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THE ASSOCIATION BETWEEN PLACENTA PREVIA AND PLACENTA INCRETA AND LEUKOCYTE AND PLATELET INDICES

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ABSTRACT

Aim: Despite medical advances, rising awareness, and satisfactory care facilities, placenta previa (PP) remains a challenging clinical entity due to the risk of excessive obstetric hemorrhage. Etiological concerns gave way to life-saving concerns about the prediction of maternal outcomes due to hemorrhage. The study aims to detect early predictive indicators of defective placenta previa and its associated adhesion abnormalities such as insertion using simple and available laboratory variables related to leukocytes and platelets in patients of Tishreen University Hospital to find a scanning test through which the risk of ablation and insertion can be predicted. **Materials and Methods:** Forty pregnant patients diagnosed with PP and 50 controls were recruited for this case report study. Platelet and leukocyte indices were compared between the two groups. **Results:** The groups were similar with regard to age distribution (31.56±4.9 years [mean ± SD] in the PP group and 29.08±5.6 years in controls), body mass index (BMI) (64.25±5.3 kg/m2 in the PP group and 61.49±7.3 kg/m2 in controls), and most characteristics of the obstetric history. Total leukocyte count, neutrophil count, and neutrophil-to-lymphocyte ratio were significantly higher in the PP group. Mean platelet volume (MPV) and large platelet cell ratio (P-LCR) values were significantly lower in the PP group as compared to controls, with regard to third trimester values. However, patients who were diagnosed postnatal with placenta percreta had lower MPV and P-LCR values than other patients with PP. There were no statistically significant differences between the two groups as far as first trimester values were concerned. **Conclusion:** Platelet and leukocyte indices in the third trimester of pregnancy may be valuable predictors of placenta previa and placenta percreta. More comprehensive studies are needed to address this issue.

KEYWORDS: leukocyte indices, placenta percreta, placenta previa, platelet indices, Prediction.

INTRODUCTION

Placenta previa (PP), defined as a placenta located on the internal os of the uterine cervix, may be the most dangerous cause of excessive obstetric haemorrhage and life-threatening clinical entity. It sometimes has a storming effect during the delivery as the result of unanticipated catastrophic complications, e.g. excessive hemorrhage, the need for cesarean hysterectomy, or surgical complications (laceration of the urinary bladder, intestinal or vascular trauma).

The diagnosis may be delayed due to the fact that PP may cause some mild complications which neither bother the patient nor alarm the clinician until the delivery, except for insignificant intermittent haemorrhage periods.[1]

As the time of delivery approaches, questions about the prediction of adhesive placental abnormalities and possible blood loss begin to appear. Ultrasonography and magnetic resonance imaging (MRI) have been proven to be useful in predicting and lessening the complications of placenta previa but, as most screening methods, they are not without pitfalls either.[2]

MATERIALS AND METHODS

It included pregnant women in the gynecology department at Tishreen University Hospital, in Lattakia-Syria for one year(2023-2024). in the period from April2023 until April 2024 for those who met the admission criteria.

The women in the synthesized study sample of 90 patients were divided as follows:

1. The first group included 40 women-The group of cases: women diagnosed with a defective placental previa of one of its degrees and meet the conditions for admission and exclusion.

2. The second group included 50 women – The control group: includes normal pregnant women without complications with normal placental abruption who went to the hospital for a routine visit.

Design. This study is a case-control study

The diagnoses and laboratory results were obtained from patient medical records. The diagnosis of PP was made if the lower edge of placental tissue was within 20 mm of the internal cervical os, or it overlapped it on transvaginal ultrasonographic examination. Placenta percreta was diagnosed when the placenta has invaded the myometrium and the perimetrium. The final pathologic diagnosis of placenta percreta was confirmed after delivery for every subject. The inclusion criteria were as follows: history of one cesarean section, singleton pregnancy with live fetus > 26 weeks of gestation (gestational age was determined from the date of the last menstrual period and confirmed by means of ultrasound in the first trimester). Exclusion criteria were as follows: twin gestation, infectious or hemorrhagic problems in the current pregnancy, neonate with congenital anomaly, systemic diseases (e.g. hypertensive, diabetic, cardiovascular, renal, thyroidal diseases, infectious diseases, diseases interfering with leukocyte counts and functions), patients who had been using various drugs (painkillers, alcohol, cocaine), and smoking. In the end, 40 patients diagnosed with placenta previa (study group) and 50 pregnant patients (control group) were included in the study after the exclusion criteria had been applied. Local Ethics Committee approved of the study.

All blood analyses were performed within two hours of blood sampling. Neutrophil-to-lymphocyte ratio (NLR) was calculated by proportioning absolute neutrophil count to absolute lymphocyte count. Likewise, platelet-to-lymphocyte ratio (PLR) was calculated as the ratio between the absolute platelet count and absolute lymphocyte count.

Study design
It was case-control study.

RESULTS AND DISCUSSION
The groups were similar with regard to age distribution (31.56±4.9 years [mean ± SD] in the PP group and 29.08±5.6 years in controls), body mass index (BMI) (64.25±5.3 kg/m2 in the PP group and 61.49±7.3 kg/m2 in controls), and most characteristics of the obstetric history (Table 1). Total leukocyte count, neutrophil count, and neutrophil-to-lymphocyte ratio were significantly higher in the PP group. Mean platelet volume (MPV) and large platelet cell ratio (P-LCR) values were significantly lower in the PP group as compared to controls, with regard to third trimester values. However, patients who were diagnosed postnatally with placenta percreta had lower MPV and P-LCR values than other patients with PP. There were no statistically significant differences between the two groups as far as first trimester values were concerned.

All study participants underwent a caesarean section. Gestational age at birth (37.44±1.6 weeks in the PP group and 38.56±0.9 weeks in controls).

Total leukocyte counts, neutrophil counts and neutrophil-to-lymphocyte ratios (NLRs) in the third trimester were significantly higher in the PP group as compared to controls ($p = 0.003$, $p = 0.01$ and $p = 0.001$, respectively) (Table 2,3,4). Mean platelet volume (MPV) and the 'ratio of large platelets' (P-LCR) values in the third trimester were significantly lower in the PP group as compared to controls ($p = 0.0001$ and $p = 0.0001$ respectively). There were no differences between groups in terms of lymphocyte counts, platelet counts, 'plateletcrit' (PCT) and 'platelet distribution width' (PDW) values in the third trimester and all of the investigated parameters in the first trimester.

Six out of 40 patients underwent hysterectomy because of adhesive placental abnormalities and all of the 6 patients were diagnosed with total placenta previa. The final pathologic diagnosis of placenta percreta was confirmed after delivery for every subject. None of them experienced any peri-operative or post-operative complications. The first trimester whole blood count of these 6 patients could not be obtained from the medical records, so analyses for their hematologic variables were performed with their third trimester values.

Similarity of demographic features such as age, BMI, and most obstetric history characteristics between the PP group and the control group increased the reliability and validity of the comparison. Previous curettage and abortion are widely known risk factors for the development of PP and our findings also confirmed that fact.[1,3] Birth weight and gestational age at birth in the PP group were significantly lower as compared to controls. We attributed these results to the complicated pregnancies, especially hemorrhagic consequences which demand early delivery. Regardless, no neonatal deaths were noted. It may have been due to low-risk study samples, because we excluded patients with systemic diseases, history of two or more cesarean deliveries, prior infectious or hemorrhagic problems in the current pregnancy and other risk factors in order to provide an equal evaluation between the two groups at the very beginning of the study. Considerable diversity of the hematologic parameters between the first and the third trimester made us think that pregnancy is a continuously changing process in itself. It was said that the reason for the increased leukocytosis was still unclear, but it might have been caused by the elevated estrogen and cortisol levels. In our study, platelet (PLT) counts of all patients in the first trimester were significantly higher than in the third trimester, which is again consistent with the literature. In our study, MPV and P-LCR values of all patients in the third trimester were significantly higher

than in the first trimester. Diminution of platelet counts and simultaneous enhancement of their volume and distribution width over the third trimester might be caused by their destruction, regarding microangiopathic reasons, even in a normal pregnancy.

Total leukocyte count, neutrophil count, neutrophil-to-lymphocyte ratio (NLR), MPV and P-LCR values in the third trimester were good predictors for the diagnosis of PP in our study. Other parameters like lymphocyte count, platelet count, PCT, and PDW values in the third trimester and all of the investigated hematologic parameters in the first trimester did not predict placenta previa. Neutrophil dominance in the PP group prompted us to think that an inflammatory process may take place in the third trimester because of PP. It could be caused by an ascending intrauterine and placental infection because of close proximity to the cervico-vaginal microbial colonization. Interestingly, there was no important difference between patients with placenta percreta and patients with non-percreta placenta previa regarding neutrophil dominance in our study. Considering similar close proximity of the placenta to the uterine cervix in hese two groups, we can advocate the accuracy of the idea put forward by Park et al.[9] However, we excluded patients with positive cervical culture result at the beginning of the study. Perhaps inflammatory processes in cervical tissue of the patients with placenta previa were non-infectious or infectious without bacterial colonization.

CONCLUSION

MPV and P-LCR values were found to be significantly lower in patients with placenta percreta than in patients with placenta previa non-percreta, and also were significantly decreased in all PP patients as compared to controls. These two parameters seem promising in distinguishing patients with adhesive placental complications from patients who have non-complicated placenta previa. Physio-pathologic mechanisms regarding these variabilities remain to be fully elucidated.

Table (1): Demographic variables Table 1. Comparisons of some demographic and descriptive characteristics between two groups.

Demographic variables	The research sample		P-value
	Placenta Previa (n=40)	Control (N=50)	
(year)Maternal age	52.2±6.5	50.9±7.1	0.4
(m^2/kg)BMI	26.3±1.9	25.5±1.7	0.1
Number of births	**3.15±1.8**	2.85±1.3	0.8
Abortus	**1.83±1.1**	**1.56±1.3**	**0.3**
D & C	**0.69±0.2**	**0.71±0.6**	**0.5**
Gestational ages at birth (weeks)	**37.44±1.6**	**38.56±0.9**	**0.08**

Table(2):

WBC	Control (n=50)	Placenta Percreta(n=15)	Non-percreta Placenta Previa (n=25)	P-value
	9544.21±2111.2	**10389.1±2459.7**	**10185.9±2059.1**	**0.003**

Table (3):

L	Control (n=50)	Placenta Percreta (n=15)	Non-percreta Placenta Previa (n=25)	P-value
	1534.8±421.8	**1572.6±432.1**	**1538.9±422.6**	**0.8**

Table (4):

N	Control (n=50)	Placenta Percreta (n=15)	Non-percreta Placenta Previa (n=25)	P-value
	6890.9±1725.3	**7547.2±2130.4**	**6995.8±1722.3**	**0.01**

Table (5):

NLR	Control (n=50)	Placenta Percreta (n=15)	Non-percreta Placenta Previa (n=25)	P-value
	3.59±1.9	4.79±2.5	4.39±2.1	0.0001

Table (6):

PDW	Control (n=50)	Placenta Percreta (n=15)	Non-percreta Placenta Previa (n=25)	P-value
	12.86±2.8	10.58±1.9	11.78±1.9	0.0001

Table (7):

MPV	Control (n=50)	Placenta Percreta (n=15)	Non-percreta Placenta Previa(n=25)	P-value
	10.63±2.2	8.73±0.9	9.82±1.6	0.0001

Table (8):

P-LCR	Control (n=50)	Placenta Percreta (n=15)	Non-percreta Placenta Previa (n=25)	P-value
	29.88±4.9	24.21±3.8	27.93±5.1	0.0001

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REFERENCES

1. Asicioglu O, Sahbaz A, Gungorduk K, [et al.]. Maternal and perinatal outcomes in women with placenta praevia and accreta in teaching hospitals in Western Turkey. J Obstet Gynaecol., 2014; 34: 462–466.
2. Maher MA, Abdelaziz A, Bazeed MF. Diagnostic accuracy of ultrasound and MRI in the prenatal diagnosis of placenta accreta. Acta Obstet Gynecol Scand., 2013; 92: 1017–1022.
3. Kiondo P, Wandabwa J, Doyle P. Risk factors for placenta praevia presenting with severe vaginal bleeding in Mulago hospital, Kampala, Uganda. Afr Health Sci., 2008; 8: 44–49.
4. Abbassi-Ghanavati M, Greer LG, Cunningham FG. Pregnancy and laboratory studies: a reference table for clinicians. Obstet Gynecol., 2009; 114: 1326–1331.
5. Gordon MC. Maternal Physiology. In: Gabbe SG, Niebyl JR, Simpson JL, Landon MB, Galan HL, Jauniaux ERM, [et al.]. Obstetrics: Normal and Problem Pregnancies, Sixth edition. Philadelphia. Saunders, an imprint of Elsevier Inc., 2012; 53.
6. Pitkin R, Witte D. Platelet and leukocyte counts in pregnancy. JAMA., 1979; 242: 2696.
7. O'Brien JR. Platelet count in normal pregnancy. J Clin Pathol., 1976; 29: 174.
8. Fay RA, Hughes AO, Farron NT. Platelets in pregnancy: hyperdestruction in pregnancy. Obstet Gynecol., 1983; 61: 238–240.
9. Park CW, Moon KC, Park JS, [et al.]. The frequency and clinical significance of intra-uterine infection and inflammation in patients with placenta previa and preterm labor and intact membranes. Placenta., 2009; 30: 613–618.
10. Aydogan P, Kahyaoglu S, Saygan S, [et al.]. Does cervical ureaplasma/mycoplasma colonization increase the lower uterine segment bleeding risk during cesarean section among patients with placenta previa? A cross-sectional study. Eur Rev Med Pharmacol Sci., 2014; 18: 2243–2247.
11. Bowman ZS, Eller AG, Kennedy AM, [et al.]. Accuracy of ultrasound for the prediction of placenta accreta. Am J Obstet Gynecol., 2014; 211: 177.e1–7.
12. RAIL-R2 levels are associated with placenta accreta. Placenta, 2016 Mar; 39: 1-6.