4	11	15
35 weeks**	2	4	6
Total	8	22	30
Mean gestational age*	32.63±2.44	31.59±2.80	p=0.342

**Results are given as mean ± standard deviation..*
***Given as case number..*

Tablo 3. Distribution of cases with 2–7 days and >7 days gain with tocolysis, according to the gestational age.

	Tedavi Öncesi	Tedavi Sonrası	P
Umbilikal Arter			
S/D	2.74 ± 0.58	2.36 ± 0.41	0.001*
PI	1.09 ± 0.27	0.90 ± 0.21	0.000*
RI	0.65 ± 0.08	0.57 ± 0.06	0.000*
Uterin Arter			
S/D	2.72 ± 0.89	2.30 ± 0.61	0.003*
PI	1.13 ± 0.41	0.94 ± 0.35	0.002*
RI	0.61 ± 0.11	0.53± 0.11	0.002*
Spiral Arter			
S/D	1.70 ± 0.27	1.62 ± 0.32	0.275
PI	0.55 ± 0.15	0.51 ± 0.19	0.304
RI	0.42 ± 0.12	0.37 ± 0.11	0.600

**p<0.05*

ine S/D, PI and RI values taken before and after the treatment are presented in Figure 1.

Discussion

In spite of improvements in neonatal intensive care facilities, preterm birth is still the leading cause of perinatal morbidity and mortality. Prevention of preterm birth gained importance with the decrease of incidence of other causes of perinatal morbidity and mortality. Recent studies aimed to determine the high risk pregnancies for preterm birth.

Ritodrine and other tocolytic agents are often used to prevent preterm birth. Ritodrine acts through Beta-1 and Beta-2 receptors. Beta-2 receptors are present on uterus, bronchi and smooth muscle cells of vascular wall. Ritodrine by acting through Beta-2 receptors on vascular smooth muscle cells leads to vasodilatation and decrease in vascular resistance.[9] The increase in uterine perfusion is supplied by more than one mechanism with the I.V. administration of betamimetics. Increase in heart rate and cardiac output, decrease in peripheral vascular resistance and uterine relaxation are some of the mechanisms. Ritodrine administration decreases diastolic period by increasing maternal and fetal heart rate, as a result increases the end diastolic flow.[10] Eventually umbilical and uterine artery S/D ratios decrease. In studies, the I.V. administration of ritodrine is found to increase the uterine perfusion.[11,12]

Studies tried to determine the high risk pregnancies by evaluating the changes in Doppler variables of umbilical and uterine arteries before and after the tocolytic treatment.

Table 4. Comparison of changes in doppler measurements of umbilical and uterine arteries before and after the tocolysis in cases with 2-7 days gain.

	Before Treatment	After Treatment	Difference	P
Umbilical Artery				
S/D	2.76 ± 0.45	2.43 ± 0.49	0.325	0.128
PI	1.12 ± 0.28	0.98 ± 0.30	0.140	0.208
RI	0.65 ± 0.07	0.58 ± 0.07	0.64	0.107
Uterine Artery				
S/D	2.87 ± 0.78	2.14 ± 0.53	0.731	0.012*
PI	1.18 ± 0.35	0.91 ± 0.42	0.277	0.050*
RI	0.62 ± 0.08	0.52 ± 0.11	0.105	0.012*

*$p<0.05$

Table 5. Comparison of changes in Doppler measurements of umbilical and uterine arteries before and after the tocolysis in cases with >7 days gain

	Before Treatment	After Treatment	Difference	P
Umbilical Artery				
S/D	2.73 ± 0.63	2.33 ± 0.39	0.400	0.007*
PI	1.08 ± 0.28	0.87 ± 0.16	0.213	0.002*
RI	0.65 ± 0.09	0.57 ± 0.06	0.077	0.001*
Uterine Artery				
S/D	2.66 ± 0.95	2.36 ± 0.64	0.306	0.014*
PI	1.11 ± 0.44	0.96 ± 0.31	0.154	0.009*
RI	0.60 ± 0.12	0.54 ± 0.11	0.063	0.011*

*$p<0.05$

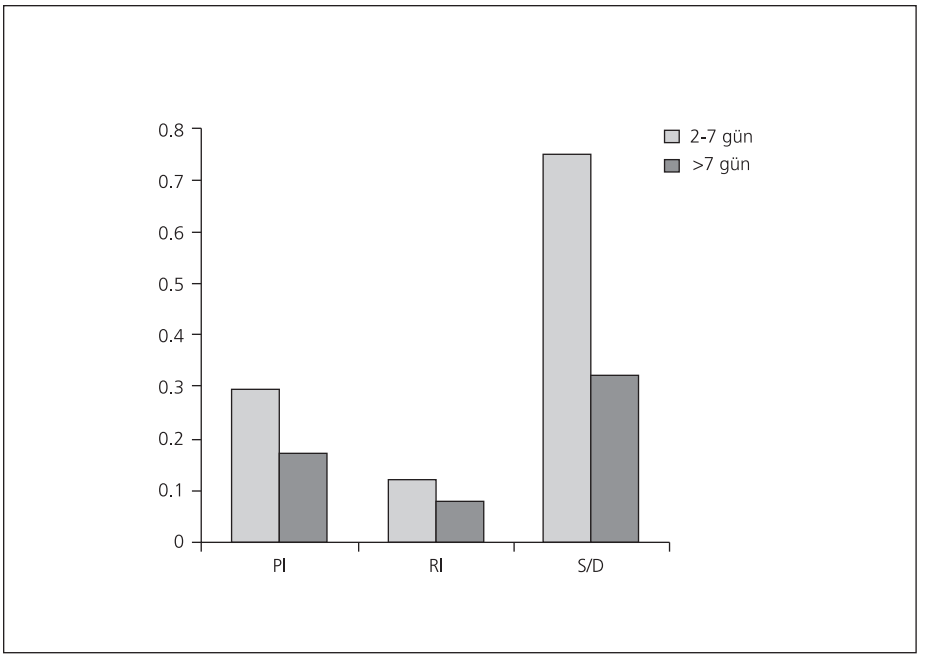

Figure 1. Kazanılan süre 2-7 gün ve 7 günden fazla olan olgularda tokoliz öncesi ve sonrası uterin arter Doppler bulgularının karşılaştırılması.

Brar et al[7] in a study conducted with 92 preterm labor cases of 29-36 weeks of gestation found that cases with high umbilical and uterine artery S/D ratio were more prone to preterm delivery than cases with normal values and concluded that Doppler measurements of umbilical and uterine artery should also be included in the evaluation of preterm labor cases.

Çankaya at al[8] in a study conducted with 62 preterm labor cases of 26-35 weeks of gestation, measured umbilical and both uterine artery S/D ratios and PI values before and during the tocolytic treatment. In cases with high uterine artery S/D ratio before treatment, rate of tocolysis failure was found to be statistically significantly high and in cases with preterm delivery there was no significant change in umbilical artery S/D ratios.

We evaluated the effect of ritodrine on uteroplacental and fetoplacental vascular resistance in cases with preterm labor. We administered I.M. betamethasone to achieve pulmonary maturation in cases with gestational age less than 34 weeks. In studies conducted with pregnancies complicated with absent end diastolic flow in umbilical artery, administration of betamethasone returned end diastolic flow and decreased resistance;[13] however in pregnancies with intrauterine growth retardation or with no complications, betamethasone administration didn't lead to any change in umbilical artery flow rate or pulsatility if the Doppler measurements were normal before the treatment.[14,15] In studies evaluating the effect of betamethasone treatment on uterine artery Doppler measurements couldn't find any change.[15] Doppler measurements of umbilical and uterine artery before the treatment were normal in our study, so in cases receiving betamethasone and ritodrine treatment, the changes in Doppler measurements were attributed to the ritodrine treatment.

The optimum effect of betamethasone administered 12 mg, 24 hours apart for pulmonary maturation is seen 24 hours after the second dose and lasts for 7 days.[16] The aim of tocolysis is to gain this time. Corticosteroids increase pulmonary surfactant secretion and decrease the incidence of neonatal mortality, necrotizing enterocolitis and cerebral hemorrhage.[17] With this knowledge, the cases were divided into two group as 2-7 days gain with tocolysis and >7 days gain with tocolysis for the evaluation of changes in Doppler measurements.

We couldn't find any change in spiral artery S/D, PI and RI values before and after the treatment. This situation can be explained as: During the development of placenta, trophoblastic cells take place of endothelial cells of the spiral arteries starting from the fourth weeks of gestation. This event converts the spiral arteries to low resistant vessels unaffected from vasomotor control.[18]

If the time gained was not considered, a significant decrease was present in uterine and umbilical artery S/D, PI and RI values after the treatment compared to before treatment values. If the time gained was considered, in cases with 2-7 days gain, a significant decrease was present in only uterine artery whereas in cases with >7 days gain, a significant decrease was present both in uterine and umbilical arteries.

We found the time gained with tocolysis was more, if a significant decrease in Doppler measurements after the treatment was present compared to before treatment values in both uterine and umbilical arteries. This study holds out that tocolysis will be successful in cases with significant decrease in uterine and umbilical artery Doppler measurements after the treatment. However it should be supported by prospective studies done in large group of cases.

Conclusion

In cases with preterm labor, the time gained with ritodrine treatment was longer, in the presence of significant drop in Doppler measurements of umbilical and uterine arteries compared with before treatment values. If the result of this study is supported by other prospective studies done in larger group of cases, Doppler measurements can be used in determining the success of tocolytic treatment.

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Frequency of the Hpa-1a Antigen in Pregnant Women

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Abstract

Objective: The aim of the study is to determine incidence rate of Human Platelet Antigen (HPA-1a antigen) negative platelets in pregnants who applied to polyclinic and to research HPA-1a antibody existence in pregnants who were found as HPA-1a negative.

Methods: Two hundred forty pregnants are scanned in the study. HPA-1a was identified by using Enzyme-Linked Immunosorbent Assay (ELISA) method. Alloanticorps were researched in a HPA-1a negative case and HLA-DR identification was performed by polymerase chain reaction (PCR)-SSP method after DNA isolation.

Results: HPA-1a was found as negative only 1 case among 240 pregnants (0.4%). Anti-HPA-1a antibody level and HLA-DR52a result was found as negative in the pregnant found as negative in terms of HPA-1a antigen.

Conclusion: In this study, HPA-1a antigen negativity incidence rate was found as 0.4%. This rate is lower than expected level. Thus, checking newborns for platelet number instead of HPA-1a antigen and DR52a identification may be more effective. In order to determine real incidence rate of HPA-1a in pregnants in our society, a study covering a wider population is required.

Keywords: HPA-1a, neonatal alloimmune thrombocytopenia, HLA-DR52a.

Akdeniz bölgesindeki gebelerde Hpa-1a antijen sıklığının araştırılması

Amaç: Çalışmanın amacı polikliniğe başvuran gebeler arasında Human Platelet Antigen (HPA-1a) antijen negatif trombosit görülme sıklığının belirlenmesi ve HPA-1a negatif olarak tespit edilen gebelerde HPA-1a antikor varlığının araştırılmasıdır.

Yöntem: Çalışmada 240 gebeye tarama yapıldı. Enzyme-Linked Immunosorbent Assay (ELISA) yöntemi kullanarak HPA-1a tiplendirildi. HPA-1a negatif bir olguda alloantikorlar araştırıldı, DNA izole edilmesini takiben de polymerase chain reaction (PCR)-SSP yöntemi ile HLA-DR tiplendirmesi yapıldı.

Bulgular: Bulgular:240 gebede sadece 1 olguda HPA-1a negatif bulundu (0.4%). HPA-1a antijeni yönünden negatif bulunan gebede, anti-HPA-1a antikor seviyesi ve HLA-DR52a sonucu negatif olarak bulundu.

Sonuç: Bu çalışmada HPA-1a antijen negatiflik görülme sıklığı %0.4 olarak bulunmuştur. Bu oran beklenilenden daha düşüktür. Bu nedenle yenidoğanlarda HPA-1a antijeni ve DR52a tiplendirmesinin yerine trombosit sayısına bakılması daha efektif olabilir. Toplumumuzdaki gebelerde HPA-1a nın gerçek sıkığını belirlemek için daha geniş popülasyonu içeren çalışma gerekmektedir.

Anahtar Sözcükler: HPA-1a,neonatal alloimmün trombositopeni, HLA-DR52a.

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Introduction

Neonatal thrombocytopenia is seen at 1% of newborns.[1] Though Human Platelet Antigen (HPA)-1a negativity is seen at a rate of 1/50, one alloimmune thrombocytopenia occurs in 5000 cases born in term.[2] Maternal alloanticorps developed against antigens peculiar to platelets inherited from father pass placenta and causes thrombocytopenia by binding themselves to platelets. Intracerebral bleeding occurs in 10-20% of incurable thrombocytopenia cases. It is reported that 75% of intracerebral bleedings occur during intrauterine period.[3] Fetal death appears in 10% of cases having intracerebral bleeding and neurological damage in 20% of them. In 50-60% of cases, most of cases can only be identified in newborn period due to alloimmunization development in first pregnancy.[4-6] It is accepted that maternal immunization develops against HPA-1a approximately at a rate of 80% in general populations.[7] HPA-1a alloimmunization possibility shows a strong association with the existence of human leukocyte antigen (HLA) class II DR-B3*0101(DR52a) in mother. Creating anti-HPA-1a of a mother having negative HPA-1a is controlled with HLA-DRB3*0101 allele.

There is no study in our country in which HPA-1a antigen frequency is researched on normal population or pregnants. The aim of this study is to establish HPA-1a negativity rate in pregnant women and to research the existence of anti-HPA-1a antibody and to determine its relation with DR52 genotype.

Methods

This study was performed on 240 pregnants who applied Polyclinic of the Department of Obstetrics and Gynecology, Akdeniz University consecutively. Blood samples were taken from cases for routine hemoglobin; they were informed about alloimmunization and after taking their consent, their blood samples were transferred into 2 ml of vacuumed tubes including EDTA and 10 ml of biochemical tubes.

Samples taken into full blood tubes were studied within 6 hours at Enzyme-Linked Immunosorbent Assay (ELISA); blood samples taken into biochemical tubes were first centrifuged and then kept at -80°C by transferring them into tubes. HPA-1a determination in pregnants was studied with ELISA method by using DiaMed Platelet HPA-1a identification test kit (cat.no.030011, DiaMed AG, Switzerland).

No pseudo-negativity was reported in case of the existence of enough platelet for this test. Anti-platelet antibody determination was transferred to the tube on both layers by pipette from 50µL healthy platelets and they were centrifuged for 10 minutes after 30-40 minutes of incubation. Then, DiaCell I-II-III cell mixture was transferred to both tubes by pipette about 50µL. They were centrifuged for 10 minutes and evaluated after 10 minutes of incubation.

If they were gathered on the top of both tubes, they were determined as positive; if they were gathered on the bottom of both tubes, they were determined as negative. For performing HLA-DR52 identification, DNA was isolated from full blood by using Puregene (D–5000),Gentra Systems, Switzerland) kit. HLA-DR identification was performed by using GenoVision Olerup SSP (Olerup SSP, Stockholm, Sweden) kit.

Results

As a result of HPA-1a antigen determination performed on 240 pregnants who applied Polyclinic of the Department of Obstetrics and Gynecology, Akdeniz University, HPA-1a antigen was found as negative only in one case. HPA-1a frequency rate was found as 0.4% among studied population.

Anti-platelet antibody existence was researched in pregnant found as negative in terms of HPA-1a antigen and it was found as negative.

Due to the relation between HPA-1a antigen and HLA-DR52 in neonatal alloimmunization, HLA-DR identification was done after DNA isolation in pregnant having negative HPA-1a and HLA-DR52 was found as negative as HLA-DR51 and HLA-DR52 were found as positive.

Discussion

HPA antigen frequency shows difference as to races. According to the literature, HPA-1a (%77.3), HPA-3a (%3.5), and HPA-5b (3.5%) are clinically antigens as the most important isoimmune thrombocytopenia reasons.[5] Except those, approximately 16 different antigens are defined. There is no data in our country reporting HPA-1a antigen frequency. We found negativity frequency as 0.4% in our study group. This rate is between 1.6% and 2.5% in the literature[8] and it changes as to races and ethnicities. We decided that reaching a rate lower than the rates reported in the literature may be resulted from the minority of our cases. Women having negative HPA-1a constitute 2% of all pregnants and it is observed that antibody was developed in 11% of these cases.[9]

The most important factor affecting the development of Anti-HPA-1a antibody is HLA class II DR52a (DRB3*0101). It can be said that antibody shall not be developed in 99% of women having negative HPA-1 and not having HLA-DR52a. It was reported that antibody was developed in 35% of women having HLA-DR52a and negative HPA-1a; however HLA-DR52a was not suggested as a routine scanning test.[8] HPA-1a identification and determining real frequency of alloantibody scanning enable to determine annual affected case number, to develop health policy for preventive treatment to prevent problems related with thrombocytopenia in first pregnancies.[10] Consequently, HPA-1a identification and scanning alloantibody level at routine antenatal clinics may increase unnecessary invasive initiatives and also it is not economical for our country. Instead of that, it is reported that scanning newborn platelet number would be appropriate.[11]

Though alloimmune thrombocytopenia is rare, its morbidity and mortality are severe.[6,12] Even though there are publications reporting that finding anti-HPA-1a titration higher than 1/32 at antenatal observation shows severe thrombocytopenia; this test is not suggested for using routine observation.[1] It is suggested to perform obstetric ultrasonography bi-weekly for cases having positive HPA antigen.

Previous fetus history is very important antenatal treatment of alloimmune thrombocytopenia. If intracerebral bleeding was observed in previous fetus, treatment can be initiated at 12th gestational week with maternal immunoglobulin (IVIG) and prednisolone.[13,14] If thrombocytopenia is found in cordocentesis performed in 24th gestational weeks in cases having medical treatment, the treatment is carried on with weekly intrauterine platelet transfusion. Fetal loss rate related with transfusion was reported as about 5.5-8.3%. Since these cases generally deliver on 32nd week, they have premature problems more than those having only medical treatments.[15]

Conclusion

Consequently, even though HPA-1a antigen negativity frequency was found as 0.4% in our study; it is seen that a study is required covering a wider population for making a certain decision in our country about HPA-1a antigen frequency in our society, its relation with HLA-DR52a and alloantibody development.

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Retrospective Analysis of 2295 Cases with Invasive Prenatal Diagnosis

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Abstract

Objective: Retrospective evaluation of the results of the chorion villus sampling, amniocentesis, and cordocentesis of 2295 cases performed for prenatal diagnosis.

Methods: Between 2001 and 2007 (first 6 months) 54 cases of genetic chorion villus sampling, 2086 cases of genetic amniocentesis and 155 cases of cordocentesis were evaluated according to indications, success of karyotyping and the results of the karyotyping.

Results: The majority of indication was high risk in triple screening test (n= 835, %36), abnormal ultrasonographic examination (n=493, %21), and advanced maternal age (n=490, %21) in all pregnant, respectively. High risk in triple screening test was the major indication in the cases that amniocentesis performed, abnormal ultrasonographic examination in the cases that cordocentesis and chorion villus sampling were performed. Tissues cultures were not successful in 64 of 2086 cases evaluated by AS, 10 of 155 cases evaluated by KS, 5 of 54 cases evaluated by CVS. Cultures were successful 2226 of 2305 cases (%96.4). Chromosome aberration were detected in 98 of 2216 cases (%4.4). 52 (%2.3) of this chromosomal aberration were number abnormalities, 46 of were structural abnormalities. The most frequent chromosomal abnormality was trisomy 21 in the number abnormalities and pericentric inversion of chromosome 9 in structural abnormalities. Karyotype aberration rate was higher in abnormal ultrasonographic examination (%8.8), advanced maternal age- high risk in triple screening test (%5.1) and advanced maternal age (%3.1). Chromosomal abnormality rate was %2.6 in the most common prenatal diagnosis indication (high risk in triple screening test).

Conclusion: The majority of indication was high risk in triple screening test (%36), abnormal ultrasonographic examination (%21), and advanced maternal age (%21) in all pregnant, respectively. Tissues cultures were successful in %96.4 of cases. Chromosome aberration were detected in %4.4 of cases.

Keywords: Chorion villus sampling, amniocentesis, cordocentesis, and chromosome aberration.

İnvazif prenatal tanı yöntemleri uygulanan 2295 olgunun retrospektif analizi

Amaç: Prenatal tanı amacıyla koryon villus örneklemesi (CVS), amniyosentez (AS), kordosentez (KS) uygulanan 2295 olgunun retrospektif analizi.

Yöntem: 2001–2007 (ilk 6 ay) tarihleri arasında kromozom analizi amacıyla CVS yapılan 54, AS yapılan 2086 ve KS yapılan 155 gebenin endikasyon, karyotipleme başarısı ve karyotip sonuçlarının retrospektif olarak değerlendirilmesi.

Bulgular: Çalışmamızda üçlü testte yüksek risk (n=835, %36), anormal ultrasonografik bulgu (n=493, %21) ve ileri anne yaşı (n=490, %21), prenatal tanı yapılan tüm gebeler için en sık görülen endikasyonlardır. Amniyosentez yapılan vakalarda en sık endikasyon üçlü testte yüksek risk (n=816) iken KS ve CVS yapılan vakalarda anormal ultrasonografik bulgu (n=110, n=45) ilk sırayı aldı. Amniyosentez yapılan 2086 olgunun 64 (%3)'üne, kordosentez yapılan 155 olgunun 10 (%6.4)'una, CVS yapılan 54 olgunun 5 (%9.2)'ine

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olmak üzere prenatal tanı amacı ile gönderilen 2295 hastanın 79 (%3.4)'una sonuç verilememiştir. Tüm olgularda elde ettiğimiz kültür başarısı %96.6'dır. Prenatal tanı için sitogenetik çalışma yapılan ve sonuç verilen 2216 olgunun 98 (%4.4) inde kromozom anomalisi saptanmıştır. Bu kromozom anomalilerinin 52 (%2.3) tanesi sayısal anomali iken, 46 (%2.1) tanesi yapısal anomalidir. Sayısal anomaliler içinde en sık görülen karyotip Trizomi 21 iken yapısal anomaliler içinde kromozom 9'un perisentrik inversiyonudur. Endikasyonlara göre en sık kromozom anomalisi saptanan ilk üç grup sırasıyla anormal ultrasonografik bulgu (%8.8), ileri anne yaşı-ÜTYR (%5.1) ve ileri anne yaşı (%3.1)'dır. En sık prenatal tanı endikasyonunu oluşturan grupta (üçlü testte yüksek risk) kromozomal anomali görülme oranı %2.6 olarak tespit edildi.

Sonuç: Çalışmamızda üçlü testte yüksek risk (%36), anormal ultrasonografik bulgu (%21) ve ileri anne yaşı (%21), prenatal tanı yapılan tüm gebeler için en sık görülen endikasyonlardır. Tüm olgularda elde ettiğimiz kültür başarısı %96.6'dır. Prenatal tanı için sitogenetik çalışma yapılan ve sonuç verilen gebelerin %4.4'ünde kromozom anomalisi saptanmıştır.

Anahtar Sözcükler: Koryon villus örneklemesi, amniyosentez, kordosentez, kromozom anomalisi.

Introduction

The primary aim in prenatal diagnosis is to diagnose as early as possible and to make the necessary decision according to the result. The important thing is not to regard the methods applied as a tool to end the pregnancy, but to obtain the right information about the fetus and help the family to make their own decision in accordance with the personal, social and ethical principles.[1] Prenatal diagnosis methods are divided into two parts called invasive and non-invasive methods. The most important ones of the non-invasive methods are ultrasound studies and biochemical tests done on the blood of mother. With the multi-centered studies including many European countries the effectiveness of USG in prenatal diagnosing was examined and it was shown that 50% of USG findings and fetal syndromes can be diagnosed without using other methods.[2,3] Nowadays, in the second trimester (14-22 weeks), Triple test consisting of AFP, total HCG and unconjugate Estriol level values is a commonly used prenatal scanning test.[4] In addition, quadruple test formed by adding inhibin-A to these parameters and in the first trimester, nuchal test in which PAPP-A (pregnancy associated placental protein-A), B-hCG free beta hCG and nuchal thickness are evaluated together are done. That scanning tests are non-invasive and economic has reduced the necessity of using invasive methods.

It has become possible to obtain knowledge about fetal karyotype through the invasive methods used in prenatal diagnosis. In the first and second trimesters, in order to prenatal diagnosis, Chorion Villus Sampling (CVS), Amniocentesis (AS) and Cordocentesis (CS) have been applied as the invasive classical methods performed these days. Each method is different in terms of time of feasibility, convenience of feasibility, period of getting laboratory results and complications. Amniocentesis is an invasive method which is done between the 16-20th weeks and often used in prenatal diagnosis. Ager and Oliver have stated in their intermediate evaluations that the risk of fetal loss has increased by 0.2-2.1% in the amniocentesis group in comparison with the control group.[5,6] Chorion Villus Sampling (CVS) has been preferred because it can be performed early (at about the 8th week of pregnancy), there is no direct intervention in fetus and so no hurt, and so much material can be obtained, which is regarded as an advantage for the DNA studies. In the CVS material, both cells at the metaphase or other stages can be directly evaluated and cytogenetic studies can be done following culture examinations.[7,8] Smidt-Jensen et al. found the fetal loss risk as 2.5% at transcervical approach, 2.3% at transabdominal approach and they determined that the difference between them was meaningless.[9] CS or cord blood sampling (from 21st week on) is an indis-

pensable method for prenatal diagnosis studies. In the cases of being late for applying for the prenatal diagnosis and being unsuccessful with AS, CS comes into effect. Although it is known that in problematic pregnancies, the fetal mortality depending on invasive procedure may be higher, it is accepted that common average is 1-2%.[10,11]

In this study, the results of the cytogenetic analysis done with the aim of prenatal diagnosis in the Department of Medical Genetics in Erciyes University Medical School between 2001-2007 (first six months) have been evaluated retrospectively.

Methods

Between the years of 2001 – 2007 (first six months), in the Department of Gynecology and Obstetrics of Gevher Nesibe Research Hospital and other hospitals the records of 2295 pregnant women from whom the samples were taken after doing chorion villus sampling, amniocentesis and cordocentesis with the aim of prenatal diagnosis, and whose samples were given a chromosome analysis were retrospectively studied in terms of the success of cell culture, invasive indications and their genetic results.

All the pregnant women and their husbands were informed of the procedure and possible complications before the application, and a written consent was taken from the couples who had accepted the application. All the pregnant women were examined in terms of being a hepatitis porter and having an Rh disagreement. A detailed genetic sonogram was done. The chorion villus sampling was performed with the transabdominal chorion villus sampling method technique and about 10 mg of fetal tissue was taken into the transport medium.[12] The amniocentesis was done in accord with the classical amniocentesis rules on the 16th–20th weeks. In order to reduce the maternal contamination, the first 2ml was aspired into a separate injector. Then a total of 18–20 ml of amniotic liquid was taken in to two different injectors. Cordocentesis was performed by taking 2 cc of fetal blood into the injector which has 0.5 cc heparin, depending on the localization of placenta, either from the free cord or from the spot 1–2 cm away from the place where the cord enters the placenta between the 19th – 28th weeks of pregnancy.[12] At the end of all these applications, the unsensitised pregnant women who have Rh incompatibility were given 300 microgram of anti-D immunoglobulin G.

The samples taken for the cytogenetic studies were cultivated in proper methods and harvested. For the evaluation of the numeral and structural disorder of the chromosomes in all the cases, at least 20 metaphase plates were examined with the computerized analysis system.

Results

The indications and average ages at which the invasive procedures were settled and pregnancy weeks of the pregnant women whose prenatal diagnostic applications had been made were shown in the table 1. High risk in triple test (n=835), abnormal ultrasonographic examination (n=493) and advanced maternal age (n=490) are the leading indications in the triple test in all the prenatal diagnostic applications. While in the cases to whom amniocentesis was applied, the most frequent indication is the high risk in triple test (n=816), in the cases to whom CS and CVS were applied the abnormal ultrasonographic examination (n=816) took the first place.

The result couldn't be given to 79 out of 2295 cases (3.4%) who were sent with the aim

Table 1. Indications, average age and pregnancy weeks of the pregnants that performed prenatal diagnosis.

Indication of prenatal diagnosis	CVS	AS	KS	Total	Percent
Triple Test Risk		816	19	835	36
Abnormal USG	45	338	110	493	21
Maternal age risk		481	9	490	21
Maternal age risk-Triple test risk		314	5	319	14
Down syndrome in the family history	3	61	3	67	3
Dysmorphic child in the family history	4	41	3	48	2
Child with muscular disorders in the family history		12		12	0,5
Repeated pregnancy loss		7		7	0,3
Others *	2	16	6	24	1
TOTAL	54 (%2)	2086 (%91)	155 (%7)	2295	
Mean mother age	27.84	31.17	27.15		
Mean pregnancy week	12;57	18.95	25.61		

**Others; IUGR, double test risk, mother anxiety, child with chromosomal abnormality in the family history, toxoplasmosis, drug using in the pregnancy, intrauterine transfusion, Rh incompatibility*

Table 2. Chromosomal abnormalities in all pregnants.

Caryotype	CVS	AS	CS	Total
47,XY,+21 veya 47,XX,+21	4	24	3	31
46,XX,inv9(p11;q12) or 46,XY,inv9(p11;q12)		13		13
47,XY,+18 or 47,XX,+18		4	3	7
46,XY,16qh+ or 46,XX,16qh+	1	4	1	6
45,X		3		3
47,XXX		1	2	3
45,XY,der(13;14)(q10;q10)		3		3
46,XY,15ps+ or 46,XX,15ps+		3		3
47,XY,+13 or 47,XX,+13	1	1		2
69,XXX		1	1	2
46,XX,14ps+		2		2
46,XX,21ps+ or 46,XY,21ps+		2		2
46,XY,22ps+ or 46,XY,22ps+		2		2
46,XX[95]/47,XX,+18[5]			1	1
47,XY,+mar		1		1
47,XXY		1		1
46,XY[84]/47,XYY[16]		1		1
46,XX,der(14;21)(q10;q10),+21		1		1
46,XX,der(17)t(10;17)(q24.2;p13)mat		1		1
46,XX,der(9)t(7;9)(p15.3;p24)mat,16qh+			1	1
46,XX,t(1;3)(q23;21)		1		1
46,XX,t(1;16)(p13.3;p13)			1	1
46,XY,t(4;9)(pter;q34)		1		1
46,XX,t(12;22)(p11.2;p12)		1		1
46,XY,t(16;17)(q13;q23)		1		1
46,XY,t(7;15)(q11,2;q26.3)		1		1
46,XX[60]/46,XY[40]		1		1
46,XY[80]/46,XX[20]		1		1
46,XX,inv9(p11;q12),15ps+		1		1
46,XY,9qh+		1		1
Total	6	77	13	96

of prenatal diagnosis: These were 64 out of 2086 cases to whom amniocentesis was applied (3%), 10 out of 155 cases to whom cordocentesis were applied (6.4%), 5 out of 54 cases to whom CVS was applied (9.2%). The culture success we obtained from these cases was 96.6%.

Chromosome anomaly was determined in 98 out of 2216 cases (4.4%) on whom cytogenetic studies were done for prenatal diagnosis and to whom the results were given. While 52 of these chromosome anomalies (2.3%) were numerical anomalies, 46 (2.1) were structural anomalies (Table 2). While the most commonly karyotype seen among numerical anomalies is trisomy 21, the one among structural anomalies is the pericentric inversion of chromosome 9. The three groups in which the most common chromosome anomaly was determined according to the indications were abnormal ultrasonographic examination (8.8%), advanced maternal age-triple test risk (5.1%) and advanced maternal age respectively. In the group which formed the most common prenatal diagnosis indication (the high risk in the triple tests), the rate at which chromosome anomaly can be seen was determined as 2.6%. According to the indications of the pregnant women who were given prenatal diagnosis, the frequency at which chromosome anomaly can be detected was shown in Table 3.

Discussion

In our work, the high risk in the triple test (36%), abnormal ultrasonographic examination (21%) and advanced maternal age (21%) are the most commonly seen indications for the pregnant mothers given a prenatal diagnosis. In the literature, there are varied rates in the studies where the amniocentesis indications have been evaluated. The first three most frequent indications in the work of Sener et al. are the same as the ones in our work.[13] While the first three indications in the work of Kose et al. are the advanced maternal age (42.3%), pathology in the second scanning test (28.3%) and pathologic ultrasound finding (8.6%) respectively, the first three indications in the work of Guven et al. are the triple test with a high risk, anomaly seen in the ultrasonogram and advanced maternal age.[14,15] When the frequency of cordocentesis indications in the literature were studied, Guven et al. showed the advanced age and Yayla et al. showed the abnormal ultrasonographic examination as the most frequent indication.[15,16] In our work, abnormal ultrasonographic examination has taken the first place.

Table 3. Chromosomal abnormality ratio according to their indication.

Indication of Prenatal Diagnosis	Number of pregnant women	Number of fetus with chromosomal abnormality	Percent of fetus with chromosomal abnormality (%)
Üçlü testte yüksek risk (ÜTYR)	805	21	2.6
Anormal ultrasonografik bulgu	475	42	8.8
İleri anne yaşı	471	15	3.1
İleri anne yaşı-ÜTYR	308	16	5.1
Down sendromlu çocuk doğurma öyküsü	67	1	1.5
Anomalili çocuk doğurma öyküsü	48	1	2
Kas hastalıklı çocuk doğurma öyküsü	11	0	0
Tekrarlayan gebelik kaybı	7	0	0
Diğerleri	24	2	8
Toplam	2216	98	4.4

When all the cases to which the prenatal diagnosis had been evaluated, 79 of 2295 patients couldn't be given a result. The culture success we obtained is 97% in AS, 93.6% in CS and 90.8% in CVS. That is totally 96.6%. It has been stated in the literature that the AS culture success of Cengizoglu et al. is 99%, the amniocentesis culture success of Guven et al. and Yuce et al. is 98% and the AS culture success of Yayla at al is 92.7%, their cordocentesis culture success is 85%.[17,15,18,16] Their cordocentesis and fetal karyotyping success is about 90%.[19] In the literature, the culture success in CVS samples of Türkyılmaz et al. is 88%. We think that the culture failure has been due to the contaminations of the amnion liquid during the material extraction, earlier bleeding, insufficient material extraction, contamination, sample keeping and problems during the transport conditions.

The chromosome anomaly rate seen in all our pregnant women who have been given prenatal procedures is 4.4%. The chromosome anomaly rate seen in AS cases in the Literature is between 2-5.8% (the chromosome anomaly rate in AS series of Yayla et al. is 3.6%, that of Basaran et al. is 3.5%, that of Guven et al. is 2%).[16,20,15] The chromosome anomaly rate seen in the cordocentesis cases is 8.2-15.25%.[21,15,16] Turkyılmaz et al. determined that the chromosome anomaly rate in the chorion villus sampling is 8%.

The frequency at which chromosome anomaly is seen in the pregnant women who have been given AS because of the abnormal ultrasonographic examination varies from 8.7% to 35.6%.[22,23,16,24] The 8.8% rate determined in our work seems to comply with the literature. And this also shows how important especially a detailed ultrasonogram scanning is. Karyotype anomaly was found in 2.6% cases of the patients who had been given amniocentesis and cordocentesis because of the triple test with a high risk. This rate varies between 1.5% and 10 in the literature.[13,14,16] It is thought that this wide range is due to the threshold value and the standardization difference between the laboratories. As Sener et al. stated, the importance of a triple test must be questioned by the other centers. While the frequency at which the chromosome anomaly is seen in the pregnant women who have been given a chromosome analysis owing to the indications of the triple test with a high risk is 2.6%, this frequency has become 5.1% at the advanced maternal age – triple test risk. We think that this is because the frequency at which down syndrome appears together with advanced age has increased.

The reason in 51-60% of the recurrent abortions is the chromosome anomaly.[25,26] In our work, the 7 pregnant women who had recurrent abortions were directly given AS, and the karyotypes of these 7 women were found to be normal.

Conclusion

The majority of indication was high risk in triple screening test (%36), abnormal ultrasonographic examination (%21), and advanced maternal age (%21) in all pregnant, respectively. Tissues cultures were successful in %96.4 of cases. Chromosome aberration were detected in %4.4 of cases.

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Maternal Anemia and Perinatal Outcome

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Abstract

Objective: Maternal anemia during pregnancy is reported to be associated with fetal complications such as intrauterine growth restriction, preterm birth, low birth weight, and maternal complications such as preeclampsia and eclampsia. The purpose of our study was to investigate perinatal complications associated with maternal anemia.

Methods: The mean Hgb concentration in G1 was 7.63 (± 0.34) gr/dl, in G2 it was 11.82 (± 1.23). Preterm birth rate in G1 was 9.9% (n:16) while it was 3.2% (n:5) in G2. Preeclampsia was found as 8.6% (n:14) in G1 and 3.2% (n:5) in G2. 14 (8.6%) intrauterine growth restriction cases were present in G1, while 7 (%4.3) cases were present in G2. While G1 had a single case of placental ablation, G2 had no cases of ablation. No cases of eclampsia was reported in neither group. Neonatal Care Unit admission was 13.6% n:22 in G1 and 8.2% (n:13) in G2. Preeclampsia and preterm labor rates were significantly higher in anemic group statistically.

Results: 162 pregnant women with 2. trimester hemoglobin (Hgb) levels equal or under 8 gr/dL (Group 1:G1) and 160 pregnant women with 2. trimester Hgb levels equal or over 10 gr/dL (Group 2:G2) were included in our study. Data were collected retrospectively from the patient files. Preterm birth, preeclampsia, eclampsia, intrauterine growth restriction and admission to neonatal intensive care unit records were investigated.

Conclusion: Preconceptional evaluation along with a planned pregnancy is important in decreasing the frequency of maternal anemia. Larger study groups are necessary to evaluate the association of maternal anemia and perinatal outcomes. Diagnosis and treatment of maternal anemia is important to minimize the perinatal complications.

Keywords: Pregnancy, anemia, preeclampsia, eclampsia, intrauterine growth restriction.

Maternal Anemi ve Perinatal Sonuçlar

Amaç: Gebelikte maternal aneminin intrauterin gelişme geriliğinin, preterm doğum, düşük doğum ağırlığı gibi fetal; preeklampsi, eklampsi gibi maternal komplikasyonlar ile ilişkili olabileceği bildirilmektedir. Çalışmamızın amacı maternal anemi saptanan gebelerdeki perinatal komplikasyon sıklığını araştırmaktır.

Yöntem: Çalışmaya 2. trimesterde hemoglobin düzeyi 8 gr/dl altında olan 162 gebe (Grup 1) ve hemoglobin düzeyi 10 gr/dl'nin üzerinde 160 gebe (Grup 2) dahil edildi. Veriler retrospektif olarak hasta takip kartları ve dosyalardan elde edildi. Preterm doğum, preeklampsi, eklampsi, intrauterin gelişme geriliği ve yeni doğan ünitesine kabul oranları incelendi.

Bulgular: Grup 1'de ortalama Hg konsantrasyonu 7.63 (± 0.34) gr/dl, Grup 2'de 11.82 (± 1.23) olarak saptandı. Preterm doğum oranı Grup 1'de %9.9 (n:16) iken Grup 2'de %3.2 (n:5) idi. Eklampsi oranı Grup 1'de % 8.6 (n:14) iken, Grup 2'de % 3.2 (n:5) idi. İntrauterin gelişme geriliği Grup 1'de 14 iken (%8.6), Grup 2'de ise 7 (%4.3) idi. Grup 1'de sadece 1 olguda plasenta dekolmanı (ablatio) ortaya çıkarken, Grup 2'de plasenta dekolmanı izlenmedi. Yine her iki grupta eklampsi gözlenmedi. Yeni doğan ünitesinde takip oranı ise Grup 1'de %13.6 iken (n:22), Grup 2'de ise %8.2 (n:13) idi. Anemik olan grupta preeklampsi ve preterm eylem gelişimi istatistiksel olarak anlamlı derecede farklı idi.

Sonuç: Prekonsepsiyonel değerlendirme ile birlikte uygun bir gebelik planlanması maternal aneminin sıklığının azaltılmasında önemlidir. Maternal anemi düzeyi ve perinatal sonuçların ilişkisini incelemek için daha büyük gruplara gereksinim vardır. Antenatal takipler sırasında maternal aneminin tespiti ve tedavisi, perinatal komplikasyonların en aza indirilmesi için önemlidir.

Anahtar Sözcükler: Gebelik, anemi, preeklampsi, eklampsi, intrauterin gelişme geriliği.

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Introduction

In pregnancy, and especially in developing countries, one of the most encountered problems is the maternal anemia. The prevalence of anemia during pregnancy period has been reported between 35 – 100% in various studies.[1] There are various opinions on the maternal and perinatal effects of anemia. World Health Organization (WHO) stated that the 20% of the maternal mortalities have been influenced by anemia.[2] When the maternal changes during the pregnancy have been observed, maternal cardiac output is seen to increase by 50% to provide the necessary placental blood flow to support fetal development. For this, plasma volume needs to be increased. This increase in plasma volume arises as the dilutional anemia of the pregnancy.[3-4] This anemia especially arises during the early pregnancy and continues until term. The association of maternal anemia during pregnancy with fetal intrauterine growth restriction and low birth weight, and maternal preeclampsia and eclampsia has been proposed.[5-7] Various studies showed no association with bad perinatal outcome.[8] The purpose of our study is to evaluate the effects of anemia on the perinatal complications on our population.

Methods

This study included 162 pregnant women with 2 nd trimester Hgb levels ≤ 8 gr/dL (G1) and 160 women with 2nd trimester Hgb levels? 10 gr/dL (G2) who have followed in the antenatal care unit of our tertiary center, Gulhane Military Medical Academy, between January 2003 and December 2006. Data have been acquired retrospectively from the patient files. Multiple pregnancies and patients who had pregestational systemic diseases (hypertension, diabetes mellitus, renal disease etc.) have been excluded from the study group. In the center where this study was conducted, every pregnant women is started on oral and/or oral iron supplemenation at the 2nd trimester according to the routine antenatal follow up protocols.

In this study we evaluated the preterm labor, preeclampsia, eclampsia, intrauterin growth restriction and neonatal care unit admission rates of the anemic and non anemic mothers. SPSS 13.0 for Windows was used for the statistical analysis. Defining statistics were mean -/+ standart deviation. For comparing the 2 groups' preterm labor, preeclampsia,eclampsia and neonatal intensive care unit admission rates Chi square test was used. A p value under 0.05 was considered significant.

Results

The demographics of the two groups are shown at table 1. Mean Hgb concentrations of G1 and G2 were 7.63 (-/+ 0.34) gr/dl, and 11.82 (-/+ 1.23)gr/dL. G1 had a normal delivery rate of 69.8% (n:113), and cesarean rate was 30.2% (n:49). Normal delivery rate of G2 was 72.5% (n:116), and cesarean rate was 27.5% (n:44). Preterm delivery rates of G1 and G2 were 9.9% (n:16) and 3.2% (n:5) respectively, (p:0.02) . Preeclampsia rates of G1 and G2 were 8.6% (n:14) and 3.2% (n:5) respectively (p:0.05) During antenatal follow up, G1 and G2 had 14 (8.6%) and 7 (4.3%) intrauterine growth restriction cases respectively, (p: 0.17). 18 (11%) and 17 (10.6%) cases in G1 and G2 respectively were found to have meconium in their amniotic fluid, (p:0.51). G1 had 1 case of placental ablation while G2 had no placental ablation cases. Neither of the groups had eclampsia. Neonatal intensive care unit admissions for G1 and G2 were 13.6% (n:22) and % 8.2 (n:13) respectively (p: 0.15) (Table 2).

Discussion

We evaluated the maternal adaptation to pregnancy and perinatal outcomes of pregnant women who had anemia in the 2nd trimester of pregnancy. Our results show that preeclampsia

Table 1. Dempgraphic features of the patients groups which anemic and non- anemic during second trimester.

	Group 1 (Anemic) n: 162		Group 2 (Non- anemic) n: 160		
	Mean	**Standart deviation**	**Mean**	**Standart deviation**	**p**
Age (year)	28.3	4.1	27.6	3.8	AD*
BMI	23.6	2.6	23.2	2.4	AD*
Hg concentration (g/dl)	7.63	0.34	11.82	1.23	<0.05
	n	**%**	**n**	**%**	**p**
Smoking	32	19.8	27	16.8	AD*
Delivery					
Abdominal	49	30.2	44	27.5	AD*
Vajinal	113	69.8	116	72.5	AD*

**NS: Non- Significant. (p< 0,05 was accepted as statistically significant)*

Table 2. Perinatal outcomes of the patients groups which anemic and non- anemic during second trimester.

	Group 1 n: 162		Group 2 n: 160		
	n	**%**	**n**	**%**	**p**
Preterm Birth	16	9.9	5	3.2	0.02
Preeclampsia	14	8.6	5	3.2	0.05
IUGR	14	8.6	7	4.3	0.17
Meconium in amniotic fluid	18	11.1	17	10.6	0.51
Follow Up in Neonatal Unit	22	13.6	13	8.2	0.15

and preterm birth rates are higher in the anemic group than the normal hemoglobin group. Although intrauterine growth restriction, neonatal care unit admission and meconium stained amniotic fluid rates were higher in the anemic group than the normal group, there were no statistical significance.

Lone FW et al studied 626 pregnant women and found that preterm birth risk was 4 times, low birth weight risk was 1.9 times, low APGAR score was 1.8 times and intrauterine fetal death was 3.7 times more common in anemic pregnant women compared to non anemics.[9]

Levy A et al. in their retrospective study, evaluated the preterm birth and birth weights of the anemic pregnant women and determined the maternal anemia as an independent risk factor for preterm birth and low birth weight, no association was found with bad perinatal outcome in their study.[8] Bondevik GT et al.in their case control study on 1400 pregnant women, used the first antenatal visit hematocrit levels as parameter, and concluded that low birth weight and preterm birth rates were significantly higher when the maternal hematocrit was under 24%.[10]

Malhotra M et al grouped 447 pregnant women into 4 groups according to their anemia levels, compared them for maternal and perinatal outcome and postpartum complications. They reported that severe anemia increased the risk for low birth weight, and mild anemia had the best maternal and perinatal outcome.[11] Murphy JF et al indicated to the association between higher hemoglobin levels, preterm birth and low birth weight.[12] Some studies

reported increased hematocrit levels associated with fetal growth restriction and increased preterm birth rates.[13-14]

Patra S et al reported the maternal and perinatal outcomes of 130 severely anemic pregnant women who had 5 gr/dl or lower hemoglobin. The hemoglobin levels were acquired at the 3 rd trimester and 81 % of their population were multiparas. Pregnancy intervals for multiparas was found to be 16. 5-/+ 0.5 months, and following outcomes were reported: preterm birth rate 69.2%, preeclampsia 17%, eclampsia 4%, placental ablation 3%, fetal distress 23%, low birth weight 24.6 % and neonatal death rate 35%.[15] They concluded that especially in multiparas when the pregnancy intervals were short and nutritional support was insufficient, pregnancy complications associated with maternal anemia were more commonly encountered.

Conclusion

Appropriate pregnancy planning and preconceptional evaluation is important to decrease maternal anemia. The diagnosis and treatment of maternal anemia in the antenatal follow up is critical to minimize perinatal complications. Our study showed a significant association between anemia and preterm birth and preeclampsia, still larger studies with more cases showing this association with are required.

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Evaluation of the Effects of Self-Care Capacity on Healthy Life Style Behaviors in Risky Pregnants

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Abstract

Objective: In this study; it is aimed to evaluate the effects of self-care capacity on healthy life style behaviors by determining the self-care capacities of pregnants applied to risky pregnant polyclinic.

Methods: Descriptive and cross-sectional type of this was performed in Ministry of Heath, Ege Maternity and Gynecology Training Hospital in Izmir in between October 2003 and May 2004. A written consent was taken from the establishment for performing the study. For data collecting tools, "Self-Care Capacity Scale" (SCC) (alpha=0.72) and "Healthy Life Style Behaviors Scale" (HLSB-1) (alpha=0.91) were used as well as survey forms including the socio-demographic, obstetric and medical histories of pregnants.

Results: Average SCC scores of pregnants were found as 85.17± 27.29 (min=35, max=140) and average HLSB total scores were found as 121.31±21.02 (min=48, max=192). When these averages are evaluated as to the minimum and maximum scores that should be taken from the scales, it can be said that they are higher than average level. Score averages of sub-scales of HLSB scale were examined in the study and it was found that the highest score average was from "Self-Actualization" sub-scale with a score of 35.49±7.17 and that the lowest score average was from "Exercise" sub-scale with a score of 8.32± 3.21. In the study, a significant relation (r=0.195, p=0.033) was found between SCC total score average and HLSB total score average in risky pregnants. Also, a significant relation was found statistically between SCC total score average and score average of "Self- Actualization" sub-scale of HLSB scale (r=0.193, p=0.036) and score average of "Health Responsibility" sub-scale (r=0.190, p=0.039).

Conclusion: It is found that there is a positive correlation (p=0.03) between self-care capacities and healthy life style behaviors of pregnants. It can be said that there is an increase in healthy life style behaviors of risky pregnants as their self-care capacities increase.

Keywords: Risky pregnant, Self-care capacity, healthy life style behaviors.

Riskli gebelerde öz-bakım gücü'nün sağlıklı yaşam biçimi davranışlarına etkisinin incelenmesi

Amaç: Bu çalışmada; riskli gebe polikliniğine başvuran gebelerin öz-bakım gücü düzeylerini belirleyerek, bunun sağlıklı yaşam biçimi davranışlarına etkisinin incelenmesi amaçlanmıştır.

Yöntem: Tanımlayıcı ve kesitsel tipte olan bu çalışma, Ekim 2003–Mayıs 2004 tarihleri arasında, İzmir'de bulunan Sağlık Bakanlığı Ege Doğumevi ve Kadın Hastalıkları Eğitim Hastanesi'nde yapılmıştır. Çalışmanın yapılabilmesi için kurumdan yazılı izin alınmıştır. Veri toplama aracı olarak gebelerin sosyo-demografik, obstetrik ve tıbbi öykülerini içeren anket formu yanı sıra, "Öz-Bakım Gücü Ölçeği" (ÖBG) (alfa=0.72) ve "Sağlıklı Yaşam Biçimi Davranışları Ölçeği" (SYBD-1) (alfa=0.91) de veri toplamada kullanılan diğer araçlardır.

Bulgular: Gebelerin ÖBG puan ortalaması 85.17±27.29 (min=35, max=140) ve SYBD toplam puan ortalaması 121.31±21.02 (min=48, max=192) olarak belirlenmiştir. Bu ortalamaların, ölçekten alınması gereken minimum ve maksimum puanlara göre değer-

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lendirildiğinde orta düzeyin üzerinde olduğu söylenebilir. Çalışmada SYBD ölçeği alt ölçekler puan ortalamaları incelenmiş ve en yüksek puan ortalamasının 35.49± 7.17 ile "Kendini Gerçekleştirme" alt ölçeğine ait olduğu, en düşük alt ölçek puan ortalamasının ise 8.32±3.21 ile "Egzersiz" alt ölçeğine ait olduğu saptanmıştır. Çalışmada riskli gebelerde ÖBG toplam puan ortalaması ile SYBD toplam puan ortalaması arasında (r=0.195, p=0.033) anlamlı bir ilişki elde edilmiştir. Riskli gebelerin ÖBG toplam puan ortalaması ile SYBD ölçeği alt ölçek maddelerinden "Kendini Gerçekleştirme" alt ölçeği puan ortalaması (r=0.193, p=0.036) ile "Sağlık Sorumluluğu" alt ölçeği puan ortalaması arasında (r=0.190, p=0.039) istatistiksel olarak anlamlı ilişki olduğu saptanmıştır.

Sonuç: Gebelerin öz bakım gücü ile sağlıklı yaşam biçimi davranışları arasında pozitif bir korelasyon olduğu (p=0.03) saptanmıştır. Riskli gebelerin öz bakım gücü yükseldikçe sağlıklı yaşam biçimi davranışlarında artma olduğu söylenebilir.

Anahtar Sözcükler: Riskli gebe, öz bakım gücü, Sağlıklı yaşam biçimi davranışları.

Introduction

When morbidity and mortality risks increase in mother or fetus at a significant level, than gestation is taken up as a high risked gestation. In order to reach the highest level of a healthy perinatal result, it is important to establish the risk factors at an early period in terms of applying appropriate treatment at the right time.[1]

The most important criteria showing the health levels of societies and evaluating the services given in this field are mother-baby death and disease rates. These rates may differ according to the development levels of states. Even though there are positive developments, it is seen that desired level has not been reached yet in terms of mother-baby mortality rate in our country, which is among the developing countries. 83% of mothers in our country pass away due to obstetric reasons directly belonging to gestation and delivery.[2] The most important characteristic of deaths directly related with gestation and delivery is that 75-80% of risks and deaths are preventable by early diagnosis and care.[3]

In recent years, individual care (self-care) concept has come into prominence as protecting, maintaining and developing health, the philosophy of basic health services, becomes important more than the treatment of disease.

Individual care (self-care) is basic human requirements that should be met by everyone. When these requirements are not met, care deficiency and impairment of health appear.[4] Self-care which is one of the main concepts of general nursing theory of Orem that is one of theories most used in nursing training, practice and research is defined as "To perform activities that individuals have to do for protecting their lives, healths and wellbeings".[5]

There is requirement for self-care in order to maintain every period of life healthy. One of the periods that self-care is required for is pregnancy. With a study, it is proved that healthy lifestyle profile during gestation decreased the risk for low-weighted newborn and that healthy lifestyle profile (HPLP) had a vital importance for a healthy newborn accordingly.[6] At that period, it is required to protect, maintain and increase the healths of pregnant and fetus. In order to provide that, pregnant should have regular antenatal controls and give importance to her self-care.[7]

During the maintenance of health, activities that encouraging individual to reach the highest level of health aim to protect, maintain and increase the health of individual. As there is avoiding from attitudes and behaviours that will corrupt the health in protecting and maintaining the health, there are using capacity and energy of individual, living a satisfying life, being productive and having the ability to use capacities to the last in increasing health.[8]

Individual has an active role in increasing health, displaying a healthy lifestyle and performing activities related with this lifestyle.

Healthy lifestyle activities or behaviours are self-actualization, health responsibility, exercise, nutrition, interpersonal support and stress management. All these activities and behaviours get more importance during gestation, which is a special period in the life cycle of woman.[7]

Nurses have important responsibilities in increasing the self-care agency at pregnancy. Responsibilities of midwives and nurses working in obstetric policlinics and mother-child health sector for self-care and increasing healthy lifestyle profiles are teaching the care to pregnants, consulting and training them.

The aim in this study is to research the effects of self-care agency on healthy lifestyle profiles by determining the self-care capacities of pregnants applied to risky pregnant policlinic.

Methods

Descriptive and cross-sectional type of this was performed in Ministery of Health "Ege Women Disease and Labour Education and Research Hospital" in Izmir. Data of the study was collected in between October 2003 and May 2004. A written consent was taken from the establishment for performing the study. The number of pregnants applied to "Risky Pregnant Policlinic" is not known since all policlinic records are kept in common in the computer system of the hospital. Thus, population was found as 369 (risks such as being primipara are excluded) when calculated with a formula of individual number to be taken by sampling in cases that incidence rate is known (60%) but individual number in the population is not known; sampling of 119 pregnants who accepted to join the study and filled survey forms completely.[9] Sampling reflects 32.25% of the population.

As a data collection tool, survey forms are used including the socio-demographic, obstetric and medical histories of pregnants prepared by researchers within the literature knowledge. Also, "Self Care Agency Scale" (ESCA) (alpha=0.72) is used for determining self care agency of pregnants which is developed by Kearney and Fleischer in 1979 and adapted by Nahcivan for Turkish Society in 1993.[4]

"Health Promoting Lifestyle Profile Scale" (HPLP-1) (alpha=0.91) which was developed by Pender in 1987 in order to determine healthy lifestyle behaviours of pregnants and was adapted by Nihal (Ozabaci) Esin for Turkish society in 1997, is another scale used for data collection.[10]

Data of the study is coded and analysis in SPSS 11.0 package program. In evaluating obtained data; number and percentage distributions were done and relation between dependent and independent variables were evaluated with correlation and Student t tests.

Results

Socio-demographic characteristics of pregnants were evaluated in the study and it was found that 31.9% of them were in 25-29 age groups and the mean age of women was 29.54±6.26 years and that 37.0% of their spouses were 35 years and above.

When education status which has an important role for self-care of pregnants were evaluated; it was found that 53.8% of pregnants were graduated from primary school and that 49.6% of them even could not graduated from primary/secondary school.

According to study results; 84.9% of pregnants stated that they did not have any jobs. "Income status" of pregnants were asked in terms of continuity of gestation and affecting the result and it was found that 72.3% of them perceived that their income-expenditure status were "equal". It was found that 64.8% of pregnants was living in a metropolis/city and family type of 89.9% of them was "nuclear family".

It was found that 12.6% of pregnants who applied to risky pregnant policlinic was relative to her husband and 14.2% of them were the mean of smoking 6.70±4.44 pcs/day for averagely 10.26±5.17 years.

Distributions of some risky pregnants as to their obstetric characteristics are shown in Diagram 1. The mean of gestation number of pregnants who joined the study is 2.47±1.36 and their mean of deliveries are 1.36±0.58 (Diagram 1). In the study, the mean of total delivery (alive + dead delivery) is 1.46±0.68 (Diagram 1).

The mean of miscarriage/abortion number of risky pregnants who joined the study is 1.55±0.92 and the mean of gestational week is 25.36±9.27. It was also found that there is averagely 6 years (59.05±49.77 months) between last two pregnancies (Diagram 1).

As desiring the pregnancy (which may affect the self-care of individual during pregnancy) is 83.2%, not desiring the pregnancy is 16.8%. Distribution of pregnants according to their risk factors who applied to risky pregnant policlinic is shown in Diagram 2. According to that, it was found that 33.1% of pregnants have been observed due to "diseases existing before gestation" (Diabetes Mellitus [DM], Asthma, Anemia, Heart Failure, Epilepsia, Kidney Cyst, Varicosity, Hepatitis B, Thalassemia, Hypertension, Cholestasis etc.) 29.0% of pregnants are being observed due to "risk factors of gestation" (Threat of preterm delivery, preeclampsia, abortus imminence, oligohydramnios/polyhydramnios, multiple pregnancy, premature membrane rupture, cervical failure, postmaturity, urinary tract infection and Rh discord etc). 13.7% of pregnants are observed due to "risks occured due to socio-demographic factors". 12.9% of pregnants came to policlinic for observation was found as having congenital anomaly and intra uterine growth retardation (IUGR) due to "risks belonging to fetus". Other pregnants were observed due to "diagnosis, examination, bad history and undefined etc." and their rate was 11.3% (Diagram 2).

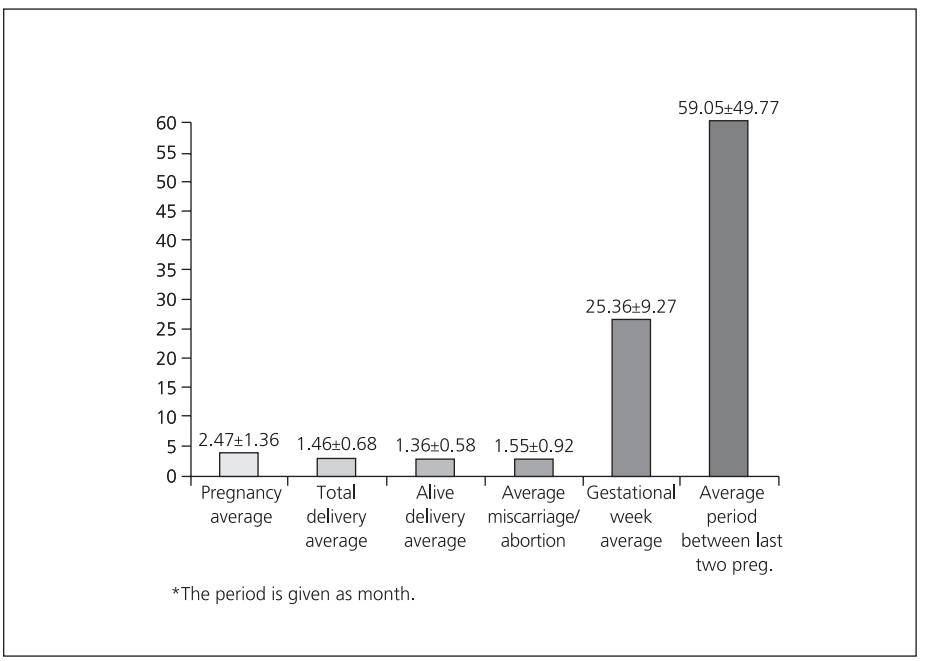

Diagram 1. Distributions of pregnants as to their some obstetric characteristics.

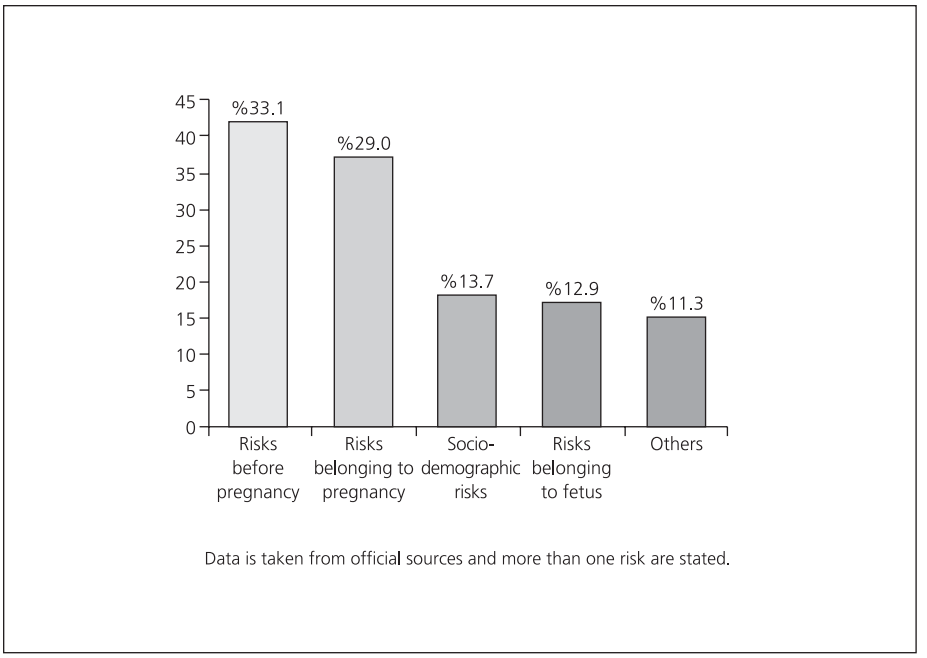

Diagram 2. Distribution of pregnants as to risk factors they have.

In Table 1, the mean of ESCA, HPLP and their sub-scale scores are seen. The mean of ESCA score of pregnants are determined as 85.17± 27.29 (min=35, max=140) (Table 1). The mean of HPLP total score of these pregnants are found as 121.31±21.02 (min=48, max=192) (Table 1). Score the mean of sub-scales of HPLP scale were examined in the study and it was found that the highest the mean of score was from "Self-Actualization" sub-scale with a score of 35.49±7.17 and that the lowest the mean of score was from "Exercise" sub-scale with a score of 8.32± 3.21.

Relation between HPLP scale the mean of score and sub-scale the mean of score and ESCA the mean of score are seen in Table 2. In the

Table 1. Distribution of mean score of ESCA, HPLP and sub-scales.

			Mean Scores have to be taken from scale	
	X – SD	**Min- Max**	**The lowest**	**The highest**
Self-care Agency Scale (ESCA) mean score	85.17± 27.29	9.00- 133.00	35	140
Mean Scores of HPLP and sub-scales				
HPLP total score	121.31± 21.02	70.00- 169.00	48	192
- Self-Actualization	35.49± 7.17	17.00- 52.00	13	52
- Health Responsibility	23.10± 5.80	11.00- 38.00	10	40
- Exercise	8.32± 3.21	5.00- 18.00	5	20
- Nutrition	17.44± 3.40	8.00- 24.00	6	24
- Interpersonal Support	20.38± 3.44	13.00- 28.00	7	28
- Stress Manage	16.54± 3.90	7.00- 27.00	7	28

study, a significant relation (r=0.195, p=0.033) was found between the mean of ESCA total score and the mean of HPLP total score in risky pregnants (Table 2). Also, a significant relation was found statistically between the mean of ESCA total score and score the mean of "Self-Actualization" sub-scale of HPLP scale (r=0.193, p=0.036) and score the mean of "Health Responsibility" sub-scale (r=0.190, p=0.039) (Table 2).

Relation between mean score that pregnants who joined the study got from ESCA and HPLP scales and the mean of age, the mean of gestation number and the mean of total delivery number is seen in Table 3. It was found that there was no significant relation between the mean of age (r=0.059, p=0.523), the mean of gestation number (r=0.054, p=0.557) and the mean of total delivery number (r=0.044, p=0.707) of pregnants according to the mean of ESCA scale score. Also no significant relation was found between the mean of age (r=0.114, p=0.217), the mean of gestation number (r=-0.101, p=0.276) and the mean of total delivery number (r=0.082, p=0.483) in pregnants according to HPLP scale the mean of score (Table 3). Relation between sub-scale items of HPLP scale of pregnants in the study and some obstetric characteristics of pregnants is also evaluated (Table 3). According to the statistical analysis made between sub-scale items of HPLP scale and some obstetric characteristics of pregnants; there is a positive relation (r=0.214, p=0.02) only between age of pregnants and "Nutrition" sub-scale of HPLP scale.

Table 2. Relation between the mean of HPLP score and the mean of ESCA ccore of risky pregnants.

	Self-care Agency Scale (ESCA)		
	r	p	n
Healthy Promotional Lifestyle Profile (HPLP)	0.195	0.033	119
- Self-Actualization	0.193	0.036	119
- Health Responsibility	0.190	0.039	119
- Exercise	0.066	0.478	119
- Nutrition	0.087	0.348	119
- Interpersonal Support	0.161	0.080	119
- Stress Management	0.143	0.121	119

Table 3. Relation between mean scores that Risky Pregnants took from ESCA and HPLP scales and the mean of age-pregnancy and total delivery.

	Age		Pregnancy		Total Delivery	
	r	p	r	p	r	p
ESCA	0.059	0.523	0.054	0.557	0.044	0.707
HPLP	0.114	0.217	-0.101	0.276	-0.082	0.483
- Self-Actualization	0.013	0.889	-0.105	0.258	-0.082	0.479
- Health Responsibility	0.081	0.383	-0.084	0.366	-0.054	0.646
- Exercise	0.163	0.077	-0.080	0.387	0.015	0.896
- Nutrition	0.214	0.020	-0.046	0.623	-0.075	0.519
- Interpersonal Support	0.081	0.384	0.002	0.979	-0.024	0.834
- Stress Management	0.079	0.394	-0.122	0.187	-0.131	0.259

The mean of total score of ESCA and HPLP scale of risky pregnants were also compared with some socio-demographic characteristics of pregnants such as age groups, education status, income status, the place they live, family relationship and job status, smoking and state of being pregnancy. No difference was found statistically between the mean of ESCA score of risky pregnants and age groups, education status, income status, the place they live, kinship and job status, smoking and state of being pregnancy (p>0,05). In statistical analysis, significant relation was found only between HPLP scale total score and job status (t=4.279, p=0.000).

In table 4, the mean of ESCA and HPLP total score and the mean of HPLP sub-scales scores are compared with risk status of pregnants. A significant relation was found between the mean of ESCA score and "Risks of gestation" (r=-2.428, p=0.017) in terms of risk status of pregnants in the study (Table 4). Also by comparing the mean of HPLP scale score with risk status of pregnants, it was found that there is statistically a significant relation between "Risks of gestation" (t=-2.505, p=0.014) and "Risks occurred due socio-demographic factors" (t=2.681, p=0.008). No significant relation was found in the statistical analysis between the mean of ESCA score and the mean of HPLP total score in terms of "risks occurred due to diseases before gestation", "risks belonging to fetus" and others titled as "diagnosis, examination, bad history and undefined etc" (Table 4). Relation between risk statuses was evaluated according to the sub-scales of HPLP scale of gestations that were included into the study (Table 4). According to the table, statistically a difference was found between "Health responsibility" sub-scale of HPLP and "Risks belonging to pregnancy" (t=-3.487, p=0.001) and "risks occurred due to socio-demographic factors" (t=2.683, p=0.008) (Table 4). A statistical difference was found between "Exercise" sub-scale of HPLP and "Risks belonging to pregnancy" (t=-2.002, p=0.04) and "risks occurred due to socio-demographic factors" (t=2.54, p=0.01) (Table 4). There was a significant difference between "Nutrition" sub-scale of HPLP scale and "risks occurred due to socio-demographic factors" (t=3.498, p=0.001) and "risks belonging to fetus" (t=-2.512, p=0.013) (Table 4). Statistically a significant difference was found between "Interpersonal Support" sub-scale and "Risks belonging to pregnancy" sub-scale of HPLP (t=-2.27, p=0.023) (Table 4).

Table 4. Comparison of ESCA and HPLP and sub-scales in risky pregnants with risk situations.

	Risks occurred due to diseases existing before pregnancy		Risks belonging to pregnancy		Risks occurred due to socio-demographic factors		Risks belonging to fetus		Others	
	t	p	t	p	t	p	t	p	t	p
ESCA	-1.041	0.300	-2.428	0.017	1.792	0.076	0.739	0.462	0.702	0.484
HPLP	0.094	0.921	-2.505	0.014	2.681	0.008	-0.484	0.629	1.381	0.170
Sub-scales score the means of HPLP of pregnants										
- Self-Actualization	-0.598	0.551	-1.250	0.214	1.265	0.208	-0.632	0.528	1.558	0.122
- Health Responsibility	0.981	0.329	-3.487	0.001	2.693	0.008	0.058	0.954	0.757	0.571
- Exercise	0.153	0.878	-2.002	0.048	2.540	0.012	0.900	0.370	-0.228	0.820
- Nutrition	0.834	0.374	-1.716	0.089	3.498	0.001	-2.512	0.013	1.152	0.252
- Interpersonal Support	0.455	0.650	-2.297	0.023	1.958	0.053	-0.872	0.385	1.801	0.074
- Stress Management	-1.107	0.270	-.851	0.397	1.190	0.236	0.636	0.526	1.046	0.298

Discussion

In this study performed on risky pregnants, it is an expected result that rates of pregnants being relative with their husbands and smoking are at a high level. When our study results are compared with the study performed by Okyay et al. in a Health Center in Aydin which is a western city as Izmir, the difference between two studies strengthens these results.[11] All pregnants who joined the study are risky. It is an expected result that the highest risk belongs to the risks occurred due to "diseases existing before pregnancy" at a rate of 33.1% according to the risk groups of pregnants.

In a research performed among adolescent pregnants, the mean of self-care agency score was found as 76.38±19.91, lower than study results.[5] This situation can be explained as adolescents are in risk category in terms of pregnancy due to the fact that they are still within the period of completing mental development spiritually. Eryilmaz found the mean of self-care agency as 93.2± 19.0 in the study in which effect of pregnancy number on self-care agency was evaluated.[7] The mean of self-care agency is 93.54±17.40 in Nahcivan's study performed on healthy adolescents.4 The reason of being higher of means in studies of Nahcivan and Eryilmaz than our study results that samplings in both studies are consist of healthy pregnants/individuals.

In the study of Sayan performed on working women, the mean of total score of healthy lifestyle profile were found as 122.50±14.57 and seems similar with our study results.[8] This result can be explained with the effect of cultural characteristics of the society on behaviours developing the health. In the study, the mean of score of risky pregnants that they took from sub-scales of HPLP scale showed parallelism with the study of Esin.10 It was found that total HPLP results were at a medium level in the study performed on Jordanian women and that the highest the mean of score were in "Self-Actualization" and "Health Responsibility" sub-scales and that the lowest the mean of score were in "Exercise" and "Stress Management" sub-scales.[12] These results showing similarity with our study results can be explained that both countries are Muslim and studies were performed on similar age groups. In another study performed on women with mastectomy, total HPLP score was found quite high as 162.60±13.81.[13] This situation can be explained that CA result of the study was taken and it was performed on patient group who were under control and having patient and thus they were more careful and attentive.

In the study, a significant relation was found between the mean of ESCA total score and the mean of HPLP total score of risky pregnants (r=0.195, p=0.033). This result shows that generally healthy lifestyle profiles increase as self care agency increases which has the ability to start or apply health activities in the literature.[14] In the study performed by Guner on women with mastectomy, a significant relation was found between total score the mean of HPLP scale and the mean of ESCA score.[13]

Significant relation found between the mean of ESCA total score and the mean of "Self-Actualization" score and "Health Responsi-bility" sub-scales of HPLP scale shows that self-care in risky pregnants is an important factor in terms of self-actualizing and taking health responsibility.

In the study performed by Sayan on working women, a significant relation was found between ESCA and HPLP scale total score and scores of all sub-scales except the "Exercise".[8] A significant relation was found statistically between "Self-Actualization" sub-scale of HPLP scale and ESCA in the study performed by Callaghan on adolescents.[15]

According to the sub-scales of HPLP, finding a positive relation between ages of pregnants

and "Nutrition" sub-scale of HPLP scale can be associated with the importance given to the nutrition during pregnancy in terms of cultural and traditional structure of our society. This result also makes us to think that positive nutrition habits increase as pregnancy age increases.

As to the study results; it can be said that pregnants having high total scale score for ESCA and HPLP contributes early diagnosing risks peculiar to pregnancy by comprehending the importance of prenatal visits and that those pregnants know that advance maternal age is a risk.

Conclusion

It was found in the study that pregnants constitute risk factor affecting both the mean of ESCA total score and the mean of HPLP total score who applied/observed for observation, diagnosis and treatment in Risky Pregnant Policlinic due to risks constituting "Factors belonging to pregnancy" in terms of risk status such as threat of preterm delivery, preeclampsia, abortus imminence, oligohydramnios/polyhydramnios, multiple pregnancy, premature membrane rupture, cervical failure, postmaturity, urinary tract infection and Rh discord etc. The mean of ESCA score of pregnants were found as 85.17±27.29 and the mean of HPLP score were found as 121.56±20.85. Because of the study, a positive correlation (p=0.03) was found between self care agency and health promoting lifestyle profile of pregnants. It can be said that as self-care capacities of risky pregnants increase, then there is an increase in their healthy lifestyle profile.

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Leptin Values in Maternal and Umbilical Cord Blood in Pregnant Women with Preeclampsia

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Abstract

Objective: To compare the maternal plasma and umbilical cord blood leptin values in the prenatal and postnatal periods of women with normal pregnancies and pregnant women with preeclampsia.

Methods: The prenatal and postnatal maternal plasma and umbilical cord blood leptin values in the preeclampsia group (n=40) with the patients selected to have similar body mass indexes and to be at the similar gestational weeks were compared with those of the normal pregnancy group (n=32).

Results: We found a significant difference in the maternal plasma leptin concentrations between the groups. The leptin concentration in the preeclampsia group was significantly high (p=0.048) . No difference in the umbilical cord blood leptin concentrations was detected (p>0.05).

Conclusion: We detected an increase in maternal plasma leptin concentrations in preeclamptic women independent from the pregnancy body-mass index. We found remarkable but non statistical difference of leptin values in the postnatal maternal plasma and the umbilical cord blood between the preeclampsia group and the matched control group. However, our knowledge about leptin is limited, and more studies are needed to explain the reason for the increase in leptin in such patients.

Keywords: Preeclampsia, leptin, obesity.

Preeklamptik gebelerde maternal plazma ve kordon kanı leptin konsantrasyonları

Amaç: Preeklamptik ve normal gebelerde, gebelikte ve gebelik sonrasında maternal plazma leptin değerleri ile her yenidoğan kordon kanı leptin değerlerini karşılaştırmaktır.

Yöntem: Gebelikte maternal plazma, doğumda kordon kanı, postpartum dönemde maternal plazma kanı leptin değerleri, örnekleme zamanındaki gestasyonel yaşa ve gebelik vücut indeksine göre denkleştirilmiş preeklampsi grubu (n=40) ile normal gebelik grubu ile (n=32) karşılaştırıldı. İstatistiklerde student t ve Mann Whitney U testleri kullanıldı.

Bulgular: Maternal plazma leptin konsantrasyonu gruplar arasında istatistiksel anlamlı bir farklılık göstermektedir. Preeklamptik grupta leptin konsantrasyonu anlamlı olarak yüksek bulunmuştur (p=0.048). Kordon kanı ve doğum sonrası leptin değerlerinde, gruplar arasında istatistiksel fark saptanmamıştır (p>0.05).

Sonuç: Preeklampside maternal plazma leptin konsantrasyonu artarken, kordon kanı ve doğum sonrası leptin değerleri farklı bulunmamıştır. Ölçümlerdeki dağılım farklılığı daha geniş serilerde çalışmayı gerekli kılmaktadır.

Anahtar Sözcükler: Preeklampsi, leptin, obezite.

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Introduction

Leptin is a proteohormone coded by the obesity gene and produced by adipocytes. Although leptin mRNA has been detected in the human placenta, it is mainly found in adipose tissue.[1] During the pregnancy period a considerable amount of leptin is secreted from the placental trophoblastic cells into the maternal circulation.[2] Leptin concentrations are 3 to 4 times higher in pregnant women than non pregnant women.[3] Leptin increases significantly in women with preeclampsia, and especially in those with severe preeclampsia. This increase correlates with placental mRNA expression, and following the delivery of the placenta, decreases immediately to expected values. An increase in leptin secretion has been shown in hypoxia in laboratory conditions. The increase in placental leptin production in preeclampsia is thought to happen in response to hypoxia.[4] Leptin levels have been shown to increase in preeclamptic women.[5-7] Increased levels of leptin is thought to be an indication of maternal steatosis and placental insufficiency. Leptin may also cause to endothelial dysfunction by increasing free fatty acid oxidation.[8]

Our aim in this study is to compare the prenatal and postnatal maternal plasma and umbilical cord blood leptin values of women with normal pregnancies and women with preeclampsia.

Methods

This study was designed as a randomized prospective case-control study. Forty women in their third trimester of singleton pregnancies internalized in our obstetrics and gynecology clinic with the diagnosis of preeclampsia between April 2004 and October 2004 and 32 normotensive women with singleton pregnancies determined to be healthy and free of chronic diseases (diabetes, heart disease, thyroid disease) by medical examination and tests were included in the study. The inclusion criteria for the preeclampsia group were a blood pressure of 140/90mmHg or more, measured on at least two times 6 hours apart; 500 mg or more protein in a 24 hour urine sample, or a 2(++) proteinuria dipstick finding in a random urine sample.[9] Preeclamptic patients with these criteria who had not received any medication were included in the study. No medication was given to these patients before blood was taken for leptin levels and other routine tests. Because of the possibility of smoking affecting plasma leptin levels, all patients were selected to be nonsmokers. Fasting venous blood samples were drawn from the antecubital veins from all pregnant women in the study and control groups at a state of rest between 08.00 and 10.00 a.m. Following vaginal or cesaerean delivery a second clamp was placed on the umbilical cord at the placental end and blood samples were taken from either the vein or arteries of the umbilical cord. Within the first 24 hours following delivery, blood samples were taken at 8.00-10. a.m. The weight and height of all pregnant women in both the study and the control group were recorded during the initial examination and their body mass indexes (BMI) were calculated with the [kg / m2] Formula.[10]

The groups were stratified according to the maternal age, gestational age and body mass index doing randomization. The cases of the groups were selected by the way of simple randomization. The maternal plasma, umbilical cord blood, and postpartum maternal plasma leptin concentrations of the preeclampsia group (n=40) with the patients selected to have similar body mass indexes and to be at the similar gestational weeks were compared with those of the normal pregnancy group (n=32). During the evaluation of the study data, besides descriptive statistical methods (mean, standard deviation), Student t test and Mann-Whitney U tests were used when comparing quantifiable data. The results were evaluated at the 95% confidence interval, and $p<0.05$ significance level.

Results

The gestational ages at the time of sampling were found to be 38.40±1.90 weeks in the preeclampsia group, and 39.00±1.75 weeks in the normal pregnancy group. No significant difference was found to exist in the gestational ages at the time of sampling and the time that passed from the date of sampling for maternal plasma leptin concentrations (MPLC) until delivery amongst the two groups (p>0.05). The mean of BMI in the preeclamptic pregnancy group was 28.11±3.88 kg/m2, and 26.76±3.38 kg/m2 in the normal pregnancy group. There were no significant differences in the mean of BMI's and serum creatinin levels between two groups (p>0.05). The maternal plasma leptin concentrations (MPLC) were significantly different between the two groups. The mean leptin concentration in the preeclamptic pregnancy group (196.8 ng/ml) was found to be significantly higher than that in the normal pregnancy group (60.3 ng/ml) (P<0.05) .

Although we found 2 or 2.5 times differences in the postnatal maternal plasma (77.5±109.2 ng/ml and 31.3±23.5 ng/ml, P>0.05) and umbilical cord blood (16.7±17.2 ng/ml and 8.2±5.2 ng/ml, P>0.05) leptin values between the groups, no significant difference in the umbilical cord blood leptin levels between the two groups has been found. The difference leptin value inthe prenatal and postnatal period were found significantly different between the groups (p<0.05) (Table:1).

Discussion

In the non-pregnant, leptin is mainly produced in adipose tissue.[1] Metabolic changes such as glucose intolerance and insulin resistance encountered in obesity can also be seen in preeclampsia. The increase in leptin levels in both obesity and preeclampsia is an important finding. During their study in 1998, Mise et. al detected for the first time a significant increase in serum leptin levels of preeclamptic, especially severely preeclamptic pregnant women.[4] They have shown an increase in placental leptin mRNA expression proportional to an increase in serum leptin levels in these patients, and a decrease in serum leptin levels following delivery of the placenta. This situation points to the fact that an increase serum leptin levels in preeclamptic women is related with placental production. The increase in placental leptin is an indication of placental hypoperfusion and/or hypoxia. Hypoxia increases placental leptin production by induction of a group of placental genes in the trophoblastic cells. Therefore, it can be concluded that increasing leptin levels is a general reaction of the cells to hypoxia.

In severe preeclampsia leptin is an indicator of placental hypoxia.[11] Similar to Mise et al,[4] Mc Carty et al,[5] Ouyang et al[12] and Sharma et al[13] have detected a significant increase in plasma leptin levels in preeclamptic cases. In our study, the mean leptin level of the preeclamptic group was 3.26 times the mean leptin level of the normal pregnancy group.

Table 1. Comparison of the leptin levels between the groups.

	Preeclampsia (n:40)		Control (n:32)		
	Mean ± SD	Median	Mean ± SD	Median	p
Maternal plasma leptin(ng/ml)	196.8±190.8	124	60.3±45.2	40.5	Z=-1.751; 0.048*
Cord plasma leptin (ng/ml)	16.7±17.2	12	8.2±5.2	8.5	Z=-1.146; 0.252
Postpartum plasma leptin	77.55±109.2	35	31.3±23.5	22.2	Z=-0.478; 0.633
Difference of leptin between before and after delivery (ng/ml)	119.2±126.7	83	29.0±40.6	16.1	Z=-2.308; 0.021*

**p<0.05 statistical importance*
Z Mann-Whitney U test

Even though quite a number of studies questioning the relation between the ethiopathogenesis of hypertension and increasing plasma leptin levels have been reported, an increase in blood pressure only is not enough to explain the increase in leptin levels.[14-17] In our study, in the early postpartum period, when the blood pressure is going at the high level, the fact that maternal plasma leptin levels of preeclamptic women are similar to those of normotensive cases, supports the idea presented above.

Renal dysfunction, one of the pathologic findings in pregnant women with preeclampsia; and therefore decreased renal clearances, may be responsible for the high leptin levels in preeclamptic pregnant women. In our study, creatine clearances were not calculated in the control and study group however no statistically significant difference in creatine levels was detected between the two groups. This leads to the conclusion that the difference in leptin levels between the two groups can not be explained by differences in renal function. Decreased plasma volumes sometimes seen in preeclampsia may have a role in the increase in serum leptin level by causing hemoconcentration.

Leptin levels in non-pregnant women correlate with the body mass index. However, in the pregnant state, the body mass index may not accurately show the amount of body fat because the fetus, placenta, amniotic fluid, increased plasma volume and accumulation of various amounts of extracellular fluid increase the maternal weight.[5] In the preeclamptic women extracellular fluid distribution is quite prominent. In our study, no statistically significant difference in the body mass indexes between the preeclamptic and normal pregnancy groups was detected. The relation between the BMI and plasma leptin levels seen in the first and second trimesters is not present in the third trimester.[18] In our study the patients have been been examined in the third trimester of their pregnancy only once and their BMI's have been calculated. For this reason, we have not been able to detect the changes in the body mass indexes. In a normal pregnancy, taking into account the lack of a correlation between the maternal and umbilical cord blood leptin levels, the fetoplacental leptin regulation can be said to be a non communicating, double compartment model.[5] However in preeclampsia, the strong correlation between the maternal and fetal leptin concentrations is indicative of a change, resulting in communication between the two compartments.[5]

Mc Carthy et al have found a strong correlation between the maternal plasma leptin concentrations and umbilical cord blood leptin concentrations in the pregnant women with preeclampsia.[5] However no statistical difference in the the postnatal maternal plasma and the umbilical cord blood leptin levels was detected between the groups in our study.We thought that the most important cause of no statistical difference of leptin levels in the postnatal maternal plasma and the umbilical cord blood between the groups was the wide distributions of the leptin value.

Conclusion

In conclusion, independent of the maternal body mass index, comparing the preeclampsia group with the matched control group; we have found the increases of leptin value in the maternal plasma concentrations in preeclampsia. We found remarkable but non statistical difference of leptin values in the postnatal maternal plasma and the umbilical cord blood between the groups We thought that the most important cause of no statistical difference of leptin levels in the postnatal maternal plasma and the umbilical cord blood between the groups, was the wide distributions of the leptin value.

Nevertheless, more studies are needed to find the main reason for the increase in leptin concentrations with preeclampsia

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