



Placenta Accreta Spectrum Management and Outcomes: A Comparative Analysis of Syrian Refugees and Turkish Citizens Giving Birth in a Tertiary Hospital

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Abstract

Aim: Placenta accreta spectrum disorders (PAS) are a global threat to maternal well-being. The aim of this study was to assess differences in clinical characteristics and maternal outcomes between Turkish natives and Syrian refugees giving birth with a diagnosis of PAS at a tertiary centre, and to experience the management of this condition in the unique context of Türkiye, home to one of the world's largest refugee populations.

Material and Method: A retrospective study was conducted using the medical records of 228 singleton pregnancies at high risk of PAS, between January 2019 and October 2022. PAS risk assessment was initially performed by ultrasound at mid-trimester, with diagnosis confirmed histologically or clinically, indicating the presence of placental retention following attempted manual removal. The study population was divided into two groups: native and refugee. We investigated disparities in demographic and medical characteristics and primary maternal and neonatal outcomes.

Results: The study found an increased prevalence of previous cesarean delivery ($p=0.005$), anterior placenta ($p<0.000$), placenta previa ($p=0.047$), and deeper placental invasion (increta/percreta) ($p<0.000$) in the native group ($n=161$). The native group had a significantly higher rate of estimated blood loss (2093.5 ± 1516.4 mL vs. 714.1 ± 731.6 mL, $p<0.000$) and peripartum hysterectomy ($p=0.005$) compared to the refugee group ($n=67$). The refugee group had a notably higher incidence of delayed diagnosis ($p<0.000$) and a shorter surgery duration ($p=0.027$) compared to the native group.

Conclusion: The current study highlights significant differences in patient characteristics and outcomes between native and refugee pregnant women with PAS. Despite facing challenges, these women did not encounter adverse perinatal outcomes, indicating the efficacy of healthcare interventions.

Keywords: Disparities, placenta accreta spectrum, Syrian refugees, Turkish natives

INTRODUCTION

Placenta accreta spectrum (PAS) is a histopathological term for the abnormal attachment of all or part of the placenta to the myometrium of the underlying uterine wall (1). This condition is mainly defined by the lack of decidua, leading to the direct attachment of chorionic villi to the myometrial fibers. It is divided into three categories: placenta accreta, placenta increta and placenta percreta, based on the depth of myometrial invasion by the placental villi (2).

In recent decades, the incidence of PAS has been increasing (3,4), closely linked to the global rise in cesarean delivery rates (5). This trend is similarly observed in Türkiye, where the cesarean delivery rate has steadily climbed from 7% in

1993 to 52% in 2018 (6,7). Placenta previa, previous uterine surgery, in vitro fertilization (IVF) and advanced maternal age are other recognised risk factors (8-10).

PAS presents a significant global health challenge due to its association with increased maternal morbidity and mortality. About 60% of affected pregnancies experience severe bleeding, with a mortality rate of up to 7% (11). This often necessitates cesarean hysterectomy and can potentially result in organ damage, sepsis, and disseminated intravascular coagulation (12,13). Prenatal diagnosis plays a crucial role in initiating appropriate management, allowing multidisciplinary planning, and facilitating referral to specialized centers, all of which contribute to a reduction in the risk of maternal mortality and morbidity (14).

CITATION

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Migration has emerged as an unprecedented global phenomenon, becoming an integral facet of life in numerous societies. The management and outcomes of PAS present unique challenges in populations with diverse sociodemographic backgrounds (15). These challenges may be particularly pronounced in the case of refugees, where barriers such as limited access to healthcare services, language differences, cultural distinctions, and socioeconomic factors are often prevalent. In such cases, there may be additional challenges in the early diagnosis of PAS, which is crucial. These difficulties may also be common in the Syrian refugee population living in Türkiye, but it is not possible to definitively determine this because of the limited data available. Therefore, the objective of this study was to assess the incidence, management, and outcomes of PAS among Syrian refugees and Turkish natives.

MATERIAL AND METHOD

A retrospective study was conducted using the medical records of 228 patients with singleton pregnancies at high risk of PAS, who were delivered in the perinatology department of a state tertiary hospital between January 2019 and October 2022.

The study protocol was approved by the Ethics Committee of the University of Health Sciences Etlik Zübeyde Women's Gynecology Training and Research Hospital (2021/99). PAS was primarily diagnosed by mid-trimester ultrasound by a fetal medicine specialist. This involved evaluating sonographic markers using grayscale and color Doppler imaging, as well as adhering to a standardized reporting protocol for sonographic findings. This protocol includes criteria such as loss of the hypoechoic retroplacental clear zone, abnormal placental lacunae, or myometrial thinning as outlined by the European Working Group on Abnormally Invasive Placenta (EW-AIP) (16). Furthermore, the severity of PAS (placenta accreta, placenta increta, and placenta percreta) at delivery was evaluated using the International Federation of Gynaecology and Obstetrics (FIGO) clinical grading system (17) and the International Society of Abnormally Invasive Placenta (IS-AIP) guideline (18). Surgical strategy was standardised, with all patients receiving pre-delivery counselling regarding the need for focal excision or cesarean hysterectomy in cases with evidence of abnormal placental adhesion, regardless of attempts to control bleeding with uterotonics, mechanical intervention or surgical methods. Based on the expected severity of PAS and to optimize perinatal outcomes, patients with PAS were planned for cesarean delivery between 34 and 37 weeks' gestation. Emergency cesarean delivery was performed before 34 weeks' gestation if the patient had severe vaginal bleeding, premature rupture of membranes, or signs of preterm labor indicated by uterine contractions.

Data extracted from hospital medical records included maternal demographic and medical characteristics such as gravidity, parity, history of uterine surgery, number of previous cesarean deliveries, placental location (anterior

or posterior), presence of placenta previa (defined as complete or marginal <2 cm from the cervix) and severity of PAS. Maternal outcomes encompassed factors such as duration of surgery, estimated blood loss (assessed by examination of blood in the aspirator container and sponges), transfusion of blood products, and any surgical or non-surgical interventions performed during delivery. Neonatal outcomes included variables such as gestational age, birth weight, 5-minute Apgar score, and neonatal intensive care unit (NICU) admission.

The analysis was conducted utilizing the Statistical Package, version 28.0 (IBM Corporation, Armonk, New York, USA). The study used mean±(standard deviation) or median±(minimum-maximum) to describe numerical data. Furthermore, parametric variables were analyzed using the Student's t-test, while nonparametric variables were assessed using the Mann-Whitney U test. The chi-square test was employed to evaluate associations among categorical variables, with statistical significance set at a p-value<0.05.

RESULTS

From January 2019 to October 2022, a total of 228 pregnant women diagnosed with PAS were included in the study. The study population consisted of two groups: refugees (n=67, 29.4%) and natives (n=161, 70.6%), all of whom underwent cesarean delivery.

The results of the demographic and medical characteristics that were measured are shown in Table 1. Both groups showed similarity in terms of prior uterine surgery and IVF. The native group had a higher BMI and smoking rate (p<0.000 and p=0.017, respectively), whereas the refugee group had a lower age and higher parity rate, with a significant difference (p<0.000). The native group had significantly higher rates of previous cesarean delivery (p<0.000), placenta previa (p=0.047) and deeper placental invasion (increta/percreta) (36.7% vs. 7.5%, p<0.000). Regarding placental location, the refugee group had a higher rate of posterior placentation (69% vs. 45%, p<0.000) and intrapartum diagnosis (31.3% vs. 8.7%, p<0.000) compared to the native group.

The maternal outcomes are shown in Table 2. The duration of surgery was longer in refugee group (158.3±41.4 min vs. 142.8±32.6 min, p=0.027). The estimated blood loss (2093.5±1516.4 mL vs. 714.1±731.6 mL, p<0.000) and the rate of peripartum hysterectomy were higher in native group (73.2% vs. 47.7%, p=0.005). However, conservative management techniques such as intrauterine balloon tamponade replacement (34.3% vs. 11.2%, p=0.001) and compression sutures (37.3% vs. 11.9%, p=0.001) were used more frequently in the refugee group.

Neonatal outcomes are shown in Table 3. There were no significant differences observed in the 5-minute Apgar scores between the groups. The refugees group had a higher gestational age (35.5±2.2 weeks vs. 34.6±3.2 weeks, p=0.032) and birth weight (2889±449.1 g vs. 2486±458.7 g, p<0.000).

| Table 1. Demographic and medical characteristics | | | | |
|--------------------------------------------------------|-----------|-----------------|-----------------|---------|
| Antepartum characteristics | Group | Native, (n=161) | Refugee, (n=67) | p-value |
| Maternal age (years), n (%) | <35 | 75 (46.6) | 54 (80.6) | <0.000 |
| | ≥35 | 86 (53.4) | 13 (19.4) | |
| Parity, n (%) | 1 | 14 (8.6) | 1(1.4) | <0.000 |
| | 2 | 44 (27.3) | 1(1.4) | |
| | 3 | 62 (38.5) | 5 (7.4) | |
| | ≥4 | 41(25.6) | 60 (89.8) | |
| Number of previous cesarean deliveries, n (%) | 0 | 19 (11.8) | 42 (62.6) | <0.000 |
| | 1 | 69 (42.8) | 10 (14.9) | |
| | 2 | 44 (27.3) | 4 (5.9) | |
| | ≥3 | 29 (18.1) | 11(16.6) | |
| Sex, n (%) | Female | 99 (61.4) | 53 (79.1) | 0.001 |
| | Male | 62 (38.6) | 14 (20.9) | |
| Smoking, n (%) | | 21 (13.1) | 2 (2.9) | 0.017 |
| Previous uterine surgery, n (%) | | 11 (6.9) | 6 (8.9) | 0.384 |
| Previous dilatation and curettage of the uterus, n (%) | | 16 (9.9) | 3 (4.5) | 0.148 |
| IVF pregnancy, n (%) | | 3 (1.9) | 5 (7.5) | 0.684 |
| BMI (kg/m ²), (median±sd) | | 30.97±5.21 | 24.4±4.4 | <0.000 |
| Delivery type, n (%) | Planned | 98 (60.8) | 27 (40.3) | <0.000 |
| | Urgency | 63 (39.2) | 40 (59.7) | |
| Placenta previa, n (%) | | 128 (79.6) | 45 (67.2) | 0.047 |
| Placenta accreta, n (%) | | 102 (63.4) | 62 (92.6) | <0.000 |
| Placenta (increata and percreata), n (%) | | 59 (36.7) | 5 (7.5) | <0.000 |
| Placental localization, n (%) | Anterior | 110 (69%) | 30 (45%) | <0.000 |
| | Posterior | 51 (31%) | 37 (55%) | |
| Intrapartum diagnosis | | 14 (8.7%) | 21 (31.3%) | <0.000 |
| Maternal age, (mean±sd) | | 36.2±5.3 | 33±5.6 | 0.042 |

BMI: body mass index, IVF: in vitro fertilization

| Table 2. Maternal outcomes | | | | |
|------------------------------------|------------------------------------------------|-----------------|-----------------|---------|
| Outcomes | | Native, (n=161) | Refugee, (n=67) | p-value |
| Operating time, minutes (mean±sd) | | 142.8±32.6 | 158.3±41.4 | 0.027 |
| Estimated blood loss, mL (mean±sd) | | 2093.5±1516.4 | 714.1±731.6 | <0.000 |
| Transfusion of blood products | The number of RBC units, (mean±sd) | 3.3±2.8 | 1.3±1.4 | <0.000 |
| | The number of FFP units, (mean±sd) | 2.2±2.5 | 1.2±2 | 0.032 |
| | The number of platelet units, (mean±sd) | 0.4±0.7 | 0.2±0.6 | 0.152 |
| | The number of cryoprecipitate units, (mean±sd) | 0.2±0.6 | 0.4±0.7 | 0.152 |
| Operative management | Cesarean hysterectomy, n (%) | 118 (73.2) | 32 (47.7) | 0.005 |
| | Intrauterine balloon tamponade, n (%) | 18 (11.2) | 23 (34.3) | 0.001 |
| | Internal iliac artery ligation, n (%) | 10 (6.2) | 4 (5.9) | 0.092 |
| | Uterine compression sutures | 19 (11.9) | 25 (37.3) | 0.001 |
| Major maternal morbidity | Bladder injury, n (%) | 25 (15.6) | 8 (11.9) | 0.335 |
| | Urinary tract injury, n (%) | 2 (1.3) | 7 (10.5) | 0.034 |
| | Vascular injury, n (%) | 8 (4.9) | 7 (10.5) | 0.072 |
| | The wound infection, n (%) | 6 (3.8) | 3 (4.5) | 0.685 |
| | Reoperation, n (%) | 5 (3.2) | 3 (4.5) | 0.838 |
| | Thromboemboly, n (%) | 4 (2.5) | 4 (5.9) | 0.551 |
| | Bowel injury, n (%) | 0 | 1 (1.5) | 0.167 |
| | Postop.hemorrhage, n (%) | 6 (3.8) | 2 (2.9) | 0.2450 |
| | Sepsis, n (%) | 0 | 1 (1.5) | 0.167 |
| | The intensive care unit admission, n (%) | 48 (29.9) | 16 (23.9) | 0.318 |

RBC: red blood cell, FFP: fresh frozen plasma

Table 3. Neonatal outcomes

| Outcomes | Native, (n=161) | Refugee, (n=67) | p-value |
|----------------------------------|-----------------|-----------------|---------|
| Gestational age, weeks (mean±sd) | 34.6±3.2 | 35.5±2.2 | 0.032 |
| Apgar score at 5 min, (mean±sd) | 7.4±0.9 | 7.6±0.7 | 0.159 |
| Birth weight,g (mean±sd) | 2486±458.7 | 2889±449.1 | <0.000 |
| NICU, n (%) | 61 (39.2) | 41 (61.2) | 0.004 |

NICU: neonatal intensive care unit

DISCUSSION

The Syrian refugee crisis has led to a large influx of refugees seeking safety and protection in neighboring countries such as Türkiye. Türkiye is home to the largest number of Syrian refugees worldwide, with 3,713,344 people officially registered, 18.2% of whom are women aged 18 and over (19). The growing number of refugees worldwide poses particular challenges to providing adequate healthcare, especially for pregnant women. Previous studies have extensively documented significant inequalities in maternal morbidity and mortality, highlighting the disproportionate impact on minority populations based on race and ethnicity (20-23). However, studies of health inequalities emphasize that the effects of race and ethnicity are due to social structures rather than biological or genetic differences (24-26). Understanding social determinants of health is crucial as they encompass the circumstances in which individuals are born, raised, reside, labor, and age. These factors also include socioeconomic status, education, employment, housing, and access to healthcare (27,28). This may be particularly evident in the context of Syrian refugees living in Türkiye, where language barriers, cultural differences and socioeconomic factors may lead to disparities in access to healthcare services (28).

Recent research has shown that a significant proportion of pregnant Syrian refugees receive inadequate antenatal care compared to the non-refugee population (29). However, the results of a study conducted in Lebanon are different, possibly because of the presence of Arabic as a spoken language, which facilitates communication for Arabic-speaking Syrian refugees. Interestingly, the same study found that antenatal follow-up rates among pregnant women in Syria before the war were significantly higher than those in Lebanon (29). This demonstrates the influential role of language while recognizing that other factors influence access to appropriate health services. These challenges may result in delayed or inadequate antenatal care, thereby limiting the early diagnosis and management of PAS. In Addition, multiple studies have consistently shown that planned delivery, in contrast to emergency delivery, is significantly associated with reduced blood transfusion requirements and improved neonatal outcomes in cases of PAS (30-33).

Natives are generally more familiar with the healthcare system and have better access to prenatal care, which may facilitate earlier diagnosis and appropriate management of PAS. Nevertheless, it was important to critically assess whether Turkish pregnant women with PAS were really more

fortunate than Syrian pregnant women because several known factors were associated with an increased risk of PAS in Turkish women. A meta-analysis examining the total number of cesarean deliveries among Syrian refugees in Türkiye revealed a significantly lower rate compared with the Turkish population (34). In particular, previous research has consistently identified a previous caesarean delivery as the most important risk factor for the development of PAS (35,36). Crucially, the incidence of PAS increases with the number of previous cesarean deliveries, from about 0.3% in women with one cesarean delivery to about 7% in those with more than five (35). This study found that the rate of cesarean section was significantly higher among Turkish pregnant women compared to Syrian pregnant women ($p<0.000$).

Placenta previa is another significant and independent risk factor for the development of PAS (36). Previous studies have consistently shown that when placenta previa with PAS is located in the anterior uterine wall, there's an increased risk of postpartum hemorrhage, often necessitating massive transfusions and potentially resulting in hysterectomy (37). The current study found a higher prevalence of specific risk factors for maternal morbidity among Turkish women, including higher incidence of anterior placenta ($p<0.000$), placenta previa ($p=0.047$) and peripartum hysterectomy ($p=0.005$) compared to Syrian women.

A previous study showed that placenta percreta was associated with increased maternal morbidity despite planned management and the application of additional measures, typically used in cases of PAS (37). This study found that Turkish women had higher incidence of deeper placental invasion (increta/percreta) ($p<0.000$) and estimated blood loss ($p<0.000$) during delivery. In line with Morgan's research (38), posterior placenta ($p<0.000$), delayed diagnosis ($p<0.000$) and the use of conservative management approaches (e.g., intrauterine balloon tamponade replacement, uterine compression sutures, and internal iliac artery ligation) ($p=0.001$) were found significantly more common among Syrian pregnant women, who also had lower rates of previous cesarean deliveries. Similar to our findings, previous research has suggested that PAS cases with a posterior placental position were less likely to present as increta or percreta, conditions associated with increased maternal morbidity (36-38). This is probably the main reason that the Syrian pregnant women in our study had better maternal and surgical outcomes than the Turkish pregnant women, despite lower rates of prenatal follow-up and delayed diagnosis.

While acknowledging the limitations of the retrospective study and the need for cautious interpretation of the results, it is important to highlight that the study represents the first investigation of obstetric data and outcomes among Syrian refugees with PAS in Türkiye. Despite the challenges they faced in accessing antenatal care and language problems, the refugee pregnant women in our study did not experience adverse perinatal outcomes.

CONCLUSION

Given the potentially life-threatening nature of PAS disorders, it is essential to further investigate the differences between local and refugee pregnant populations to optimize adverse maternal and neonatal outcomes.

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