Impact of sociodemographic attributes on high-risk pregnancy

Sosyodemografik özelliklerin yüksek risk gebelik üzerine etkileri

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SUMMARY

Objective: Identifying the association between sociodemographic data and laboratory parameters, and the complications occurring during the pregnancy monitoring.

Method: This study reviewed 127 high-risk pregnant women (HRP) and other 99 pregnant women in control group. The sociodemographic data and laboratory results of pregnant women with HRP diagnosis and the pregnant women in control group were compared.

Results: Comparing the sociodemographic data and laboratory parameters of pregnant women with HRP diagnosis and the pregnant women in control group, it was found that period of marriage, aPTT, AST, ALT, Chlorine and BUN levels were significantly higher in HRP group($p<0.05$). After classifying the pregnant women diagnosed with HRP among themselves, no difference was found in terms of sociodemographic data($p>0.05$), whereas the BUN, creatinine, AST, ALT and potassium values in hypertension group induced by pregnancy were higher on statistically significant level compared to the control group($p<0.05$). On the other hand, calcium values, PT and INR were significantly lower ($p<0.05$). In macrosomia patients, PT and INR were significantly higher ($p<0.05$). In preterm labor group, white blood cell and neutrophil counts were higher on statistically significant level ($p<0.05$). High level of chlorine in the pregnant women diagnosed with amniotic fluid disorders, preterm labor and macrosomia was statistically significant compared to the control group ($p<0.05$).

Conclusions: The challenge remains to estimate beforehand the high-risk conditions occurring during pregnancy monitoring despite finding differences in sociodemographic and laboratory data.

Keywords : High-risk pregnancy, maternal mortality and morbidity, and sociodemographic data

ÖZET

Amaç: Sosyodemografik verilerin ve laboratuvar parametrelerinin gebelik izlemi sırasında meydana gelen komplikasyonlarla ilişkisinin belirlenmesi

Yöntem: Bu çalışmada 127 yüksek riskli gebe(YRG) ve kontrol grubundaki 99 gebe incelendi. YRG tanısı alan gebeler ile kontrol grubu gebelerin sosyodemografik verileri ve laboratuvar sonuçları karşılaştırıldı.

Bulgular: YRG tanısı alan hastalarla, kontrol grupları arasında sosyodemografik ve laboratuvar parametreleri açısından veriler karşılaştırıldığında, evlilik süresi, aPTT, AST, ALT, Klor ve BUN düzeyleri YRG grubunda anlamlı düzeyde yüksek tespit edildi($p>0.05$). YRG tanısı alan gebeler kendi aralarında sınıflandırıldıktan sonra, incelemede sosyodemografik veriler açısından fark bulunmazken($p>0.05$), gebeliğin indüklediği hipertansiyon grubunda BUN, kreatinin, AST, ALT ve potasyum değerleri kontrol gurubuna göre istatistiksel olarak anlamlı düzeyde yüksek saptandı ve kalsiyum değerleri, PT ve INR ise anlamlı düzeyde düşük bulundu ve PT ve INR makrozomi hastalarında anlamlı olarak yüksek saptandı($p<0.05$). Preterm eylem grubunda, beyaz küre ve nötrofil sayısı kontrol grubuna göre istatistiksel olarak anlamlı düzeyde yüksek saptandı ($p<0.05$). Amnion mayi bozuklukları, preterm eylem ve makrozomi saptanan gebelerde klor düzeyinin yüksekliği, kontrol grubuna göre istatistiksel olarak anlamlı bulundu($p<0.05$).

Sonuç: Sosyodemografik ve laboratuvar verilerinde farklılıklar saptanmasına rağmen gebelik izlemi esnasında ortaya çıkan yüksek riskli durumları önceden tahmin etmenin zorluğu halen devam etmektedir.

Anahtar sözcükler: Yüksek riskli gebelik, maternal mortalite ve morbidite, sosyodemografik veriler

INTRODUCTION

One of the most important decisions in human life is having a baby. Pregnancy and birth is a period requiring a serious biopsychosocial adaptation for the parents as well as being a physiological process. Besides being a source of happiness, satisfaction, maturity and joy, pregnancy can also cause anxious waiting, worries and overload. Pregnancy is the process where changes occur in women's psychological and social condition, family, and roles in the workplace, and parental relations are established between infants and mothers [1, 2]. Although pregnancy is a physiological event, a pathological condition affecting the health of the mother and infant can occur in 5-20% of pregnancies [3]. All such pregnancies might create risks for healthy women [4].

The pregnancy where the risk of morbidity and mortality of the mother or fetus increases at remarkable levels is regarded high-risk pregnancy[5]. In other words, the pregnancy where the health or life of the fetus or infant in new-born period is/might be fully or partially at risk is defined as "high-risk pregnancy (HRP)" [6, 7].

Overall, antenatal bleeding occurs in 3% of pregnancies, and poly/oligohydramnios in 0.2 to 3%, and hypertensive diseases in 12-22%, and IUGG in 4-30%, and preterm labor in 11.9%, and multiple pregnancies in 3%, and diabetes mellitus in 7% and severe hyperemesis gravidarum in 0.5-1% among the reasons of pregnancies carrying risk as found during the pregnancy monitoring [8].

Epidemiological and observational studies have shown that good antenatal care from early pregnancy period reduced mother and infant mortality and provided more positive pregnancy results [9]. In order to achieve a healthy perinatal result on the highest level, it is vital to define high risk factors at an early stage in terms of implementing appropriate and timely treatment [5]. Present risks might be revealed during the first antenatal examinations and early precautions might be taken with suitable follow-up, and this might help to reduce morbidity and mortality rates [3, 10].

In our study, we examined the pregnant women diagnosed with HRP and those found as normal pregnancies, and then identified the association between sociodemographic data and laboratory parameters, and complications occurring during pregnancy monitoring in order to provide required approaches for reducing morbidity and mortality of mothers and infants in pregnancies carrying risk.

MATERIAL AND METHODS

After obtaining the approval of ethical committee of Cumhuriyet University, 127 women diagnosed with HRP during their pregnancies were determined as the study group, while 99 pregnant women who were not diagnosed with HRP were determined as the control group after being admitted in Gynecology and Obstetrics Clinics of Research and Application Hospital of Faculty of Medicine Cumhuriyet University. The diagnosis was made as a result of anamnesis, physical examination, USG, laboratory and NST (non-stress test) examinations. HRP diagnoses were classified under the headings: those with a hypertensive course, macrosomia cases, amniotic fluid disorders, intrauterine growth retardation (IUGR), preterm labor, and multiple pregnancy. Since they would not present statistical significance, the pregnant women diagnosed with placenta previa, Gestational diabetes mellitus (GMD), fetal anomaly, malrotation, liver function disorder, DVT (deep venous thrombosis) and thrombocytopenia were gathered under the category "others". Those not placed into this group were accepted as the control group.

Patients' sociodemographic data, educational status, socioeconomic status, place of living, the number of individuals living in the same house, the period of marriage, educational status of the husband, occupation of the husband, blood relations, blood group, obstetric history, gravida-para-abortus-curettage numbers, previous delivery form and smoking history were inquired. Among the pregnancy data of the patients, NST, form of delivery, anesthesia type, ultrasound (USG) measurements, placenta orientation, amniotic fluid amount; and new-born infant's weight, Apgar score, and hospitalization in new-born service and all laboratory data of the patients were retrieved from patient files and recorded. In terms of educational status, those with an educational background of 8 years or less were considered as primary school graduates and lower, and those with 8 to 12 years of background were considered as secondary school graduates, and those with more than 12 years of background were considered as higher education graduates. In terms of socioeconomic status, those receiving minimum wage were considered to have moderate income, and those receiving less wage were considered to have low income, and those receiving wages higher than minimum wage were considered to have good income. The place of living was considered under three categories: rural, town and urban. In terms of

the occupation of the husbands, those without a steady job were considered as unemployed, and those working for someone in a workplace as employees, and those doing their own job as freelancers, and those working for a public organization as civil servants.

Statistical Analysis

The data obtained as a result of the study were loaded into SPSS (ver. 22.0) software. Since parametric test assumptions were applied in assessment of the data (Kolmogorov-Smirnov), the significance test, variance analysis and LSD test of the difference between two averages in independent groups were used. In assessment of the data obtained through count, chi-square test was used. When chi-square assumptions were not met in multispan design, Monte Carlo model among chi-square exact tests was used to calculate chi-

square value, and level of significant was set as 0,05.

RESULTS

226 pregnant women admitted in Gynecology and Obstetrics Clinic were evaluated in this study. 127 of these pregnant women (56.2%) with HRP diagnosis and 99 pregnant women (43.8%) as control group were included in the study.

Among those with HRP, 22 cases (17.3%) were identified as hypertensive diseases, and 14 cases (11%) as macrosomia, and 16 cases (12.6%) as amniotic fluid disorder, and 19 cases (15%) as IUGR, and 24 cases (18.9%) as preterm labor, and 15 cases (11.8%) as multiple pregnancy, and 17 cases (13.4%) as "others" (Table 1).

Table 1. Distribution of high-risk pregnancy groups

PIH	22	17.3 (%)
Macrosomia	14	11.0 (%)
Amniotic fluid disorders	16	12.6 (%)
IUGG	19	15.0 (%)
Preterm labor	24	18.9 (%)
Multiple pregnancy	15	11.8 (%)
Others	17	13.4 (%)
Total	(n=127)	100 (%)
PIH: Pregnancy induced hypertension IUGG: intrauterine growth retardation		

There were no statistically significant difference between the two groups in terms of age averages, height averages, bodyweight averages before conception, body mass index averages, averages of the number of individuals living in the same house, weight gained during pregnancy, educational status of pregnant women, their husbands' occupation, smoking habit of pregnant women, place where pregnant women live, sex of the new-born,

placenta orientation, blood groups, Rh, fasting blood glucose, creatinine, LHD, sodium, potassium and calcium values, PT and INR (p>0.05). Nevertheless, BUN, AST, ALT, Chlorine, aPTT values and risks during pregnancy in patients with high risk were higher on a statistically significant level in the pregnant women with longer marriage period in terms of marriage period(p<0.05) (Table 2).

Table 2. Demographic characteristics and laboratory findings of study groups

	Patients (n=127)	Controls (n=99)	p
Age (years)	29.7±5.9	28.9±5.9	0.31
BMI (kg/m^2)	25.7±5.0	25.4±5.0	0.71
People living in a house	3.6±1.7	3.8±1.6	0.49
Obstetric history			
Gravidity (n)	2.6±1.6	2. 7±1.6	0.83
Parity (n)	1.2±1.3	1.2±1.2	0.94
Abortion (n)	0.4±0.6	0.5±0.9	0.41
D & C (n)	0.1±0.3	0.1±0.1	0.20
Highest level of education			
Primary	81(63.8 %)	54(54.5%)	
Secondary	17(13.4%)	21(21.2%)	0.23
Higher	29 (22.8%	24(24.2%)	
Place of living			
Rural	17(13.4%)	16(16.2%)	
Town	22(17.3%)	21(21.2%)	0.57
Urban	88 (69.3%)	62(62.6%)	
Economic status			
Lowest	13(10.2%)	11(11.1%)	
Middle	51(40.2%)	34(34.3%)	0.67
Highest	63(49.6%)	54(54.5%)	
Biochemical tests			
Creatinine(mg/dL)	0.5±0.2	0.5±0.1	0.28
LDH (U/L)	244.2±93.6	273.7±281.6	0.27
Sodium (mEq/L)	135.0±2.1	134.6±1.8	0.17
Potassium (mEq/L)	4.1±0.3	4.1±0.3	0.68
Calcium (mEq/L)	8.5±0.5	8.6±0.4	0.23
BUN (mg/dL)	8.3±3.2[a]	7.4±2.2	**0,01**
AST (U/L)	24.9±17.3[b]	21.0±6.3	**0,02**
ALT (U/L)	17.0±18.6[c]	12.1±5.3	**0,01**
Chlorine (U/L)	106.0±2.1[d]	105.0±2.2	**0,01**
Hematologic tests			
White blood cells (10^3/mL)	10.6±3.2	10.1±2.6	0.34
Hematocrit (%)	37.0±3.7	36.6±4.6	0.34
Hemoglobin (g/dL)	12.5±1.4	12.2±1.6	0.21
Platelet count (10^3/μL)	209.1±56.5	210.4±59.2	0.90
Coagulation tests			
PT (sec)	11.0±7.8	10.2±0.6	0.21
INR (Sec)	1.0±0.1	0.9±0.1	0.22
aPTT (Sec)	27.0±3.6[e]	25.0±3.1	**0.02**

Data were presented as mean ± SD, and percentage as appropriate.

[a,b,c,d,e]p <0.05 vs. controls.
BMI: Body mass index;D&C: Dilatation & Curettage;
LDH, Lactate dehydrogenase;BUN, blood urea nitrogen;

AST: aspartate aminotransferase; ALT: alanine aminotransferase;

PT,Prothrombin time ; INR, international normalized ratio;

aPTT, activated partial thromboplastin time.

DISCUSSION

Risky pregnancies, can defined mostly as carrying increased morbidity or mortality risk after or before birth of mother, fetus or newborn. All risk factors for pregnancy, are classified according to periods during the pregnancy [8].

According to data of 2013 of Turkey Demographic and Health Survey, women in Turkey have their highest fertility in their twenties age. The specific fertility rate of highest age are in the age group of 25-29 ages [11]. 249 (54.8%) pregnants in studies done by Kölgelier S.et al. [12] are in the age group of 26-35. By studies done from Bektaş E. [13], pregnants in age group of 25-34, constitutes 54.5 % of whole study. By these or similiar studies the pregnants are evaluated according to classified age groups but pregnants who are included in our study were not classified in age groups. The evaluation were done by calculating of age average from control and case group and accordingly the age average from all pregnants are determined as 29.34, the age average from control group are determined as 28.88 and the age average of high risk pregnant women are determined as 29.69. By comparing of averages of both age groups, no significant difference was found. In studies of Şahsıvar M.[3] were similiarly also the age average of high risk pregnants and control groups evaluated, but no significant difference was found.

When high risk pregnancy diagnoses of 50 women, who have risky pregnancies are examined in the study; by 32% are preterm labor, by 12 % hypertensive diseases, by 10 % premature separation of placenta, by 8 % premature rupture of membranes, by 8 % threatened abortion, by 6 % oligohydramnios, by 4 % placenta praevia, by 4 % IUGR, by 2 % severe hyperemesis gravidarum, by 2 % gestational diabetes mellitus was found[14]. In another study, which are done on 89 risky pregnant women, by 69 % preterm labor, by 10 % placenta praevia, by 10 % premature rupture of membranes diagnostics were found [15]. In our study were made by 18.9 % preterm labor, by 17.3 % Hypertension induced by pregnancy, by 15 % IUGR, by 12.6 % amniotic sac defects, by 11.8 % multiple gestation, by 11 % macrosomia, by 3.9 % placenta praevia, by 3.1 % gestational diabetes, by 1.6 % malrotation, by 1.6 % fetal anomalies, by 1.6 % liver dysfunction, by 0.8 % deep venous thrombosis and by 0.8 % thrombocytopenia diagnostics.

Many studies about effects from educational status to pregnancy of pregnant women has been done [14, 16, 17]. In a study of Pisirgen T.[16] pregnant women , who have the diagnostic of risky pregancy, 66,7 % are graduated from primary school, 24 % are graduated from high-school and 29,3 % are graduated from university. In cases without risky pregnancy 29,3 % are graduated from primary school, 40,0 % are graduated from high- school, 30,7 % are graduated from university. In studies of Pesavento et al. [14], 6 % of pregnants without risk and 24 % of risk pregnants have education in primary school degree, 58 % of pregnants without risk and 58 % of risk pregnants are have education in high school degree, 36 % of pregnants without risk and 18 % of risk pregnants have education in university degree. When the risk status of pregnancies of pregnant women are examined according to their educational level, on studies of Kılıç et al.[17], which has done in Turkey on 200 pregnants, no statistically significant difference are determined. In our study were not determined any significant connection between education level and risky pregnancy.

In studies, were not seen effects of sociodemographic attributes as, number of persons living at home, consanguineous marriages, smoking status of pregnant women, parity, abortus, education level of husband, on risky pregnancy [3,16,17]. We have determined, that the abovementioned parametres have no effects on high risk groups.

In some studies, by pregnant's husbands who are officer, were seen a low frequency of risky pregnancy [3,18]. In another contrary study, were found, that husband's occupation has no any connection to high risk group [16]. In our study were similiarly seen, that husband's occupation has not any relation to high risk group.

In studies were seen, that cases with high risk group diagnostics has low income and also the number of pregnancy are 4 and up [3, 16]. In contrary of this, were indicated that the total monthly income and number pregnancy has no relation to pregnancy risks [17]. In our studies were determined that the income status and number of pregnancy has no relation with high risk group.

In comparison with biochemical tests, in our studies were by high risk group high value of BUN, AST, ALT and chlorine determined. By evaluation after classification of high risk group, were found high values of BUN, creatine, AST and potassium only in group with hypertensive, and low value of calcium were found only with hypertensive. The evaluation result after high risk group classified, high value of ALT were found in hypertensive and in other pregnancy group topics. This could be caused of hepatic damage by hypertensive pregnants, and in diagnostics under other topics

could be caused by pregnants with isolated liver dysfunction diagnostic [19]. Karabi et al.[20] found out, that in cases of hypertension induced by pregnancy, the value of calcium are low and values of BUN, creatin, potassium and AST are high. From the point of coagulometric tests, in high risk group only a high value of aPTT was found out. But in analysis after self- classificiation of high risk group could not found any significant differences. By pregnant with hypertensive was the level of PT and INR low, by pregnant with macrosomia diagnostic was the level of PT and INR high.

By comparing of serum chlorine level in our studies, the difference between both groups was found statistically significant. By evaluation after classification of high risk group was by pregnants in group of macrosomia, amniotic sac defects and preterm labor indicated a high level of chlorine. In spite of decrease of chlorine level during pregnancy, the high level of chlorine in some risk groups here, could indicate to dehydration, renal tubular acidosis, diarrhea.

In our studies was also the blood parameters analyzed. By comparing of hemogram values of both groups were in spite of not any significant differences, in analysis, which are done after self-classification of high risk group, it have been detected that the blood cell count and neutrophil count are significantly high. This could be arise from infections, which are the most frequent reason for premature rupture of membranes that constitues 25 % of preterm labor [21].

In conclusion, although sociodemographic attributes and significant differences are determined in laboratory findings, the difficulty to forecast complications which arises during pregnancy follow-up continues. And this topic is still one of the most important topics, which need to be dealt not only by gynaecologist indeed by all health personnel.

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