

# PERINATAL JOURNAL

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# PERINATAL JOURNAL

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- Viewpoint Article
- Review Article
- Abstracts
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- Erratum

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

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**Page 2** - Abstract and key words

**Page 3** and next - Main text

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**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 unusual 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 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.

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— **Letters to the Editor** should not have titled sections. If there is a citation about a formerly published article within the text, reference(s) should be provided.

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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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Journal titles should be abbreviated according to the Index Medicus. All authors if six or fewer should be listed; otherwise, the first six and "et al." should be written.

Direct use of references is strongly recommended and the authors may be asked to provide the first and last pages of certain references. Publication of the manuscript will be suspended until this request is fulfilled by the author(s).

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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.

## Figures and tables

All illustrations (photographs, graphics, and drawings) accompanying the manuscript should be referred to as "figure". All figures should be numbered consecutively and mentioned in the text. Figure legends should be added at the end of the text as a separate section. Each figure should be prepared as a separate digital file in "jpeg" format, with a minimum 300 dpi or better resolution. All illustrations should be original. Illustrations published elsewhere should be submitted with the written permission of the original copyright holder. For recognizable photographs of human subjects, written permission signed by the patient or his/her legal representative should be submitted; otherwise, patient names or eyes must be blocked out to prevent identification. Microscopic photographs should include information on staining and magnification.

Each table should be prepared on a separate page with table heading on top of the table. Table heading should be added to the main text file on a separate page when a table is submitted as a supplementary file.

## Submission

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## Submission Checklist

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

1. Manuscript length (max. 4000 words for research articles)
2. Number of authors (max. 6 authors for research articles)
3. Title page (no unusual abbreviations)
4. Abstracts (max. 250 words for research articles)
5. Key words (max. 5 keys for research articles)
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9. Cover letter
10. Acknowledgement of Authorship and Transfer of Copyright Agreement (undersigned by all authors)
11. Conflicts of Interest Disclosure Statement (if necessary)



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# The Effects of the Pre-Pregnancy Maternal Body Mass Index on the Pregnancy Outcomes

Özgür Dünder<sup>1</sup>, Tolga Çiftınar<sup>2</sup>, Levent Tütüncü<sup>1</sup>, Ali Rüstü Ergür<sup>1</sup>, Mehmet Vedat Atay<sup>1</sup>, Ercüment Müngen<sup>1</sup>

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## Abstract

**Objective:** The aim of our study is to investigate the effects of the pre-pregnancy maternal body mass index on the pregnancy and the neonatal outcomes.

**Methods:** The medical reports of 1038 pregnant women who attended and delivered in our clinic between January 2005 and October 2007 were analyzed retrospectively. The patients were grouped as low body weight, normal, over-weight and obese according to the American Food and Drug Association criteria by patients' verbal reports. The gestational and the perinatal outcomes of the pregnant women who have different body mass index were compared.

**Results:** The average of age, gravidity, and parity increase directly proportional with body mass index. When the body mass index increases the cesarean section is seen more as the birth way ( $p=0.02$ ), and the cephalo-pelvic disproportion is seen as the major indication for cesarean ( $p=0.025$ ). Laceration is seen more in obese patients at the birth ( $p<0.001$ ). There has been no difference between the groups concerning the complications like uterine atony, meconium and preterm birth, but in obese group the need for neonatal intensive care unit is seen more necessary ( $p=0.003$ ).

**Conclusion:** High pre-pregnancy maternal body mass index is associated with more operative birth and neonatal problems. To begin the pregnancy with an ideal body weight will make better results for both mother and baby.

**Keywords:** Body mass index, perinatal outcome, operative birth.

## *Gebelik öncesi maternal vücut kitle indeksinin perinatal sonuçlara etkisi*

**Amaç:** Terme ulaşan gebeliklerde gebelik öncesi maternal vücut kitle indeksinin gebelik ve neonatal etkilerini araştırmak.

**Yöntem:** Ocak 2005 ve Ekim 2007 tarihleri arasında kliniğimizde takip edilen ve doğum yapan 1038 hastanın kayıtları retrospektif olarak incelendi. Hastaların vücut kitle indeksi sözel bildirimleri esas alınarak Amerikan Beslenme ve Gıda Enstitüsü değerlerine göre zayıf, normal, aşırı kilolu ve obez hasta olarak gruplandırıldı. Farklı vücut kitle indeksine sahip gebelerin gebelik seyri ve perinatal sonuçları karşılaştırıldı.

**Bulgular:** Vücut kitle indeksi ile yaş, gravida ve parite ortalamaları doğru orantılı olarak artmaktadır. Vücut kitle indeksi arttıkça doğum şekli olarak sezaryen daha fazla görülürken ( $p=0.02$ ), artan sezaryen oranlarında en sık endikasyon baş-pelvis uyumsuzluğu olarak saptandı ( $p=0.025$ ). Vücut kitle indeksi arttıkça doğum esnasında laserasyon oranlarında artış saptandı ( $p=0.001$ ). Doğumlarında uterus atonisi amnios mayiinin mekonyumlu olması ve erken doğum gibi komplikasyonlar açısından gruplar arasında fark görülmezken obez grupta daha fazla yenidoğan yoğun bakım ünitesine ihtiyaç saptandı ( $p=0.003$ ).

**Sonuç:** Gebelik öncesi yüksek maternal vücut kitle indeksi daha çok operatif doğumla ve daha çok neonatal problemlerle ilişkilidir. Gebeliğe ideal vücut ağırlığıyla başlamak hem anne hem de bebek için daha iyi sonuçlar doğuracaktır.

**Anahtar Sözcükler:** Vücut kitle indeksi, perinatal sonuç, operatif doğum.



## Introduction

Obesity, which is defined as the disease of modern era, is a serious health issue frequently increasing in our society as well as in the world. Obesity is a multifactorial disorder which is related with malnutrition, limited physical activity, metabolism rate and genetic factors. Obesity has negative effects during pregnancy as well as increasing morbidity and mortality in terms of many diseases. It is known that obesity may cause infertility, polycystic ovary syndrome, irregular menses, gestational issues during pregnancy, obstetric complications and neonatal negative results.<sup>1</sup> Body mass index (BMI) calculated by dividing body weight by the height squared is used to evaluate the obesity. BMI values obtained during the period before pregnancy or on first trimester should be used for the evaluation of pre-conceptual obesity.<sup>2</sup> While it was reported that the maternal obesity and over-weight in pre-gestational period are related with obstetric complications such as gestational diabetes, hypertension, preeclampsia, macrosomia and high cesarean rate, it was found that the body weight under normal scales (weak) is related with fetal growth limitation.<sup>3,9</sup> The purpose of this study is to research the relation of pre-conceptual maternal BMI with obstetric complications and the effects on perinatal outcomes.

## Methods

Archive files of all women who completed their 182nd–293rd gestational days and delivered in our clinic between January 2005 and October 2007 were analyzed retrospectively in order to include into the study. Patients who came for their first examination after first trimester and did not remember their pre-pregnancy weights exactly, cases with multiple pregnancies, cases with maternal systemic disease, cases who had placenta previa, cases with

decollement placenta and cesarean cases who had ex-cesarean, rectal primipara or post-treatment gestation as primary indication were excluded from the study in case that delivery time and weight could be affected. Similarly, pregnant who did not have antenatal follow-up in our polyclinic and applied to our clinic for the first time at delivery were excluded from the study. Totally 1038 patients who measured up were included into our study. Body mass indexes were calculated by pre-gestational weight and height measurements reported by patients verbally on the first visit to hospital after they got pregnant. Body mass index was calculated by dividing body weight (kg) by the height (m) squared. Values accepted by American Food and Drug Association were used for classification of obesity. According to this classification, women with BMI equal or below 18.4 kg/m<sup>2</sup> were considered as underweight, while between 18.5 and 24.9 kg/m<sup>2</sup> were considered as normal, between 25 and 29.9 kg/m<sup>2</sup> as overweight and above 30 kg/m<sup>2</sup> as obese. Perinatal results of groups having different BMI values were compared. Statistical analysis of data was done by using Statistics Package for Social Sciences version 11.0 (SPSS Inc., Chicago, IL). ANOVA (Tukey HSD Multiple Comparison) was used to compare averages among groups and multiple chi-square test was used to compare rates. Pearson correlation test was operated to evaluate the relation between BMI and the averages of groups while logistic regression analysis was done for effects of confounding factors in multivariate analyses. Data was given as average and standard deviation ( $\pm$ SD). Type 1 error grade was accepted as 0.05.

## Results

Totally 1038 patients were included into the study. There were 104 patients (10%) in the underweight patient group (Group 1), 764 patients (73.6%) in the normal patient group

(Group 2), 140 patients (13.5%) in overweight patient group (Group 3) and 30 patients (2.9%) in obese patient group (Group 4).

BMI, age, gravida, pregnancy period, delivery weight and parity averages of groups were shown in Table 1. Average pregnancy period and average delivery weights among groups were similar; however, it was also observed that gravida and parity rates increased together with the BMI increase ( $p=0.02$ ;  $p=0.043$ , respectively). Mean age was statistically and significantly increasing as BMI was increasing among the groups ( $r=0.323$ ,  $p=0.0001$ , respectively) (Fig. 1).

When delivery types and cesarean rates of groups were compared (Table 2), it was seen that cesarean rates were increasing statistically and significantly as BMI was increasing ( $p=0.02$ ) and there was statistically significant difference in terms of cephalopelvic disproportion when cesarean indications among groups were examined ( $p=0.025$ ). Increased cesarean rate due to cephalopelvic disproportion was also found as significant in logistic regression analysis which was performed by using confounding factors (age, gravida, parity, pregnancy period, delivery weight) ( $\beta=0.621$ ; OR:1.53 95%CI 0.22-9.08,  $p=0.04$ ). Statistically no significant difference was found among groups when

they were compared for early labor rates ( $p=0.431$  and  $p=0.473$ , respectively).

Statistically no significant difference was found among groups when atony follow-up rates were compared ( $p=0.438$ ) and amnios fluid rates stained with meconium ( $p=0.289$ ). Laceration rates were statistically and significantly increasing as BMI increased ( $p<0.001$ ) when postnatal laceration rates were compared.

When the rates of application to newborn intense care unit in groups were compared, it was seen that there was statistically a significant difference as it was higher in Group 4 ( $p=0.003$ ). Similarly, this difference kept its significance in logistic regression analysis ( $\beta=1.316$ , OR: 1.84 95%CI 0.13-4.67,  $p=0.005$ ).

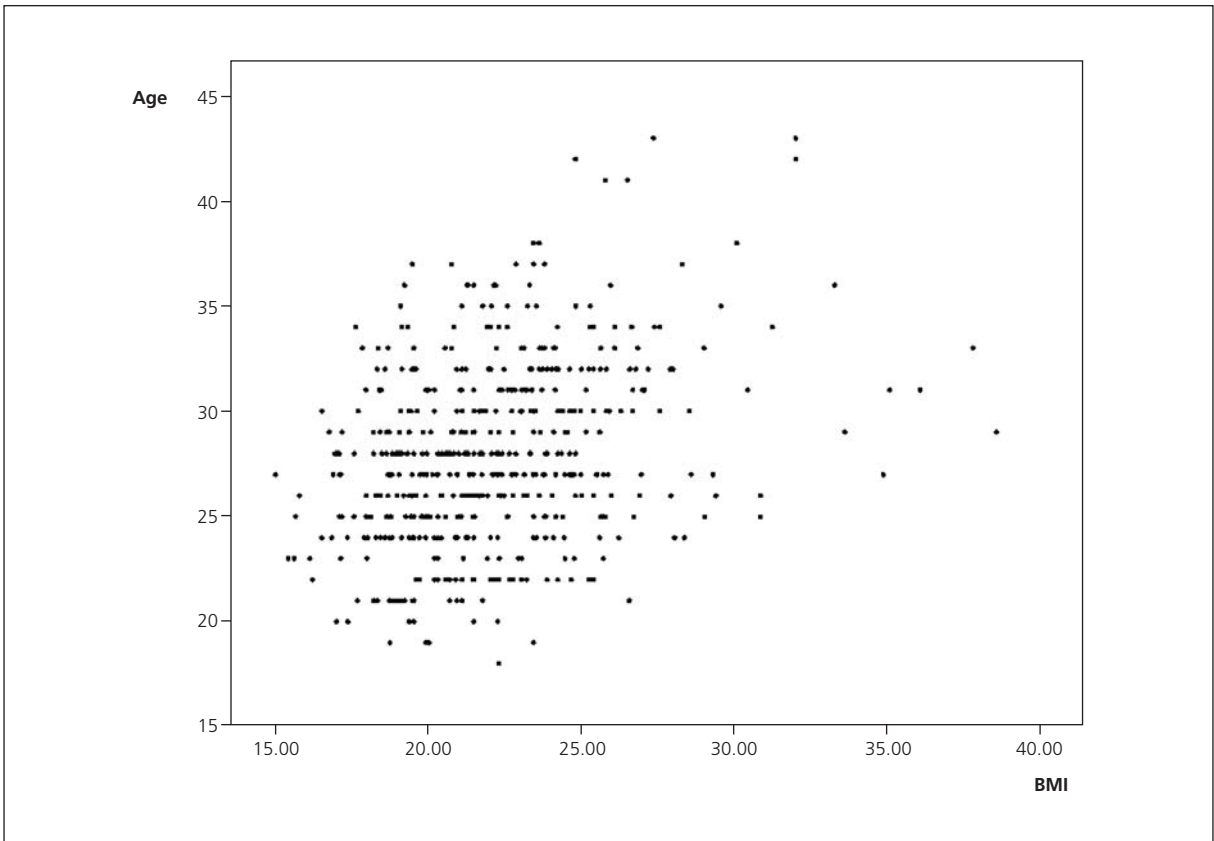
## Discussion

Results of this study show that pre-gestational BMI values increase cesarean rates due to cephalopelvic disproportion, postnatal laceration rates and the rates of being taken to newborn unit of baby.

Obesity is an important public health issue today. Fetal and maternal complications are seen more frequently with the addition of gestational period in which metabolic functions completely change. Chronic medical problems

**Table 1.** Demographic data of groups according to BMI values.

	Group 1 n=104 mean $\pm$ SD	Group 2 n=764 mean $\pm$ SD	Group 3 n=140 mean $\pm$ SD	Group 4 n=30 mean $\pm$ SD	p
<b>BMI</b>	17.43 $\pm$ 0.89	21.57 $\pm$ 1.77	26.49 $\pm$ 1.22	33.34 $\pm$ 2.62	
<b>Age</b>	26.2 $\pm$ 3.4	27.6 $\pm$ 4	29.7 $\pm$ 4.6	32.3 $\pm$ 5.4	0.0001
<b>Pregnancy period</b>	273.7 $\pm$ 11.6	274.3 $\pm$ 12.9	273.1 $\pm$ 16.2	267.5 $\pm$ 25	0.059
<b>Gravida</b>	1.3 $\pm$ 0.6	1.5 $\pm$ 0.7	1.8 $\pm$ 0.9	2.1 $\pm$ 1	0.02
<b>Parity</b>	0.3 $\pm$ 0.6	0.5 $\pm$ 0.7	0.8 $\pm$ 0.8	1.1 $\pm$ 1	0.043
<b>Delivery weight</b>	3235.77 $\pm$ 382.5	3362.8 $\pm$ 537.95	3349.93 $\pm$ 622.69	3177.33 $\pm$ 928.73	0.055



**Figure 1.** Positive correlation between BMI and age.

which already exist due to obesity in pre-gestational period cause more antenatal, peripartum and neonatal negative conditions with the pregnancy for both mother and baby compared to women who have normal pre-gestational body mass.

Although classification according to pre-gestational Body Mass Index is important in terms

of perinatal outcomes, weight increase in gestational period can be significantly effective.<sup>3,7</sup> On the other hand, it was shown in the retrospective study performed by Edwards et al.[8] on 1273 cases (683 obese and 690 normal BMI) that there is no relation between the differences of weight gaining during pregnancy and gestational complications.

**Table 2.** Delivery types and cesarean indications among groups..

	Delivery Type			Cesarean Indication			
	Normal spontaneous delivery	Induction	Early labor	Cesarean	Cephalopelvic disproportion	Acute fetal distress	Failure on induction
Group 1	52	20	8	24	7	9	8
Group 2	346	190	24	204	95	61	48
Group 3	56	28	8	48	21	17	10
Group 4	10	6	0	14	8	2	4

It was shown in the study performed on 245,000 cases in 2006 by Cedergren et al.<sup>9</sup> that obese pregnant women who gain less weight during gestational period have lower risk of laboring big baby and overweight and obese pregnant women who gain more weight during gestational period have higher risk of laboring big baby. It was shown that differences of gaining weight during gestational period affected obstetric outcomes more than pre-gestational body mass index.

The constraint of our study is that it does not reflect the weight gaining differences during gestational period. However, the risk of laboring big baby was found as high in overweight and obese pregnant women compared to pregnant women who had normal body mass index during pre-gestational period, and this difference is statistically significant.

It is also seen in the study of Cedergren et al.<sup>9</sup> that there is an increase in cesarean delivery rate in obese and morbid obese pregnant women who have high weight gaining and the risk of operative labor increases in overweight pregnant women. In the study of Doherty et al.<sup>10</sup> the rates of cesarean delivery frequency, gestational diabetes and delivery induction were higher in overweight and obese pregnant women compared to those with pre-gestational normal body mass index. Although obese women have the risk of delivering baby with intrauterine growth retardation (IUGR) (especially in hypertensive-preeclamptic cases), there is rather a common consensus that they deliver big baby. Irvine et al.<sup>11</sup> reported that fetal macrosomia incidence is higher in obese women and this causes obstetric complication development.

In the study of Vahratian et al.<sup>12</sup> it was seen that unplanned cesarean rate was higher in obese and overweight pregnant women compared to pregnant women with normal body mass index. They showed that approximately 1.2 fold of cesarean delivery in overweight pregnant women and approximately 1.5 fold of cesarean delivery in obese

pregnant women are required. They also stated that these cesarean indications were caused by acute fetal distress and dystocia. It was seen that more dystocia developed by the elongation of the first phase of delivery and this was based on the non-development of the case despite the 2 fold of period compared to normal delivery.

In our study, it is seen that cesarean rate increases as pre-gestational body mass index increases. This is related with the increases of body mass index and macrosomic baby development and the increase of the occurrence of cephalopelvic disproportion. At the end of our study, an increase was seen in macrosomia and cephalopelvic disproportion as body mass index increased and this increase was found statistically significant. Acute fetal distress and induction failure were found as other cesarean reasons but they were not found statistically significant. At the same time, the risk of laceration occurrence at delivery is high in babies of obese patients and this is related with macrosomia.

According to the study of Doherty et al.,<sup>10</sup> the rate of delivering baby with IUGR is higher in patients who are evaluated as underweight as to body mass index. Also the study of Cedergren et al.<sup>9</sup> showed that the rate of delivering baby with IUGR is higher in cases with low weight gaining during gestational period who were obese in pre-gestational period. In the study of Maddah,<sup>13</sup> less rate of babies with low birth weights were seen in pregnant women with low pre-gestational BMI and low weight gaining during gestational period compared to pregnant women with normal BMI in both groups. In our study, this rate was higher in underweight patient group but it was not found statistically significant.

According to the study of Doherty et al.,<sup>10</sup> neonatal adverse effects such as delivery induction rate, perineal traumas and neonatal hypoglycemia, neonatal resuscitation and low Apgar score which require special care increase as BMI increases in normal pregnancies which do not include complications induced by pregnan-

cy such as hypertension. In our study, no increase was observed in the risk of early labor in pregnant as BMI increases. However, rates of being taken to newborn unit of babies increase as pre-gestational body mass index increases.

## Conclusion

At the end of our study, we determined that cesarean rates increased due to cephalopelvic disproportion, postnatal laceration rates increased and the rates of being taken to newborn unit of baby increased as pre-gestational BMI values increased. Maternal adverse effects related with weight changes and neonatal outcomes are related with pre-gestational body mass index as well as weight amount gained during gestational period. Body mass index increases with age, gravida and parity of pregnant. Beginning to become pregnant with an ideal BMI would minimize traumas to be exposed by mother and baby and help us to reach a healthy mother and a healthy baby which is the primary obstetric purpose.

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# The Role of Maternal Serum Adiponectin Levels in Screening and Diagnosis of Gestational Diabetes Mellitus

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## Abstract

**Objective:** To evaluate the role of maternal serum adiponectin levels in screening and diagnosis of gestational diabetes mellitus (GDM).

**Methods:** Two hundred and seventy four pregnant patients which were followed-up in our clinic were enrolled in our study. Between the 24th and 28th gestational weeks we performed single step (75 g) OGTT to 125 pregnant patients and two steps (50/100 g) OGTT to 149 pregnant patients. Serum adiponectin levels were measured in all pregnant women. The results of the GDM group and the control group were compared.

**Results:** In the two steps OGTT we detected 31 (20,8%) GDM cases out of 149 patients. In the single step OGTT we detected 27 (21,6%) GDM cases out of 125 patients ( $p > 0.05$ ). GDM was detected in 58 of 274 pregnant women (21,1%). We have detected a statistical significance between the maternal serum adiponectin levels of patients with GDM and healthy patients between 24-28 gestational weeks. The mean maternal adiponectin level was detected as  $12.1 \pm 5.6$   $\mu\text{g/ml}$  in patients with GDM whereas in healthy patients mean maternal adiponectin level was  $17,1 \pm 6.6$   $\mu\text{g/ml}$  [0.70, Confidence interval (CI) %95, 0,62-0,78  $p:0,0001$ ].

**Conclusion:** Adiponectin levels are significantly lower in patients with GDM when compared with healthy pregnant women.

**Keywords:** Gestational diabetes mellitus, adiponectin, oral glucose tolerance test.

## *Gestasyonel diabetes mellitus tanı ve taramasında maternal serum adiponektinin yeri*

**Amaç:** Gestasyonel diabetes mellitus (GDM) tanı ve taramasında maternal serum adiponektin seviyesinin öneminin irdelenmesi.

**Yöntem:** Çalışmamıza kliniğimizde takipleri yapılan 274 gebe dahil edildi. 24-28 gebelik haftasında 125 gebeye tek aşamalı 75 gr OGTT ve 149 gebeye de iki aşamalı gebelik diyabeti tarama testi uygulandı. Tüm gebelerde aynı zamanda serum adiponektin düzeylerine bakıldı. Uygulanan testler sonucu GDM tanısı koyulan gebelerle kontrol grubunun verileri karşılaştırıldı.

**Bulgular:** 149 hastadan oluşan iki aşamalı test grubunun 31'inde (%20,8) GDM tespit edilirken, 125 gebeden oluşan tek aşamalı test grubunun 27'sinde (%21,6) GDM tespit edildi ( $p > 0.05$ ). Toplam 274 hastanın 58'inde (%21,1) GDM olduğu görüldü. Yapılan testler sonucunda GDM tespit edilen ve edilmeyen gebeler arasında 24-28. GH arasında bakılan serum adiponektin düzeylerinde istatistiksel olarak ileri derecede anlamlı fark saptandı. GDM'li gebelerin ortalama adiponektin düzeyi  $12.1 \pm 5.6$   $\mu\text{g/ml}$  iken, GDM olmayanların ortalama adiponektin düzeyi  $17,1 \pm 6.6$   $\mu\text{g/ml}$  olarak bulundu [0.70, Confidence interval (CI) %95, 0,62-0,78  $p:0,0001$ ].

**Sonuç:** GDM'li gebelerde serum adiponektin düzeyleri anlamlı olarak sağlıklı gebelerden düşük bulunmuştur.

**Anahtar Sözcükler:** Gestasyonel diabetes mellitus, adiponektin, oral glukoz tolerans testi.

## Introduction

Gestational diabetes mellitus (GDM) is defined as a carbohydrate intolerance which either begins or is diagnosed during pregnancy.<sup>1</sup> Another definition is hyperglycemia seen after the 20th gestational week. GDM is seen approximately in 3-5% of all pregnancies, although this ratio may change between 1-14% depending on the population or the test used.<sup>2,3,4</sup>

It's still controversial how to screen and diagnose GDM. Formerly it has been suggested to screen all pregnant patients, then screening high risk patients only or performing the diagnostic test directly in high risk patients have been found to be more appropriate. But it's reported that only 50% of GDM cases can be diagnosed by screening high risk patients.<sup>5</sup>

Today, we use 50 g oral glucose tolerance test (OGTT) for screening and 100 g OGTT for diagnosis of GDM.<sup>2,3,6</sup> Recently, considering the cost effectiveness, 75 g OGTT was proposed as a screening and diagnostic test performed in a single step. World Health Organisation (WHO) recommends 2 hours 75 g OGTT and this test is accepted in some European countries. Two-steps test is used in United States.<sup>2,3</sup> See table 1 for the diagnostic criteria used in GDM.

Adiponectin is secreted from the adipose tissue and is the most abundant adipokine in circulation and it plays a key role in metabolic syndrome.<sup>9</sup> The plasma level is 2-30  $\mu\text{g/ml}$ . Adiponectin has anti-inflammatory, anti-atherosclerotic and anti-diabetogenic effects. Insulin is the main regulator of its secretion from the adipocytes. The most well-known effect of adiponectin is regulation of the insulin sensitivity. Adiponectin has globular and collagen components. After the secretion it's trans-

formed to trimer form, and finally it becomes a polymer which is composed of 4-6 trimers. Both trimer and polymer forms are found in the circulation, whereas monomer form is not. The globular part of adiponectin is similar to TNF- $\alpha$ , except the sequence. Both globular and complete forms of adiponectin is accepted to be biologically active but controversies still continue. Leukocyte elastase separates the globular structure from the molecule. This part may be retrimmerized but it cannot polymerize back. Therefore, the active leukocytes are thought to regulate the bioactivity of adiponectin by an unknown mechanism. Although the adipocytes are the main source of adiponectin, there is no increase in adiponectin as well as leptin levels in obese patients. In contrast, adiponectin levels are found to be decreased in obese patients and increased in patients with anorexia nervosa. Adiponectin levels are significantly decreased in patients with diabetes mellitus type 2. The relationship between insulin sensitivity status and adiponectin levels is not clear. However in obese patients, TNF- $\alpha$  secreted from white adipose tissue (WAT) is found to suppress production and secretion of adiponectin.<sup>10</sup>

On the other hand, adiponectin decreases the production and activity of TNF- $\alpha$ . The TNF- $\alpha$  originating from macrophages have been suppressed by adiponectin in rats induced by endotoxin. Reduction of IL-6, induction of IL-10 and antagonization of IL-1 receptors are other anti-inflammatory effects of adiponectin. These effects of adiponectin can be explained by NF- $\kappa\text{B}$  inhibition. It binds to collagen I, III and V but spares II and IV. It interferes with the opposition of endothelial adhesion molecules and VCAM-1, ICAM-1 and E-selectin. Adiponectin significantly reduces the activities

**Table 1.** The diagnostic criteria used in GDM.<sup>7,8</sup>

Organization	(OGTT)	Modified criteria	Plasma glucose levels (mg/dl)			
			Fasting	1. hour	2. hour	3. hour
ADA	100 g	Carpenter and Coustan	≥95	≥180	≥155	≥140
	75 g		≥95	≥180	≥155	-
ACOG	100 g	NDDG or Carpenter and Coustan	≥105	≥190	≥165	≥145
WHO	75 g		≥126	-	≥140	-

Two or more values above threshold are required for ACOG or ADA criteria. One or more value(s) above threshold is/are required for WHO criteria.<sup>5,10</sup>

**DM:** Diabetes Mellitus; **GDM:** Gestational Diabetes Mellitus; **ADA:** American Diabetes Association; **ACOG:** American College of Obstetricians and Gynecologists; **WHO:** World Health Organization; **OGTT:** Oral Glucose Tolerance Test; **NDDG:** National Diabetes Data Group

of ICAM-1 and VCAM-1. Besides adiponectin regulates activities of resistin and visfatin which are secreted from the WAT and effects on insulin.<sup>11</sup>

The collagen part of the adiponectin is similar to the complement factor C1q, surfactant protein A, surfactant protein D and mannose binding protein. It can bind endotoxin with high affinity which is a lipopolysaccharide (LPS). Therefore the role of adiponectin in endotoxemia is attributed to its interaction with LPS rather than its anti-inflammatory effect.

## Methods

Two hundred and seventy four pregnant patients admitted to Cerrahpasa Medical Faculty Department of Obstetrics and Gynecology pregnancy outpatient clinic and perinatology clinic, March 2005 and February 2006 inclusive were enrolled. Our study is designed as a descriptive study.

The gestational ages were calculated according to the last menstrual period (LMP) and early pregnancy ultrasound measurements. Age, height, weight, body mass index

(BMI), personal history, family history, gravidity, parity and OGTT test results were recorded.

10 cc of venous blood samples from all patients in the study group were collected in dry tubes before performing the diabetes screening tests between 24-28 GWs. Serum parts were separated and preserved in -80°C till target patient population is reached to be evaluated at once. Serum adiponectin levels were measured.

GDM screening and diagnosis tests were performed between 24-28 GWs in all 274 patients. Single step 2 hours 75 g OGTT was performed in 125 patients. The test results were interpreted according to the ADA criteria (?2 values above threshold, fasting glucose levels: 95 mg/dl, 1 hour: 180 mg/dl, 2 hours 155 mg/dl). Two steps 50 g OGTT was performed in 149 patients. The patients with 1 hour blood glucose levels of ?140 mg/dl were accepted as screening test positive according to ADA and ACOG criteria. The diagnostic test was performed in screening test positive patients after a 3 days standard diet (at least 250 g of daily carbohydrate). After a fasting period of 12-16 hours, the blood samples were collected at 8 am and then in the 1st, 2nd and 3rd hours.



Carpenter and Coustan criteria were considered in the interpretation of 100 g OGTT and  $\geq 2$  levels above threshold (fasting: 95 mg/dl, 1 hour 180 mg/dl, 2 hour 155 mg/dl, 3 hour 155 mg/dl) were accepted to have GDM.

Serum adiponectin levels were measured by a kit which is based on ELISA (Human adiponectin assaypro catalog no: EA2500-1). Adiponectin levels were recorded in microgram/ml ( $\mu\text{g/ml}$ ).

Statistical Package for Social Sciences (SPSS Release 11.5, SPSS inc., Chicago, IL, USA) was used during statistical calculations. Student's t test was used for parametric variables. 0.05 was accepted as threshold for statistical significance. Sensitivity, specificity and area under curve values were calculated ROC (Receiver operating characteristic) curves.

## Results

Two hundred and seventy four patients were included into the study. GDM was observed in 58 (21.1%) patients and not observed in 216 patients. Two steps and single step tests were performed in 149 and 125 women, respectively. These two groups were similar in respect to age, gravidity, parity, maternal weight and BMI, gestational week at screening.

Among 149 patients who underwent two steps OGTT, GDM was found in 31 (20.8%) patients. Among 125 patients who underwent single step OGTT, GDM was found in 27 (21.6%) patients. GDM was detected in 58 (21.1%) of 274 patients.

The serum adiponectin levels of patients with GDM and without GDM were significantly different. Mean serum adiponectin levels were  $12.1 \pm 5.6 \mu\text{g/ml}$  and  $17.1 \pm 6.6 \mu\text{g/ml}$  in patients with GDM and without GDM, respectively. ( $p:0.0001$ ) (Table 2, Graphic 1).

Area under curve (AUC) was calculated from the ROC curve drawn which was based on the adiponectin levels of the OGTT results of 274 women and found to be 0.706. [0.70, Confidence interval (CI) 95%, 0.62-0.78  $p:0.0001$ ] The threshold for adiponectin was set as  $10.4 \mu\text{g/ml}$ . Sensitivity, specificity and PPV are found to be 86%, 50% and 63.2% respectively.

If cut-off value of adiponectin is taken as  $5,6 \mu\text{g/ml}$ , sensitivity is 100% and specificity is 14% in general means. If cut-off value is taken as  $27 \mu\text{g/ml}$ , sensitivity is 11% and specificity is 100% (Table 3).

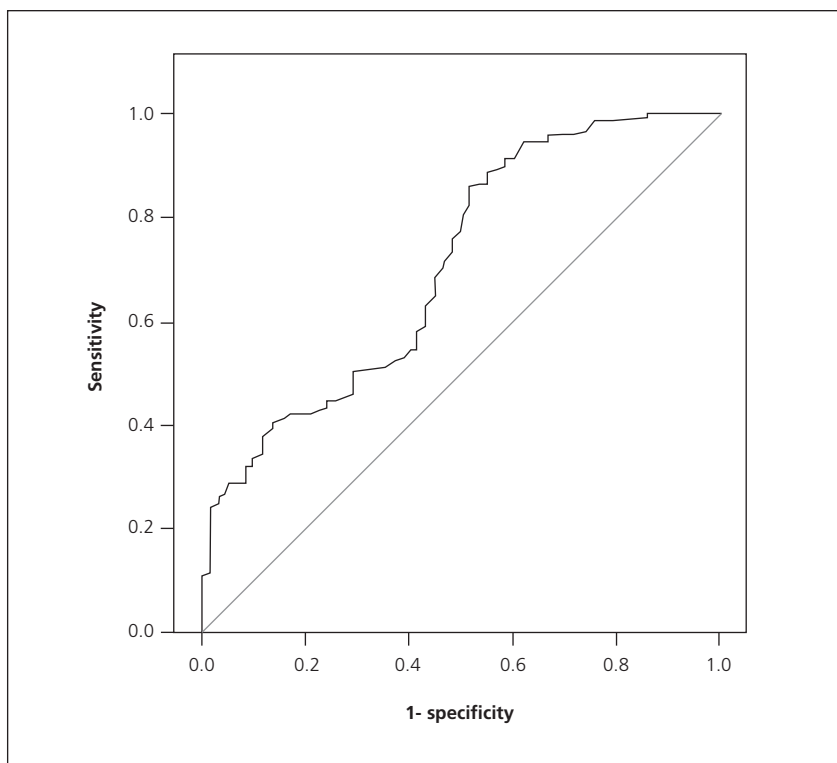
There were 38 women which were 50 gr OGTT positive and 100 gr OGTT negative. The mean adiponectin level of this group were compared with non-GDM group and there was no significant difference between two groups ( $p>0.05$ ).

**Table 2.** Serum adiponectin levels of normal pregnant women and women with GDM.

	Normal	GDM	p
Number of patients (n)	216	58	
Adiponectin (microg/ml)	$16.6 \pm 6.6$	$12.4 \pm 5.7$	<b>0.0001</b>
HbA1c	$4.86 \pm 0.54$	$5.39 \pm 0.52$	<b>0.0001</b>

$p < 0,05$  significant

**GDM:** gestational diabetes mellitus.



**Graphic 1.** ROC curve for adiponectin levels in women with GDM.

## Discussion

It's controversial not only whether screening for GDM in all patients or only in the risk groups, and also the screening method of choice. Screening for GDM in most population groups may seem unnecessary regarding that its prevalence is below 5%, but if the 4 folds increase in perinatal mortality is considered it's

a reasonable effort.<sup>12</sup> Although the average prevalence of GDM is 3-5%, it may vary between 1-14% depending on the method used.<sup>13,14</sup>

GDM incidence in Turkey is reported as 1.23-6,6%. In our study, GDM incidence was found as 21.1% and this high ratio is attributed to the fact that our clinic is a tertiary (reference) center.

**Table 3.** Sensitivity and specificity rates in various adiponectin levels in women with GDM.

Adiponectin level	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)
5.6 µg/ml	100	14	54	100
10.4 µg/ml	86	50	63	92
15 µg/ml	54	59	25	82
20 µg/ml	28	48	12	71
27 µg/ml	11	100	100	80

**GDM:** Gestational diabetes mellitus, **PPV:** positive predictive value, **NPV:** negative predictive value.

In our study there was no statistical significance between 75 g and 50/100 g OGTTs in detecting GDM (21.6% vs %20,8).

The most significant fetal complication in GDM was macrosomia. Sere day et al.<sup>15</sup> have chosen macrosomia as reference complication and compared sensitivity and specificity levels of 50 g, 75 g and 100 g OGTTs, and they found that the highest sensitivity was observed in 50 g whereas the highest specificity was observed in 75 g OGTT followed by 100 g OGTT. It has also been suggested that considering that some patients may miss the second step, 75 g OGTT is more reliable than 50/100 g OGTT.<sup>15</sup>

Adiponectin (Acrp 30, AdipoQ, apM-1 or GBP28) is a protein hormone which plays a role in a series of metabolic reactions including glucose regulation and fatty acid catabolism. Adiponectin is secreted into the blood mainly from adipose tissue. The blood levels of adiponectin are inversely proportional with the amount of fat in the body.

Maternal serum adiponectin levels are not correlated with maternal weight and BMI. Total liquid amount is increased during pregnancy and that's why body weight and BMI are weak parameters to assess adiposity in early postpartum period. Maternal serum adiponectin concentrations do not correlate with serum glucose and insulin levels. However, the negative correlation between the maternal serum adiponectin levels and maternal fasting glucose/insulin ratio may indicate that adiponectin has a role in glucose regulation. It's possible that adiponectin levels increase if effective glucose management is maintained and this may make adiponectin a good marker of insulin sensitivity.

It's not clearly stated so far that changes in maternal adiponectin levels in GDM are the cause or the result of GDM. In our study mean

maternal adiponectin levels of patients with GDM are found as 12.4 µg/ml compared to 16.6 µg/ml in women without GDM. (p: 0.0001)

If the treshold for adiponectin was set as 10.4 µg/ml, sensitivity, specificity and PPV were found to be 86%, 50% and 63.2% respectively.

If cut-off value of adiponectin is taken as 5.6 µg/ml, sensitivity is 100% and specificity is 14% in general means. If cut-off value is taken as 27 µg/ml, sensitivity is 11% and specificity is 100%. Therefore depending on the results we gathered from our study, we may conclude that GDM can be diagnosed in all patients with an adiponectin value of ≤5.6 µg/ml and GDM can be ruled out in all patients with an adiponectin value of ≥27 µg/ml. In our study, there are 8 patients whose adiponectin level is ≤5.6 µg/ml and 25 patients whose adiponectin level is ≥27 µg/ml.

We may also make a qualitative, instead of quantitative, measurement, in other words test results may be given as positive or negative instead of numeric values. In this case, if cut-off value is taken as 10.4 µg/ml as we did in our study, considering that the sensitivity is 86%, 49 (18.2% of all) patients would have been diagnosed as GDM and would be spared from OGTT and 9 (4.2% of all) would be missed even if they have been GDM.

Finally, we must emphasize that adiponectin is too expensive and obviously cannot be used instead of OGTT.

## Conclusion

Serum adiponectin levels are significantly lower in patients with GDM when compared with healthy pregnant women, supporting hitherto publications. We think that serum adiponectin levels can be used as a marker in screening and diagnosis of GDM.

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# Infant Deaths and Stillbirths in Samsun Province in 2007

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## Abstract

**Objective:** The aim of this study is to assess the perinatal and infant mortality statistics data, and to determine their basic descriptive characteristics in Samsun, between 1 January and 31 December 2007.

**Methods:** We analyzed the data included in the Infant Death Certificates which were sent to Provincial Directorate of Health in 2007. According the World Health Organization recommendations, babies weighing under 500g or born before 22 completed weeks of gestation are not included in the study.

**Results:** The total number of births was 18892. Of total births, 91 stillbirths and 167 infant deaths were declared. Of infants deaths 95 occurred in early neonatal, 38 in late neonatal and 34 were in post neonatal period. The perinatal mortality rate was 9.84 per 1000 and stillbirth mortality rate was 4.82 per 1000. Also, the data show that Neonatal Mortality Rate was 7.07 per 1000, of which early neonatal mortality rate was 5.05 and late neonatal mortality rate was 2.02. The infant mortality rate for the recent period was 8.88 per 1000. Infant's weight at birth is also closely associated with their chances of survival. Sixty-seven percent of neonatal deaths and 69.2% of stillborns were premature born babies.

**Conclusion:** In this study neonatal and perinatal mortality rates in our province were found lower than the studies in the region have been done before and the average found in Turkey. Decreasing in these rates of our province reflects the development of basic health services organization in the years. Nevertheless reduction of our perinatal and neonatal mortality rates to the levels in developed countries, it is essential to investigate causes of deaths with advanced studies and to following up the antenatal period.

**Keywords:** Perinatal mortality, infant mortality, stillbirth, prematurity.

## *Samsun İli 2007 yılı bebek ölüm ve ölü doğum istatistikleri*

**Amaç:** Ülkemiz genelinde perinatal ölüm ve yenidoğan ölümleri konusundaki çalışmalar kısıtlıdır. Amacımız, 2007 yılı Samsun İli perinatal, neonatal ve bebek mortalite hızı ve ölüm nedenlerini değerlendirmektir.

**Yöntem:** Çalışmamızda, Samsun İl Sağlık Müdürlüğü Ana-Çocuk Sağlığı ve Aile Planlaması Şube Müdürlüğüne 2007 yılına ait gönderilen "Bebek Ölümleri Bilgi Formu" bilgileri değerlendirildi. Ana- babaları Samsun ilinde ikamet eden, doğum ağırlıkları 500 gr veya gebelik yaşları 22 haftanın üzerinde doğan 258 adet bebeğe ait bebek ölümleri bilgi formu değerlendirmeye alındı. Bebek mortalite hızlarının hesaplanmasında Dünya Sağlık Örgütü'nün kriterleri kullanıldı.

**Bulgular:** Samsun İli toplam nüfusu 2007 yılı için 1177185 ve toplam doğum sayısı 18892'dir. Toplam 91 ölü doğumun ve 167 bebeğin bir yaşına gelmeden kaybedildiği belirlendi. Bebek ölümlerinin 95'i erken neonatal, 38'i geç neonatal, 34'ü postneonatal

dönemde meydana geldi. Samsun'da 2007 yılı perinatal ölüm hızı binde 9.84, ölü doğum hızı binde 4.82, erken neonatal ölüm hızı binde 5.05, geç neonatal ölüm hızı binde 2.02 olarak hesaplandı. Neonatal ölüm hızı binde 7.07, postneonatal ölüm hızı binde 1.81 olup, bebek ölüm hızı binde 8.88 olarak bulundu. Gebelik yaşı dikkate alındığında, erken neonatal ölümlerin %69.5'inin, geç neonatal ölümlerin %60.5'inin prematür bebekler olarak doğdukları görüldü.

**Sonuç:** Çalışmamızda ilimizde neonatal ve perinatal mortalite oranları Türkiye ortalamasından ve bölgede daha önce yapılmış çalışmalardan daha düşük oranlarda bulundu. İlimizde bu oranlardaki azalma yıllar içinde temel sağlık hizmetlerinin organizsyonundaki gelişmeleri yansıtmaktadır. Perinatal ve neonatal mortalite oranımızı yine de gelişmiş ülkelerdeki seviyelere indirilmesi için ölüm nedenlerinin ileri çalışmalarda araştırılması, antenatal takibin yapılması ve yaygınlaştırılması esastır.

**Anahtar Sözcükler:** Perinatal mortalite, neonatal mortalite, ölü doğum, prematür doğum.

## Introduction

The health index of a community is the basic element that designates the development and improvement of that country. Child and especially infant health are initially affected from the negations that may cause break down the health. Therefore the statistics data and objective index of perinatal, natal and postnatal periods are one of the main standards in planning health care and to asses the level of the health of community.<sup>1</sup> Thus neonatal and infant health are the important subjects as in all over the world. The studies about the perinatal and infant deaths are insufficient all over our country.<sup>2,3</sup> According to the data of Turkey Demographic and Health Survey (TDHS) neonatal mortality rate was 17 per 1000, post neonatal mortality rate was 12 per 1000 and infant mortality rate was found 29 per 1000 in 2003. In last few years the perinatal mortality rate in university hospital and major obstetrics and gynecology hospitals were reported. In respect of these data The Black Sea Region has the highest perinatal mortality rate.<sup>3</sup>

The aim of this study is to assess the rate of perinatal and infant mortality statistics data, and to determine their basic descriptive characteristics in Samsun, Black Sea Region, between 1 January and 31 December 2007.

## Methods

In this study, we analyzed the data included in the Infant Death Certificates which were sent to Provincial Directorate of Health in 2007. These forms were filled in at health centers where infant deaths and stillbirths occurred. We analyzed 258 infant death certificates that belong to infants whose parents stay in Samsun. According the World Health Organization (WHO) recommendations, babies weighing under 500g or born before 22 completed weeks of gestation are not included in the study.<sup>1</sup>

The information in the infant death certificates about date of birth/stillbirth and death, cause of death, place of death, place of birth, type of birth, birth weight, gestational age, existence of congenital malformation, address and identification of parents, number of stillbirths, births and abortions, age of mother, relationship and number of total follow up, etc. are analyzed in our study. Infants that birth weights under 2500 g are regarded as low birth weight. Perinatal Mortality Rate, Stillbirth Rate, Early and Late Neonatal Mortality Rate, Neonatal Mortality Rate, and Infant Mortality Rate for 2007 are calculated by using the following formulas:<sup>2,4</sup>

Perinatal Mortality Rate = Stillbirths + Early neonatal deaths (0-6 days) x 1000 / Total births (Stillbirths + live births) ; Stillbirth rate = Stillbirths x 1000 / Total births (Stillbirths + live births) ; Early Neonatal Mortality Rate = Early neonatal deaths (0-6 days) x 1000 / Live births; Late Neonatal Mortality Rate = Late neonatal deaths (7-27 days) x 1000 / Live births; Neonatal Mortality Rate = Neonatal deaths (0-27 days) x 1000 / Live births ; Infant Mortality Rate = Infants deaths (0 - 364 days) x 1000 / Live births.

Number of total births of Samsun in 2007 for calculating the mortality rates are acquired from Provincial Directorate of Health. In our study "SPSS for Windows13.0" was used for statistical analysis.

## Results

Samsun's population in 2007 was 1177185 and 18892 babies were born dead or alive with a birth weight of more than 500 grams and a gestational age over 22 weeks. In the study period 8745 births occurred in the towns and 10147 births occurred in the center (7676 of them in the Samsun Maternity and Children s Hospital) of the city. 143 of these births occurred at home without any medical support and 222 of them with the medical support of midwives at home or in the mother - children health centers.

Of total births, 91 stillbirths and 167 infant deaths were declared with Infant Death Certificates. Of infants deaths 95 in early neonatal, 38 in late neonatal and 34 were seen to occur in the post neonatal period. Most of the deaths occurred in infant period before completing the first month of life (n=133/167), and 71.4 % of these deaths(n=95/133) occurred in first 7 days of life (Table 1). We determined that 50 infants (29.9 %) died at their day of birth.

**Table 1.** The infant mortality and stillbirths statistics data in Samsun in 2007.

<b>Total births (Stillbirths + live births) (n)</b>	18892
<b>Live births (n)</b>	18801
<b>Stillbirths (n)</b>	91
<b>Early neonatal deaths (0-6 days) (n)</b>	95
<b>Late neonatal deaths (7-27 days) (n)</b>	38
<b>Neonatal deaths (0- 27 days) (n)</b>	133
<b>Post neonatal infants deaths (28-364 days) (n)</b>	34
<b>Perinatal Mortality Rate (%0)</b>	9.84
<b>Stillbirth Mortality Rate (%0)</b>	4.82
<b>Early Neonatal Mortality Rate (%0)</b>	5.05
<b>Late Neonatal Mortality Rate (%0)</b>	2.02
<b>Neonatal Mortality Rate (%0)</b>	7.07
<b>Infant Mortality Rate (%0)</b>	8.88

The results show that the perinatal mortality rate was 9.84 per 1000, and stillbirth mortality rate was 4.82 per 1000. Also, the data show that Neonatal Mortality Rate was 7.07 per 1000, of which early neonatal mortality rate was 5.05 and late neonatal mortality rate was 2.02. The infant mortality rate for the recent period was 8.88 per 1000. The infant mortality and stillbirths statistics data are given at Table 1.

When gestational age is taken into account, 69.5% of early neonatal deaths and 60.5% of late neonatal infant deaths are preterm babies (Table 2). In all groups there was a relationship between the gestation age and birth weight ( $P<0.05$ ). However, only 23.5% of postneonatal infant deaths (n=8/34) are born preterm; and only one case of those have birth weights under 2000g.

The most important causes of neonatal death were stillbirths, prematurity and interested problems. Infant's weight and gestational

**Table 2.** The main properties of neonatal and infant death cases in Samsun in 2007.

	Stillbirths	Early neonatal deaths		Late neonatal deaths	Post neonatal deaths
		0. gün	1 -6. gün	7-27.gün	28-364. gün
N	91 (%)	50 (%)	45 (%)	38 (%)	34 (%)
<b>Sex</b>					
Female	36 (39.6)	19 (38.0)	16 (35.6)	21 (55.3)	15 (44.1)
Male	51 (56.0)	23 (46.0)	29 (64.4)	13 (34.2)	19 (55.9)
Missing	4 (4.4)	8 (16.0)	-	4 (10.5)	-
<b>Mode of delivery</b>					
Vaginal birth	59 (64.8)	27 (54.0)	18 (40.0)	17 (44.8)	21 (61.7)
Cesarean section	31 (34.1)	21 (42.0)	26 (57.8)	19 (50)	13 (38.3)
Missing	1 (1.1)	2 (4.0)	1 (2.2)	2 (5.2)	-
<b>Gestational age</b>					
Preterm	63 (69.2)	38 (76.0)	28 (62.2)	23 (60.5)	8 (23.5)
Term	28 (30.8)	12 (24.0)	17 (37.8)	15 (39.5)	26 (76.5)
<b>Birth weight</b>					
< 999 g	18 (19.8)	13 (26)	7 (15.5)	8 (21.0)	-
1000-1499 g	20 (22.0)	13 (26)	9 (20.0)	7 (18.4)	1 (2.9)
1500-1999 g	10 (11.0)	8 (16)	7 (15.5)	6 (15.8)	-
2000-2499 g	10 (11.0)	3 (6)	5 (11.2)	2 (5.3)	5 (14.8)
2500-3999 g	27 (29.6)	12 (24)	15 (33.4)	13 (34.2)	27 (79.4)
> 4000 g	6 (6.6)	1 (2)	2 (4.4)	2 (5.3)	1 (2.9)
<b>Consanguinity</b>					
No	63 (69.2)	37 (74)	36 (80)	27 (71.0)	30 (88.3)
Yes	5 (5.5)	4 (8)	3 (6.7)	5 (13.2)	3 (8.8)
Missing	23 (25.3)	9 (18)	6 (13.3)	6 (15.8)	1 (2.9)
<b>Mother age (year)</b>					
Mean (SD)	29.19 (6.52)	26.90 (6.17)	26.55 (5.76)	28.83 (6.51)	25.48 (5.81)

age at birth were closely associated with their chances of survival. Sixty-seven percent of neonatal deaths and 69.2 % of stillborns were preterm born babies. Perinatal asphyxia was reported the reason of nine of infant deaths in the Infant Death Certificates.

## Discussion

Mortality rates calculated for neonatal and post neonatal periods in Samsun in 2007 are respectively lower than 17 per thousand and 12 per thousand which were the values reported

for Turkey in THDS-2003.2 We found stillbirth rate as 4.82 per thousand and perinatal mortality rate as 9.84 per thousand in our study. Also, stillbirth rate is lower than 13.0 per thousand value that was reported by THDS-2003.2

It was determined that early neonatal mortality rate was 17.2 per 1000, stillbirth rate was 18.0 per 1000 and perinatal mortality rate was 34.9 per 1000 in Turkey in 1999 at the hospital based multicenter perinatal mortality study of Turkish Neonatology Association. In this study in The Black Sea Region, perinatal mortality



rate, 71.9 per 1000; early neonatal mortality rate, 17.4 per 1000; and stillbirth, rate 17.4 per thousand were assessed to be high.<sup>3</sup>

It was reported that perinatal mortality and stillbirth rates were 87.7 and 49.7 per 1000 respectively, and early neonatal mortality rate was 39.9 per thousand in 1106 births at Ondokuz Mayıs University Faculty of Medicine, Samsun.<sup>5</sup> It is seen that our results are so unlikely when compared with the other two studies.

As indicated at the first study, finding the mortality rate lower than those in THDS-2003 and the other studies in hand reflects the results of the university hospitals which are the reference centers. Especially high risk pregnancies and births were accepted by these hospitals and realizing 7-10% of the births occurred in the clinics may act the statistic datas.<sup>3</sup> Also, during the study period, university hospital was the only neonatal intensive care unit in our province.

The study in which the Infant Death Certificates of Aydın province in 2004 assessed, declared a neonatal mortality rate of 7 per 1000, post neonatal mortality rate of 5.2 per 1000, infant mortality rate of 12.2 per 1000, stillbirth rate of 9.6 per 1000 and perinatal mortality rate of 14.8 per 1000.<sup>6</sup> Thus our results were closer to the values of this study, since in both two studies all infant deaths and stillbirths occurred in the two provinces were evaluated.

Our finding the infant and neonatal mortality rate lower than previously reported Turkish data, reflects the effectiveness of settled mother and child health care for a long time in Samsun. On the other hand we think that settling a neonatal intensive care unit with an insufficient capacity in Samsun Maternity and Children's Hospital and establishing the family practice in

2007 have significant effect on the results of the study.

As known deaths in perinatal period is due to prenatal problems, mother health care at birth, congenital anomalies and prematurity.<sup>1,7</sup> However, the results in Samsun introduce that preventing the death of infants it is necessary to attach importance to perinatal period especially.

In our study, one third of stillbirths were term babies. Death of a mature fetus like this is generally accepted preventable. It is considered that the reason of stillbirths in the third trimester must be researched and preventable ones should be appointed.

The most important causes of death were antepartum stillbirths, prematurity and related problems. To prevent these deaths, improving the quality of prenatal and postnatal care and decreasing the number of preterm births are the first precautions. Even though the postnatal deaths seem rarely it should be followed up the risks of this period.

Neonatal asphyxia is one of the most important causes of the early neonatal deaths in Turkey and all over the world. As the reported perinatal asphyxia rate of our study is lower the country rate, Neonatal Resuscitation Education Program which has been regularly performing in Samsun is thought to be so valuable.

Even though our findings reflect the decreasing rate of perinatal mortality, our results introduces that the pregnancies especially in third trimester should be carefully followed up. Also, reduction in the perinatal and neonatal mortality rate in Samsun is likely to be possibly only with improvement the factors that cause realizing the stillbirths, prevention of prematurity and improvement in neonatal intensive care.

## Conclusion

In this study neonatal and perinatal mortality rates in our province were found lower than the studies in the region have been done before and the average found in Turkey. Decreasing in these rates of our province reflects the development of basic health services organization in the years. Nevertheless reduction of our perinatal and neonatal mortality rates to the levels in developed countries, it is essential to investigate causes of deaths with advanced studies and to following up the antenatal period.

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# The Effects of Gender on Cesarean Rate and Birth Weight in Cases Without Risk Factors

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## Abstract

**Objective:** To investigate the effects of gender on cesarean rate and birth weight in cases without risk factors.

**Methods:** In this study, we have retrospectively evaluated the outcome of pregnancies of which cesarean section was performed because of fetal stress, between 2003 and 2008 in Zekai Tahir Burak Women Health and Education Hospital. High-risk pregnancies were excluded in the study. Maternal ages, gestational weeks, number of pregnancies, fetal birth weight, gender, and Apgar scores of all cases were analyzed. All data were evaluated by the Logistic Regression Analyses. The minimum limit for significance was accepted as 0.05.

**Results:** A total of 1747 pregnancies were evaluated. One thousand and twenty-six (58.7%) of them had male fetuses and 721 (41.3%) of them had female fetuses. Apart from most pregnancies terminated with Cesarean section because of fetal distress being male fetuses, 73.2% of babies, over 4000 grams were male and when compared with female fetuses (26.8%) the incidence was 3 times higher. When the newborns, whose Apgar score at the 1st minute  $\leq 6$  were evaluated, 62.8% of them were males and this incidence was twice higher than female fetuses (37.2%) ( $P < 0.05$ ).

**Conclusion:** Fetal distress risk during labor is higher for male fetuses. In addition, neonatal morbidity is also higher. Fetal birth weight being higher than 4000 grams is also more frequent among male fetuses.

**Keywords:** Fetal distress, fetal gender, perinatal morbidity.

## *Risk faktörü olmayan olgularda cinsiyetin sezaryen hızına ve doğum ağırlığına etkisi*

**Amaç:** Risk faktörü olmayan olgularda cinsiyetin sezaryen hızına ve doğum ağırlığına etkisinin araştırılması.

**Yöntem:** Bu çalışmada Mart 2003-Haziran 2008 yılları arasında Zekai Tahir Burak Kadın Sağlığı Eğitim ve Araştırma Hastanesinde, fetal distres gelişimi üzerine gebelikleri sezaryen ile sonlandırılan gebelerde gebelik sonuçları retrospektif olarak incelenmiştir. Çalışma kapsamına yüksek riskli gebeler alınmamıştır. Tüm vakaların maternal yaşları, gestasyonel haftaları, gebelik sayıları, fetal doğum ağırlıkları, cinsiyetleri ve Apgar skorları incelenmiştir. Tüm veriler Lojistik Regresyon Analizi kullanılarak değerlendirilmiştir.

**Bulgular:** İncelenen 1747 gebenin 1026'sı (%58.7) erkek fetusa, 721'i (%41.3) kız fetusa sahiptir. Fetal distres nedeniyle gebelikleri sezaryen ile sonlandırılan gebelerin çoğunun erkek fetusa sahip olmalarının yanı sıra, 4000 gr. üstünde doğan bebeklerin %73.2'si erkek olup bu oran kız fetusların (%26.8) yaklaşık 3 katıdır. 1. dakika Apgar skoru  $\leq 6$  olan yenidoğanların da %62.8'inin erkek olduğu saptanmış olup bu oran kız fetusların (%37.2) yaklaşık iki katıdır ( $p < 0.05$ ).

**Sonuç:** Erkek fetusların doğum eylemi sırasında strese girme olasılığı ve neonatal morbiditesi daha fazladır. Bu durum aynı zamanda erkek fetuslardaki 4000 gr üstünde doğum ağırlığının daha yüksek oranda olmasıyla da uyumludur.

**Anahtar Sözcükler:** Fetal distres, fetal cinsiyet, perinatal morbidite.

## Introduction

It is known that during pregnancy, starting from conception and ending with labor, pregnancy complications like spontaneous abortus, intrauterine exitus, early membrane rupture and preterm delivery associate male fetuses.<sup>1,5</sup>

Fetal distress which can develop during labor and problems at the early neonatal period are important reasons of neonatal mortality and morbidity at the neonatal period, following prematurity.<sup>1,3</sup> Among all pregnancies, the fetal gender of the spontaneous abortus and intrauterine exitus cases is predominantly male<sup>2,3,6,7</sup> Nevertheless, earlier studies demonstrated that the risk of fetal distress was higher in pregnancies carrying male fetuses.<sup>1,2,4</sup> Several possibilities were suggested at various studies, in order to explain the reason of this association, however, the most possible reason seemed to be the fetal birth weights of male fetuses being higher than female fetuses.<sup>1,3,4,8</sup>

In our study, the outcome of pregnancies that Cesarean section performed because of fetal distress development at term and spontaneous labor was prospectively evaluated.

## Methods

The records of cesarean sections performed at term, spontaneous labor, upon the indication of fetal distress at Zekai Tahir Burak Mother Health Training and Research Hospital between the March 2003-June 2008 were evaluated retrospectively. High-risk pregnancies (preeclampsia, intrauterine growth retardation, multiple pregnancies, preterm labor, presentation abnormalities) were excluded. Maternal ages, gestational weeks, number of pregnancies, fetal birth weights, gender, and Apgar scores at the 1st and 5th minutes were recorded for all cases. Fetal distress indication was depended on the external fetal monitorization performed during labor.

A total of 1747 pregnancies were included in our study and they were not only analyzed in terms of gender, but parameters like age, number of pregnancies, fetal birth weight, all of which could contribute to the development of fetal distress were also taken into account. All these parameters were compared by the Logistic Regression Analysis.  $P < 0.05$  was accepted as statistically significant.

**Table 1.** Maternal demographic and pregnancy characteristics.

Fetal gender	Male fetus (n = 1026)	Female fetus (n = 721)
Maternal Age, years (median)	24±8.3	25±6.6
Gravidity	2.7±1.8	2.8 ±1.4
Gestational age, weeks, day (median)	39±4	39±6
Primigravid	588 (53.3%)	416 (41.4%)
Multigravid	438 (59%)	305 (41%)
Fetal Birth Weight		
<2500 g	56 (53.3%)	49 (46.7%)
2500-4000 g	888 (58%)	642 (42%)
>4000 g	82 (73.2%)	30 (26.8%)

**Table 2.** The relationship between fetal gender and fetal birth weight.

Fetal birth weight	Gender		Total	P value
	Male	Female		
< 2500 g	56 (53.3%)	49 (46.7%)	105	0.63
2500 - 4000 g	888 (58%)	642 (42%)	1530	0.76
> 4000 g	<b>82 (73.2%)</b>	<b>30 (26.8%)</b>	<b>112</b>	<b>0.004</b>
Total	1026	721	1747	

## Results

A total of 1747 pregnancies were included in the study. All pregnancies included in the study were performed Cesarean section in terms of the fetal distress indication. Patient characteristics in terms of pregnancy and demographic characteristics are given at Table 1.

Among a total of 1747 pregnancies, 1026 (58.7%) had male and 721 (41.3%) had female fetuses, thus the majority of fetuses were male. While there were no differences among pregnancies with male and female fetuses in terms of age, number of pregnancy, and gestational age, when fetal birth weight was evaluated, we observed that rate of macrosomic fetus was higher among male newborns. When newborns with a fetal birth weight equal to or higher than 4000 grams were evaluated, 73.8% of them were male (8 % of all male newborns) and 26.8 % of them were female (4.2% of all female new-

borns) and this difference was statistically significant ( $p < 0.05$ ) (Table 2,3) (Graph 1).

The 1st and 5th minute Apgar scores of the male and female fetuses were examined. When the distribution of Apgar scores of 1747 newborns were compared in terms of gender, significant differences were observed. When the newborns whose 1st minute Apgar score  $\geq 6$  were examined, 62.8 % (279) of them were male and 37 % (165) were female and the difference had statistical significance ( $p < 0.05$ ) (Table 4) (Graph 2). When the newborns whose 5th minute Apgar score  $\geq 6$  were examined, 56.5 % (26) of them were male and 43.5 % (20) were female and the difference was not statistically significant. The 5th minute Apgar score was "0" for only one newborn and this case was a male (the 1st minute Apgar score of this newborn was "1" and his fetal birth weight was 4010 grams).

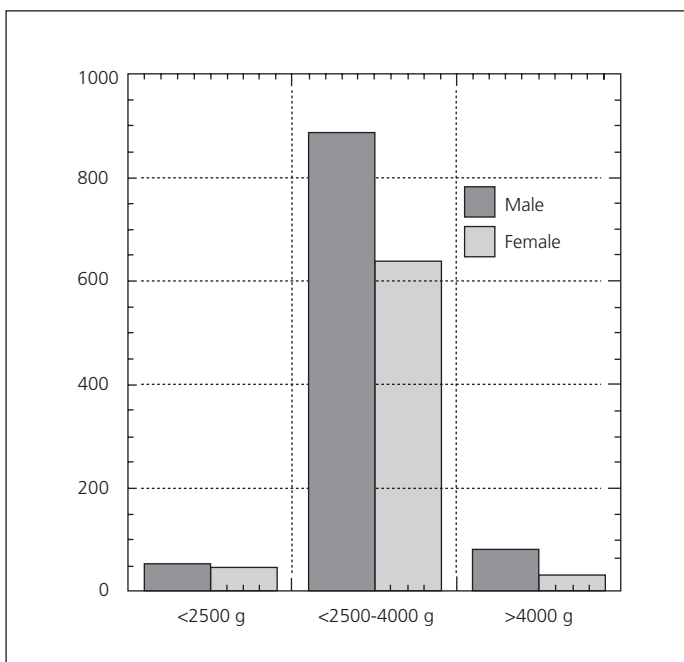
**Table 3.** Distribution of fetal gender in terms of fetal birth weight.

Gender	<2500 g	2500-4000 g	>4000 g
Male (n=1026)	56 (5.5%)	888 (86.5%)	82 (8%)
Female (n=721)	49 (6.8%)	642 (89%)	30 (4.2%)
Total n=1747	105 (6.0 %)	1530 (87.6 %)	112 (6.4 %)
			$p < 0.05$

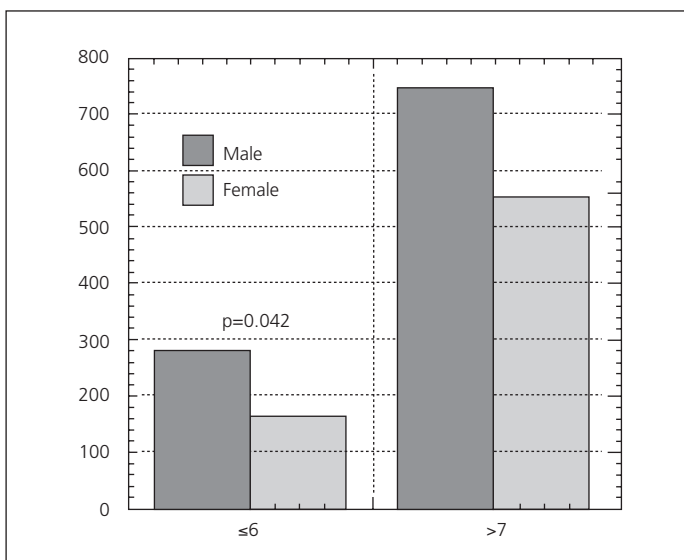
## Discussion

We examined a total of 1747 cases and they showed us that during labor the risk of fetal distress is higher for boys than girls. In a previous

study by Lieberman et al the rates of cesarean section and fetal distress were significantly higher among male fetuses.<sup>4</sup> Bekedam et al reported significant results in a larger study that evaluated only fetal distress.<sup>3</sup>



**Graph 1.** The relationship between fetal birth weight and fetal.



**Graph 2.** Distribution of 1st minute Apgar scores in terms of fetal gender.

In our study, apart from fetal distress, we demonstrated that the incidence of male fetuses increases in the newborn population whose fetal birth weight is equal to or higher than 4000 grams and this finding is in accordance with the study of Lieberman et al.<sup>4</sup> It is believed that the arrested labor due to macrosomic fetus contributes to the development of fetal distress.

Herman suggested that Y chromosome affects fetal growth rate thus making the male fetus macrosomic and increasing the metabolic rate.<sup>9</sup> This high metabolic rate may make male fetuses more susceptible to the critical alterations that can develop during labor. The risk of fetal stress being higher for male fetuses can not be illuminated. As a result, we demonstrated that fetal distress during labor is higher in male fetuses and perinatal morbidity is increased. Our case number is small thus our findings can not influence the present clinical practice but obstetricians should be more careful and ready for the complications that they can face during prenatal care. It is important that when fetal gender is assessed with ultrasound performed during prenatal care practices, the family should be informed and the obstetrician should be alert especially during the 3rd trimester. male fetuses is lower than females. In the study of Lieberman et al both the 1st and the 5th minute Apgar scores were significantly lower in males.<sup>4</sup> Depending on this, neonatal morbidity rates of the male fetuses increase.

## Conclusion

As a result, we demonstrated that fetal distress during labor is higher in male fetuses and perinatal morbidity is increased. Our case num-

ber is small thus our findings can not influence the present clinical practice but obstetricians should be more careful and ready for the complications that they can face during prenatal care. It is important that when fetal gender is assessed with ultrasound performed during prenatal care practices, the family should be informed and the obstetrician should be alert especially during the 3rd trimester.

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# The Effect Of Ramadan on Asymptomatic Bacteriuria, Urinary Tract Infections and Amniotic Fluid Index in Pregnancy

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## Abstract

**Objective:** To show the effect of 12 hours fasting in a day during Ramadan on asymptomatic bacteriuria, urinary tract infections and amniotic fluid index in pregnant patients.

**Methods:** This study was carried out in Obstetrics and Gynecology Department of Gaziantep University Hospital, between September 23th and October 23th in year 2006 (during Ramadan). Fourty-one consecutive healthy women with uncomplicated pregnancies of 20 weeks or more who were fasting during Ramadan were included in the study group (Group 1). The control group (Group 2) consisted of 31 healthy pregnant women who were not fasting during the study period. All of these patients evaluated with urinary dipstick test in the morning and at 5 pm. for urine osmolality, leucocyteuria, and bacteriuria. After determined a positive dipstick urine culture was performed. Urinary osmolality was also measured by dipstick test. Doppler ultrasonography was performed in all subjects in the beginning and at the end of Ramadan for the following the change of amniotic fluid index.

**Results:** The mean of urinary osmolality was higher in the fasting group. There was no statistically difference between two groups for asymptomatic bacteriuria and urinary tract infections rate. Amniotic fluid index was similar in two groups.

**Conclusion:** Twelve hours fasting in a day during Ramadan causes hypohydration and leads an increase urinary osmolality but, it does not changes the rate of asymptomatic bacteriuria and urinary tract infections in pregnancy.

**Keywords:** Ramadan, pregnancy, asymptomatic bacteriuria, urinary tract infections, amniotic fluid index.

## *Gebelerde oruç tutmanın üriner sistem enfeksiyonu ve amniotik sıvı indeksi üzerine etkisi*

**Amaç:** Gebelerde oruç sırasında 12 saatlik açlığın üriner sistem enfeksiyonu ve amniotik sıvı indeksi üzerine etkisini göstermektir.

**Yöntem:** Bu çalışma Gaziantep Üniversitesi Tıp Fakültesi Hastanesi'nde, Kadın Hastalıkları ve Doğum Anabilim Dalı'nda 23 Eylül-23 Ekim 2006 tarihleri arasında (Ramazan ayı süresince) gerçekleştirildi. Ramazan ayında oruç tutan 41 tane sağlıklı, 20. ve daha büyük gebelik haftasındaki gebeler çalışmaya alındı (Grup 1). Kontrol grubuna 31 tane oruç tutmayan sağlıklı, 20. ve daha büyük gebelik haftasındaki gebeler alındı (Grup 2). Hastaların tamamı üriner dipsticklerle her sabah ve akşam 5'te (iftardan hemen önce) osmolalite, lökositüri ve bakteriyüri için değerlendirildi. Pozitif dipstick analiz sonrası tüm hastalardan idrar kültürü alındı. Ramazan ayının başında ve sonunda amniotik sıvının indeksi doppler ultrasonografi ile ölçülerek değişiklik olup olmadığına bakıldı.



**Bulgular:** Ortalama idrar osmolalitesi oruç tutan hastalarda daha fazla idi. Üriner sistem enfeksiyonlarının sıklığı açısından iki grup arasında istatistiksel olarak anlamlı bir fark yoktu. Amniyotik sıvı indeksi iki grup arasında benzer tespit edildi.

**Sonuç:** Gebelerde Ramazan ayı boyunca 12 saatlik açlık hipohidrasyona sebep olarak idrar osmolalitesinde artışa neden olmaktadır. Ayrıca üriner sistem enfeksiyonu sıklığını değiştirmemektedir.

**Anahtar Sözcükler:** Ramazan, gebelik, asemptomatik bakteriüri, idrar yolu enfeksiyonları, amniotik sıvı indeksi.

## Introduction

During the religious festival of Ramadan, practising Muslims refrain from eating, drinking, smoking and sexual relationships during the hours of daylight throughout the lunar month.<sup>1</sup> Generally, meal frequency is reduced during Ramadan fasting, which it has been found often leads to reduced energy intake and loss of body mass and body fat. Any loss in body mass index is usually relatively small and it may also be attributed to a decrease of glyco-gen-bound water stores, extracellular volume concentration secondary to a lower sodium intake, and a moderate degree of hypohydration with little loss of body tissue.<sup>2</sup> Hypohydration is a risk factory for asymptomatic bacteriuria and urinary tract infections in pregnancy. Pregnant women with asymptomatic bacteriuria have an increased risk of pyelonephritis and there is a strong association between asymptomatic bacteriuria and preterm and low birth weight delivery.<sup>3,4,5</sup>

Our aim was to evaluate the effect of Ramadan fasting on asymptomatic bacteriuria and urinary tract infections in pregnant women.

## Methods

This study was carried out in Obstetrics and Gynecology Department of Gaziantep University Hospital, between September 23th and October 23th in year 2006 (during Ramadan). Fourty-one consecutive healthy

women with uncomplicated pregnancies of 20 weeks or more who were fasting during Ramadan were included in the study group (Group 1). The control group (Group 2) consisted of 31 healthy pregnant women who were not fasting during the study period. For evaluating Ramadan's effect on asymptomatic bacteriuria and urinary tract infections in pregnant women, we evaluated all patients with dipstick urinalysis in the morning and just before breaking the fasting (at 5 pm).. Positive urinalysis was defined as a dipstick result that shows positive nitrites and/or more than 1+ leucocytes, blood or protein. Any patient who has a positive dipstick test evaluated with a midstream urine culture. A positive midstream urine specimen was defined as a pure growth >100 000 organisms in urine on laboratory culture. Asymptomatic bacteriuria was treated with oral cephalixin in all cases. Examinations by Doppler ultrasonography were performed once a week to all subjects for the moniterization of amniotic fluid index (AFI) during the Ramadan. High definition image (HDI; A 3.5 MHz convex transducer, Applio- Toshiba, Otamara, Japan) was used to obtain AFI. Amniotic fluid index was calculated by the sum of deepest vertical pocket in 4 uterine quadrants measured in sonography. Oligohydramnios is defined as amniotic fluid index of  $\leq 5$  cm.<sup>6</sup> To remove the effect of other factors causing oligohydramnios and polihydramnios, all cases with urinary or skeletal anomalies, intrauterine growth retardation,

**Table 1.** Comparison of the maternal data between fasting and non-fasting groups.

	Group 1 (n=41)	Group 2 (n=31) Control	P
Maternal age (years)	23.4 (22.6-25.9)	24.4 (22.5-26.0)	0.567
Parity	2.3 (1.8-2.7)	2.6 (2.5-3.0)	0.432
Gestational Age (weeks)	29 (20-38)	30 (25-39)	0.857
Oral fluid intake (l/day)	2.6 (2.0-2.8)	2.9 (2.5-3.3)	0.641
The change of BMI	0.43±0.12	0.39±1.2	0.389
Oral intake (hours)	9.3 (8.0-9.7)	2.1 (2.0-2.6)	0.001

multiple pregnancy, diaphragmatic hernia, diabetes, fetal hydrops and premature rupture of membrane were excluded from the study.

## Results

All comparisons between the groups were done by t-test or Mann Whitney Rank Sum test where it is appropriate. Sigma Stat 3.0 was used for statistical analysis. P value <0.05 was accepted as significant.

No significant difference was found between the two groups for maternal age, and pregnancy weeks. There was no statistically difference between two groups for asymptomatic bacteriuria (p=0.490). Ten patients in Group 1 ten patients (2.4%), in Group 2 eight patients (2.5%) had asymptomatic bacteriuria and treated by oral cephalosporin. In Group 1, there are only two patients had urinary tract infections (4.8%), in first case midstream urine culture was positive for E.Coli and treated successfully

with intravenous cephalosporin in 27th pregnancy weeks. In second patients, midstream urine culture was positive for , streptococcus, and treated with parenteral ampicillin-sulbactam. In Group 2, only one patient (3.2%) had urinary tract infection due to E.Coli and treated with parenteral cephalosporin in 25 th pregnancy weeks. There was no statistically difference between two groups for urinary tract infections (p=0.54).

AFI was did not change during the Ramadan and there was no difference between two groups (p=0.434). Urine osmolality was significantly increased in fasting group during the Ramadan (p=0.01).

## Discussion

During the daylight hours of Ramadan fasting, practising Muslims are undoubtedly dehydrating at a rate that is determined by the loss

**Table 2.** Comparison of the results between two groups.

	Leucocytes in urine	The mean of urine osmolality (mosm/kg)	Dysuria	Asymptomatic Bacteriuria	Urinary Tract Infections	AFI (mm)
Group 1 (Fasting n=41)	18	645 ± 0.3	3	10	2	12.9 (12.1-14.0)
Group 2 (non-fasting n=31)	15	523 ± 0.1	2	8	1	13.3 (12.5-14.6)

of body water minus the amount of metabolic water that is produced over this period.<sup>7</sup> No definitive evidence has been found to show that a susceptibility to urinary tract infection is influenced by fluid intake.<sup>8</sup> In three reports, urinary tract infections was associated with a low fluid intake or low urine output.<sup>9-11</sup> In two prospective studies in girls, recurrent urinary tract infections was associated with infrequent urine voiding and poor fluid intake. A study in adults with urinary catheters showed that low urine output was significantly related to urinary tract infections.<sup>11</sup> Water deprivation is functionally characterized by maximum urine concentration. In 20 Malaysian Muslims, urine was collected before, during and after Ramadan fasting each in the morning (0800-1200), afternoon (1200-1600) and overnight (1600-0800). The authors found that Ramadan fasting did not affect the overnight urine volume or osmolality (means: 649-781), indicating that the subjects were probably not subjected to severe water deprivation.<sup>12</sup> In another study, urinary osmolality was higher during Ramadan than either before or after Ramadan.<sup>7</sup> In our study, urinary osmolality was significantly higher just before breaking the fast (at 5 pm).

Urinary tract infections are a common complication of pregnancy. Symptomatic urinary tract infections occurs in 1% to 2% of pregnancies, while asymptomatic bacteriuria has been reported in 2% to 13% of pregnant women.<sup>3,4</sup> In this study, urinary osmolality was significantly higher just before breaking the fast (at 5 pm) but, there was not statistically difference between two groups for asymptomatic bacteriuria (2.4% versus 2.5%, and  $p=0.490$ ). Pregnant women with asymptomatic

bacteriuria have a 20-30 fold increased risk of developing pyelonephritis compared to women without bacteriuria.<sup>13,14</sup> Antimicrobial treatment of asymptomatic bacteriuria during pregnancy decreases the risk of subsequent pyelonephritis from 20-35% to 1-4%.<sup>14</sup> Therefore, we treated all of these patients to prevent the risk of pyelonephritis.

In our study, the urinary osmolality was higher than control group but urinary tract infections rate was similar in both groups (4.8 % versus 3.3%,  $p=0.54$ ). We also suggested to all patients in two groups to drink at least 2 liter water during the day. It could be prevent hypohydration and urinary tract infections.

## Conclusion

Ramadan changes urinary osmolality during the fasting hours, but does not affect the rate of asymptomatic bacteriuria and urinary tract infections in pregnancy.

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# Fetal Megacystis and Trisomy 18 Association: Case Report

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## Abstract

**Objective:** We aimed fetal megacystis existance, which is frequently seen together chromosomal anomalies, to discuss a case report.

**Case:** The pregnancy of a patient who is 31 years old and whose pregnancy is detected fetal megacystis in 14 weeks and detected trisomy 18 by amniocentesis which is made in 16 weeks is terminated in Ağrı Maternity and Children Hospital.

**Conclusion:** In fetal megacystis, it is detected 25 chromosomal defects of fetuses whose fetal bladder longitudinal diameter between 7-15 mm. From this defects the most frequently seen are Trisomy 13 and likely in our case Trisomy 18. 90% of the cases recover not to develop any sequela or adverse effects in chromosomally normal group. In this case report, we discussed a case which is cooperated with fetal megacystis and Trisomy 18.

**Keywords:** Fetal megacystis, ultrasonography, trisomy 18.

## *Fetal megasist ve trizomi 18 birlikteliği: Olgu Sunumu*

**Amaç:** Kromozomal anomaliler ile birlikteliği sıklıkla izlenen fetal megasist varlığı sunumunu amaçladık.

**Olgu:** Ağrı Kadın Doğum ve Çocuk Hastalıkları Hastanesinde otuzbir yaşında ve gebeliğinin 14. haftasında fetal megasist saptanan bir olgunun 16. gestasyonel haftada yapılan amniosentez sonucu Trizomi 18 olarak saptanması üzerine hastanın gebeliği Ağrı Kadın Doğum ve Çocuk Hastalıkları Hastanesinde termine edildi.

**Sonuç:** Megasist, gebeliğin 10-14.haftasındaki fetal mesane longitudinal çapı 7-15 mm üzerinde olan fetusların %25inde kromozomal defektler saptanmaktadır. Bu defektlerden en sık görülenleri Trisomi 13 ve bizim olgumuzda olduğu gibi trisomi 18'dir. Kromozomal olarak normal olan grupta sonrasında herhangi bir sekel ya da yan etki gelişmeksizin olguların %90'ında spontan düzelme saptanmaktadır. Megasist ve kalın NT nedeniyle amniosentezde uygulanan ve trizomi 18 tanısı konulan olguyu sunmayı amaçladık.

**Anahtar Sözcükler:** Fetal megasist, ultrasonografi, trizomi 18.

## Introduction

Fetal megasistis which is >7 mm of fetal bladder longitudinal diameter is seen in 1/5000 births. Bladder is an organ in abdomen which is diagnosed simply and fastly with stomach.<sup>1</sup> The routine anomaly screening of pregnancy between 18-20 weeks in 15-20 minutes, the

bladder is always seen in all cases. A normal fetus mictures regularly but never definitely empty and always contain somehow residue urine.<sup>2</sup>

Fetal megasistis is two main reason. In the first reason, there must be a problem in the urine output, this case is in the men mainly the

result of the false development of the urethra. The spectrum of the anomalies changes complete urethral atresia to urethral valves that of membranous/prosthetic urethra.<sup>3</sup> Bladder obstruction of women is usually the result of the complex defects of the development of the urogenital system and called 'anomalies of the cloacal bed'. Second group is bladder growth due to nonobstructive factors. These are heterogen group because of the underlying complex pathologies. Among of these neuropathic bladder, obstruction of the small intestines due to muscle degeneration, megacystic microcolon intestinal hyperperistalsis syndrome and Prune Belly syndrome.<sup>4</sup>

### Case

There isn't an of the patient who first in 14 weeks; in 31 years gravida 5, parity 4, live 4. There isn't an in family anemnesis and laboratory tests were normal. The fetal bladder longitudinal diamater was 19mm and amniotic fluid was normal in the obstetric ultrasonography (Picture 1). NT measurement was 3.2mm. There isn't another finding in ultrasonography. Because of the detection of the same results of the patient's ultrasonographic examination which is made in 16 gestational weeks, amnio-

centesis process is performed. Because of the result of the amniocentesis Trisomy 18, the pregnancy of the patient is terminated by getting permission of the family.

### Discussion

In the %25 of the fetuses whose bladder longitudinal diamater is 7-15mm in 10-14 weeks of the pregnancy, it is detected chromosomal defects. Among of these defects the most seen are Trisomy 13 and like our case Trisomy 18. In the chromosomally normal group 90 percent of the cases is improved not to develop any sequela or adverse effect. In the contrary, in the cases of the bladder diamater >15mm the chromosomal anomaly ratio is 10%; but the chromosomally normal cases in this group always together progressive obstructive uropathy.<sup>5</sup> The treatment of the megasistis changes depend of the underlying pathology. If the megasistis develop in the early period of the pregnancy, usually the cause is urethral atresia and these cases are fatal. The being of the obstruction partial or complete effect the treatment. In the detection of the obstruction the best method is measuring of the amniotic fluid level. The obstruction is getting increase the amniotic fluid miktarı is getting decrease. In the cases of



Picture 1. Appearance of the fetus.

the oligohydramnios the bladder is emptied by making vesico-amniotic shunt. This perform can be make 3-4 times. It is protected from pulmonary hypoplasia which develops in the cases of the oligohydramnios. In the group of the amniotic fluid level is normal, the treatment of the can be make. Assessing the neuropathic causes of the bladder distension is is harder and the worth of the inutero treatment of this causes isn't and it is needed long time randomised studies in this topic.<sup>16</sup> Megacystis is in the %75 of the chromosomally abnormal cases and in the %30 of the chromosomally normal cases along with the increased NT. The underlying mechanism of the increasing NT in the fetal megacystis may be thoracic compression.<sup>5</sup> In the cases of megacystis which bladder 7-15mm, if the fetal caryotype is normal it is told to parents megacystis will improve in the 90% percent of the cases not to cause any adverse effect of kidney development and function. Because of the bladder smooth muscles and autonomic innervation develop after the 13.week; in the pregnancies less than 13 weeks bladder wall is connective tissue no epithelium and contractile element. For this reason, the assesment of this group patients is left to 14. weeks which the bladder completely develop.

## Conclusion

In fetal megacystis, it is detected 25% chromosomal defects of fetuses whose fetal bladder longitudinal diameter between 7-15mm. From this defects the most frequently seen are Trisomy 13 and likely in our case Trisomy 18. 90% of the cases recover not to develop any sequela or adverse effects in chromosomally normal group. In this case report, we discussed a case which is cooperated with fetal megacystis and Trisomy 18.

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