Clinical Research

Evaluation of Prenatal and Perinatal Outcomes of Pregnant Women Born in Syria and Turkey, Results of a Tertiary Center

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ABSTRACT

Objective: The factors affecting the health of women and babies in the prenatal and perinatal periods may differ according to ethnicity. This study aims to evaluate the effects of ethnicity on findings in prenatal and perinatal periods among Turkish-born and Syrian-born women living in Adıyaman.

Material and Method: This retrospective study evaluated the laboratory data of 600 pregnant women. Pregnant women were divided into the Syrian-born group (n =300; mean age±SD: 30.38±6.38 years) and the Turkish-born group (n =300; mean age±SD: 29.84±6.07 years). Demographic data, obstetric history, clinical findings, neonatal and obstetric outcomes were compared between groups. In addition, women's hemoglobin, TSH, Vitamin D, and Vitamin B12 results were evaluated.

Results: There were significant differences between Turkish and Syrian women regarding preeclampsia, intrauterine growth retardation (IUGR), and screening test rate. Preeclampsia was higher in Turkish women compared to Syrian women (p =0.002). IUGR and lack of screening tests were more common in Syrian women compared to Turkish women (p <0.001, p <0.001, respectively). In addition, the vitamin D level was significantly lower in Syrian women than in Turkish women (p <0.001). Then, the groups were evaluated according to their vitamin D levels by dividing them into deficiency, insufficiency and normal. While vitamin D deficiency was more common among Syrian women than Turkish women, Turkish women had normal and insufficient vitamin D levels compared to Syrian women (p <0.001).

Conclusion: To the best of our knowledge, this is the first study comparing Syrian and Turkish pregnant women in Adıyaman According to our findings, it was seen that Syrian pregnant women had lower screening test rate, lower vitamin D levels and higher IUGR than Turkish pregnant women.

Keywords: *Maternal Health, Pregnancy Outcomes, Ethnicity, Syrian-Born, Turkish-Born.*

ÖZ

Suriye ve Türkiye Doğumlu Gebelerin Prenatal ve Perinatal Sonuçlarının Değerlendirilmesi, Tersiyer bir Merkez Sonuçları

Amaç: Prenatal ve perinatal dönemde kadın ve bebek sağlığını etkileyen faktörler etnik kökene göre farklılık gösterebilir. Bu nedenle Adıyaman'da yaşayan Türkiye ve Suriye doğumlu kadınlarda doğum öncesi ve perinatal dönemdeki bulgulara etnik kökenin etkisini değerlendirmeyi amaçladık.

Gereç ve Yöntem: Retrospektif olan bu çalışmada 600 hamile kadının laboratuvar verileri değerlendirildi. Gebeler Suriye doğumlular (n =300; ort. yaş±SS: 30.38±6.38 yıl) ve Türkiye doğumlular (n =300; ort. yaş±SS: 29.84±6.07 yıl) olarak ikiye ayrıldı. Gruplar arasında demografik veriler, obstetrik öykü, klinik bulgular, obstetrik ve neonatal sonuçlar karşılaştırıldı. Ayrıca kadınların hemoglobin, TSH, Vitamin D ve Vitamin B12 sonuçları değerlendirildi.

Bulgular: Preeklampsi, intrauterin gelişme geriliği (IUGR) ve tarama testi oranı açısından Türk ve Suriyeli kadınlar arasında anlamlı fark vardı. Preeklampsi, Türk kadınlarında Suriyeli kadınlara göre daha yüksekti (p =0,002). IUGR ve tarama testi eksikliği Suriyeli kadınlarda Türk kadınlara göre daha yaygındı (sırasıyla, p <0.001, p <0.001). D vitamini düzeyi Suriyeli kadınlarda Türk kadınlarına göre anlamlı derecede düşüktü (p <0.001). Daha sonra gruplar vitamin D düzeylerine göre eksiklik, yetersizlik ve normal olarak ayrılarak değerlendirildi. D vitamini eksikliği Suriyeli kadınlarda Türk kadınlarına göre daha yaygın iken, Türk kadınlarında Suriyeli kadınlara göre vitamin D düzeyi normal ve yetersizdi (p <0.001).

Sonuç: Bildiğimiz kadarıyla bu araştırma, Adıyaman'da Suriyeli ve Türk gebeleri karşılaştıran ilk çalışmadır. Bulgularımıza göre, Suriyeli gebelerin Türk gebelere göre daha düşük tarama testi oranı, daha düşük D vitamini seviyeleri ve daha yüksek IUGR'ye sahip olduğu görüldü.

Anahtar Sözcükler: *Anne Sağlığı, Gebelik Sonuçları, Etnik Köken, Suriye, Türk.*

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Women of reproductive age may encounter many negative situations, such as unhealthy abortions, sexually transmitted infections, preterm birth, postpartum complications, and maternal death. These situations vary with factors like race, ethnicity, and educational status.

While optimal fetal growth is considered a fundamental basis for long-term health, abnormalities in growth can have implications for lifelong disease risk. Abnormal fetal growth, restriction, and overgrowth are associated with fetal, infant, and child mortality and morbidity. It also has implications for reproductive disorders and subsequent chronic diseases (1, 2). For example, girls born small for gestational age have been reported to

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have earlier onset and progression of puberty and a higher incidence of disease during pregnancy than unaffected girls; this indicates restricted fetal growth (3). Adverse birth outcomes, such as preterm births and low birth weight births, are common causes of infant death in the United States (4). Over the past 20 years, studies have shown a higher incidence of gestational diabetes, preeclampsia and pregnancy-induced hypertension, preterm birth, and stillbirth in non-Hispanic Black and Hispanic women (5). Peripartum hysterectomy, which is one of the important postnatal complications, may differ according to the type of birth, but may also differ according to ethnicity (6, 7).

Due to its geographical and strategic location, our country has been the final stop of all kinds of regular, irregular, and mass migration movements throughout history and has had to host millions of immigrants. Today, as a bridge between Middle Eastern and Asian, and European countries, it has become a route/corridor where migration passes are mostly experienced (8). Turkey is home to the largest number of registered Syrian refugees due to the ease of transportation**.** Due to trauma, Syrian refugees are physically and/or psychologically in a disadvantaged and vulnerable group. Racial and ethnic inequalities in maternal health are a potential issue to become a national public health crisis (9).

This study aims to evaluate ethnicity's effect on findings in prenatal and perinatal periods among Turkish-born and Syrian-born women living in Adıyaman.

MATERIAL AND METHOD

Study Population

In this retrospective study, the laboratory data of 600 pregnant women who were followed up at Adıyaman University, Faculty of Medicine, Department of Obstetrics and Gynecology, were evaluated between January 2020 and March 2022. Pregnant women were divided into the Turkish-born group (n =300; mean age±SD= 29.84±6.07 years) and the Syrian-born group (n =300; mean age±SD= 30.38±6.38 years). We evaluated features including age, number of pregnancies, baby weight, stillbirth, type of delivery, baby gender, preterm birth, preeclampsia, eclampsia, intra uterine growth retardation (IUGR), gestational diabetes mellitus (GDM), congenital anomaly, and screening test rate. In addition, women's hemoglobin, Vitamin B12, TSH, and Vitamin D values were evaluated. We evaluated hemoglobin<11gr/dL values as anemia. Serum 25(OH)D less than 12 ng/mL indicates deficiency, serum 25(OH)D 12-20 ng/mL indicates insufficiency, and serum 25(OH)D greater than 20 ng/mL is considered normal.

After approval from the same hospital's Institutional Ethics Board, we used the hospital's electronic database, which contains multiple data fields on variables for pregnancy. The principles outlined in the Declaration of Helsinki were followed. The Hospital's Local Ethics Committee of Human Research approved the study (Approval number:2021/08-29).

Statistical Analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences program (IBM SPSS, version 20) and the OpenEpi Info software version 3.01 (www.openepi.com). The Shapiro-Wilk test was performed to check the normality. Moreover, the nonparametric tests were performed given the non-normality of the groups before the statistical analyses. The relationship between the groups was studied using the Chi-square test to check the variables. Finally, the Mann-Whitney test was performed to investigate the difference between the two groups in all continuous variables. A value of $p < 0.05$ was accepted as statistically significant.

For calculating the sample size with the GPower 3.1 (http://www.gpower.hhu.de/) program, two groups' total mean was measured based on the Mann-Whitney test with the power of 99%, effect size of 45%, and 0.01 type 1 error for at least 502 patients.

RESULTS

Records of 600 pregnant women (300 Turkish, 300 Syrian) were evaluated in this study. The baseline demographic and clinical findings of pregnant women are shown in table 1.

Table 1. *Demographical and clinical characteristics of groups.*

Characteristics	Turkish women n =300 (%) median (range) mean ± SD or n(%)	Syrian women n =300 (%) median (range) mean ± SD or n(%)	p
Age (years)	28.42(18.42-48.24) 29.84±6.07	29.42(18.42-53.77) 30.38±6.38	0.273**
Age >35	64 (21.3)	78 (26.0)	0.212*
Gravida	3.25±2.18	3.03±2.22	0.102**
Baby weight (gr)	3100(460-4600) 3033.16±627	3100(880-4750) 3027.65±537	0.596**
Stillbirth	5 (1.6)	6 (2)	0.761*
Type of birth			
CS	85 (28.3)	103 (34.3)	0.134*
Vaginal	215(71.7)	197(65.7)	
Baby gender			
Girl	145 (48.4)	146 (48.6)	0.935*
Boy	155 (51.6)	154 (51.4)	
Preterm birth	21 (7)	32 (10.7)	0.114*
Preeklampsia	45 (15)	21 (7)	**0.002***
Anemia	39 (13.0)	31 (10.3)	0.373*
Eclampsia	3 (1.0)	4 (1.3)	0.704*
IUGR	14 (4.7)	42 (14)	**<0.001***
GDM	9 (3)	5 (1.7)	0.279*
Congenital anomaly	4 (1.4)	8 (2.7)	0.243*
Screening test ratio (double-triple)	124 (41.4)	61 (20.4)	**<0.001***

*CS: Cesarean/section, IUGR: intrauterine growth retardation; GDM: gestational diabetes mellitus; * Chi-square test; ** Mann-Whitney test.*

The mean age for Syrian-born women was 30±6.38 years and 29.84±6.07 years for the Turkish-born women, which was not statistically different. In addition, the groups were similar in age >35, gravida, baby weight, stillbirth, type of birth, baby gender, preterm birth, anemia, eclampsia, GDM, and congenital anomaly (p >0.05).

There was a significant difference between Turkish and Syrian women in terms of preeclampsia, IUGR, and screening test ratio. Preeclampsia was higher in Turkish women compared to Syrian women (p=0.002). IUGR and lack of screening tests were more common in Syrian women compared to Turkish women (p <0.001, p <0.001, respectively).

We evaluated the two groups' hemoglobin, Vitamin B12, TSH, and Vitamin D levels. Hemoglobin, Vitamin B12, TSH values were also similar between the Syrian and Turkish patients (12.22±1.01g/dL vs 12.19±1.07 g/dL; 256.77±98.01 pg/mL vs 258.36±105.36 pg/mL; 2.08±1.88 mIU/L vs 1.95±1.73 mIU/L respectively; p >0.05). Vitamin D levels were significantly lower in Syrian-born women than in Turkish-born women (p <0.001) (Table 2).

Table 2. *TSH, Vitamin D, Vitamin B12 and Hemoglobin levels in groups.*

	Turkish women median (range) mean ± SD	Syrian women median (range) mean ± SD	p
TSH (mIU/L)	1.65(0-23.20) 1.95±1.73	1.71(0-23.20) 2.08±1.88	0.460*
Vitamin D (ng/mL)	15.90(5.10-48) 17.85±6.94	12.50(0.90-48) 13.21±6.60	**<0.001***
Vitamin B12 (pg/mL)	240(11.60-631) 258.36±105.36	247(11.60-617) 256.77±98.01	0.869*
Hemoglobin (g/dL)	12.30(8.70-14) 12.19±1.07	12.40(9-14) 12.22 ±1.01	0.904*

**Mann-Whitney test.*

Afterward, the groups were evaluated according to Vitamin D levels by dividing them into deficiency, insufficiency, and normal. Results are presented in table 3.

Table 3. *Vitamin D levels in groups.*

Vitamin D levels	Turkish women n =300 (%)	Syrian women n =300 (%)	p
Deficiency (<12 ng/mL)	48 (16)	137 (45.7)	**<0.001***
Insufficiency (12-20 ng/mL)	164 (54.6)	122 (40.6)	
Normal (20-50 ng/mL)	88 (29.4)	41 (13.7)	

**Chi-square test.*

Vitamin D deficiency was more common in Syrian women than in Turkish women (p <0.001). The average and insufficient Vitamin D levels were higher in Turkish women than in Syrian women (p <0.001).

DISCUSSION

The factors that cause differences in maternal and infant health are complex and multifactorial. Most studies on racial and ethnic disparities in prenatal care among pregnant women have investigated a limited number of measures, primarily the initiation and frequency of antenatal care visits. In the majority of these studies, only differences between white and black women were investigated. Some studies have proposed that several factors may contribute to racial and ethnic disparities in pregnant women, like socioeconomic disadvantages, maternal stress, perceived racism, smoking, alcohol consumption, and substance abuse. These can lead to birth outcomes such as maternal morbidity (10). The intersection of race, gender, poverty, and other social factors shape the individuals' experiences and outcomes, particularly in maternal and infant health (11).

Pregnant women living in war zones may face adverse pregnancy outcomes such as preterm birth, low birth

weight, increased fetal death, and increased obstetric complications (12). With the civil war that started in Syria, most people had to leave their country. Migration, which initially began in small groups, gradually turned into large migration movements. Adıyaman most of which is located in the Southeastern Anatolia Region, is a province where Syrian immigrants predominantly reside. According to the data of the Refugees Association, the number of Syrians living in Adıyaman as of 26 May 2022 is 23286 (https://multeciler.org.tr/turkiyedeki-suriyeli-sayisi/).

But the actual number is assumed to be above this. Syrian patients have free access to migrant health centers and all hospitals. Syrian pregnant women can benefit from all pregnancy health services free of charge in Turkey. In addition, they can benefit from translation services in migrant health centers and hospitals (13). The only hospital in the city Syrians can visit is our hospital. Ozel et al. (14) reported that only 23% of pregnant Syrian refugees received prenatal care in Ankara in 2015. Previous studies showed that Syrian migrant pregnant women had low antenatal care, lower gestational age, and higher adolescent pregnant women compared to the control group (15, 16).

In this study, we intended to compare the demographic and clinical characteristics of Turkish and Syrian pregnant women living in Adıyaman and we evaluated 300 Syrian and 300 Turkish pregnant women. Our results showed a significant difference between the groups regarding some values. In previous works, it has been demonstrated that Syrian refugees who were pregnant were younger than Turkish women who were pregnant (17, 18). However, in this study, no difference is found between the age of Turkish and Syrian women (Table 1). Furthermore, there is no difference between the two groups regarding pregnancy over the age of 35. Immigrants have been in Turkey since 2012, and this may be because the Syrian patients who come to hospitals over the years are not as young as they first arrived.

Some studies have reported higher cesarean delivery rates in Turkish women than in Syrian women (18-20). On the other hand, in this work, it is shown that there is no statistically significant difference between the groups regarding birth type. Kıyak et al. (18) and Gungor et al. (19) reported that there was no difference in the two groups' rates of stillbirth or fetal anomalies between the Turkish and Syrian pregnant groups. We also have found the same results in terms of stillbirth and fetal anomalies. Moreover, no difference has been observed between Turkish and Syrian pregnant women in terms of age >35, gravida, baby weight, type of birth, baby gender, preterm birth, anemia, eclampsia, and GDM.

Canturk et al. (20) reported that hemoglobin values were lower in the Syrian group compared to Turks. In our study, hemoglobin values are similar in both groups. It has been found that preeclampsia is more common in Turkish women compared to Syrian women. This is consistent with data from Kıyak et al. (18) and Demirci et al. (21). Thus, it can be explained that Turkish pregnant women are less followed in a tertiary center in antenatal care. While access to a tertiary center is not limited, we think most Turkish pregnant women have a prenatal follow-up in primary health care centers due to easy access. The fact that Syrian patients in our country are not yet directly affiliated with family medicine and can go to any hospital they want may be an adequate reason for this. The genetic background of preeclampsia may also be one of the factors. IUGR and screening test rate were lower in Syrian women than in Turkish women (Table 1). We think that IUGR may be caused by the reasons such as malnutrition and lack of follow-up. The lack of screening tests may be due to the lack of regular follow-ups. The low rate of screening tests may also be due to the belief that the child is willing to give birth regardless of whether the child is sick or not.

We have evaluated hemoglobin, Vitamin B12, TSH, and Vitamin D levels and routinely checked all pregnant women. Although hemoglobin, Vitamin B12, and TSH values were similar, Vitamin D levels were significantly lower in Syrian women compared to Turkish women (Table 2). Vitamin D deficiency and insufficiency are common all over the world. Epidemiological studies show that vitamin D deficiency is common in women, including prenatal and lactating mothers (22). It has been shown that low vitamin D is associated with adverse maternal conditions such as gestational diabetes mellitus (23), pregnancy-related hypertension (24), recurrent pregnancy losses (25), high blood pressure in diabetic pregnancy (26), and postpartum depression (27). Pregnant women with Vitamin D levels below 12 ng/mL were statistically higher in Syrian women (45.7% vs. 16%). It may be related to women's lack of control and dressing style. Vitamin D insufficiency and normal levels were higher in Turkish women than in Syrian women (Table 3).

Some limitations existed in this study. Firstly, our study samples were relatively small and this was a retrospective study. Thus, more extensive community-based studies are needed. The second limitation is that our data only reflects the population living in one region. Consequently, it might not represent the entire Turkish community. The other is that only pregnant women who applied to our hospital were selected. Thus, although it is considered that the number of pregnant women followed in different centers in the city is low, these data could not be reached. On the other hand, accessing many parameters from the hospital data system is a great advantage in terms of accuracy.

Conclusion

This is, as far as we are aware, the first study in Adıyaman to compare pregnant women from Syria and Turkey. According to our data, Syrian pregnant women have lower screening test rates, lower vitamin D levels, and higher IUGR levels than Turkish pregnant women. In developing nations, giving women adequate opportunities could potentially reduce unfavorable pregnancy outcomes.

Ethics Approval: Ethics committee approval was obtained from Adıyaman University (Ethic committee no: 2021/08-29/ 26.10.2021).
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Conflict of Interest Statement: There is no conflict of interest.
Author Contribution: The planning, data collection, analysis, and writing stages of the study were carried out by MCN and PK.

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