Original Article

Relationship Between Previous Cesarean Section Scar, Subsequent Implantation of Gestational Sac and Abnormal Invasive Placenta

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ABSTRACT

Objective: To analysis the relationship between previous caesarean scar and subsequent implantation site of gestational sac and abnormal invasive placenta.
Study Design: Prospective Cohort Study
Place and Duration of Study: This study was conducted at the Al-Tibri Medical College and Hospital, Isra University and Fatima Bai Hospital from November, 2019 to November, 2020.
Materials and Methods: 79 Pregnant women were enrolled in the study and examined the transvaginal ultrasound and abdominal Doppler ultrasound in 1st trimester for the implantation of gestation sac, placental localization, placental myometrial interface and inter-placental lakes at the first, second and third trimmers by ultrasound.
Results: Among 79 patients the mean age was 26.25± and the odd ratio was 0.0128 at $P < 0.0001$. R value in Regression model was to be found 0.698.
Conclusion: Previous caesarean scars showed weak positive association with placenta accrete diagnose 1st trimester. Higher the number of CS scar more susceptible to the placenta accrete.
Key Words: Placenta accrete, caesarian scar

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INTRODUCTION

The placenta initially develops during blastocyst stage and is expelled with the fetus at the time of delivery. The fetus depends on the placenta for its development and growth. Abnormalities of placenta may effect embryonic and fetal development badly.

Placenta accrete spectrum (PAS) is an abnormally invasive placenta (AIP), encompasses a spectrum of disorders where placenta attaches in a pathological manner to the myometrium[1]. It is described by an abnormal adhesion to and abnormal trophoblastic annexation through the Utrine serosa and myometrium[2,3]. Abnormal Placental invasion (previously called as morbidly adherent placenta) is split into increta, precreta and placenta accreta when placental villi is attached and invades into myometrium, this lead to the inward and outward development of the serosa and surrounding structure, respectively.[4,5] Incidence of AIP includes 75% as accreta, 18% as increta and 7% as percreta[6].

With the increasing rate of placenta accreta syndrome, the peripartum hysterectomies, neonatal complication, maternal haemorrhage and maternal morbidity and maternal mortality has been risen[7]. The common risk factors for PAS encompass placenta previa, prior caesarean section or uterine surgery[3, 8]. Additional risk factors are progressive maternal age, multiparity, previous uterine curettage and Asherman's syndrome [9].

Caesarean section have increased from 4.5 percent in 1965 to 33 precent now, with parallel rise in occurrence of placenta accreta from 1 in 2510 pregnancies to 1 in 333 pregnancies in the past decades[7].

Prenatal diagnosis of PAS has been seen to decrease mortality and morbidity occurred in these conditions because it facilitates planned intervention[10]. Early 1st Trimester ultrasound (Five -Seven weeks) has been advised to detect the likelihood of developing PAS disorder in women at high risk of these anomalies[11]. Other modality of imaging includes MRI, however definitive diagnosis of the condition is depended on the pathological evaluation after hysterectomy[6].

The classic ultrasound findings of PAS or AIP have been elucidated including the:

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Dropping of normal uteroplacental interface (clear zone)[2]

1. Extremely thin underlying myometrium (less than 1mm thick)
2. Vascular alterations within the placenta (lacunae) and placental bed (hypervascularity)[2].

Ultrasound findings are correlated with these pathophysiology[2]. Imperfection of the endometrium-myometrial interface favours a defective or abnormal decidualization and causing the infiltration of trophoblastic tissue within the myometrium, sometimes to serosa and neighboring organs[2].

It important to examine or evaluate the chances and liklehood of the PAS during the ultrasound in the pregnant women having previous cesarean scar[12]. A review in which 551 risk pregnancies were analyzed and their 1st trimester ultrasound finding includes 82% low implantation of gestational sac, 63 % reduced myometrial thickness, and 46% lacunae[13]. Low implantation of gestational sac in pregnancies made the women more susceptible to the AIP[13].

Cecarean scar and gestational sac position relationship can be classified as the following

a) Cross-over[14,15] sign(cos)
   COS 1 : The size of the sac above endometrial line is 2/3 diameter
   COS 2 : The size of the sac above endomet line 2/3 diameter
b) The implantation of the sac in dehiscent scar, (Implantation on cured scar versus "niche") [16]
c) Above versus below implantation from the the utrerine midline.
   COS 1 below the utrine mid line implantation "in the niche" are positively correlated with the acute type of PAS
   COS 2 Above the utine mid line implantation on the scar exhibits mild types of PAS

We aimed to study the relationship between previous caesarean scar and subsequent implantation site of gestational sac and abnormal invasive placenta.

MATERIALS AND METHODS

This multicentered prospective cohort study was performed in the Al-Tibri Medical College and Hospital, Isra University and Fatima Bai Hospital. This particular study and its protocol was approved by Local ethical committee. Informed consent had been taken from the participants. This study was done for the period of one year. Inclusion criteria was the pregnant patients 20—40 years of age, having singleton intrauterine pregnancy with gestation age 6—11 weeks and past history of one or two previous uterine lower segment cesarean section. All the patients were examined by the transvaginal ultrasound and abdominal Doppler ultrasound in first trimester for the implantation of gestation sac, placental localization, placental myometrial interface and inter-placental lakes then followed by ultrasound in second and third trimester. The patients with the age of above 40 years and having multiple pregnancies with no scarred uterus were excluded. Sample size was calculated by convenient sampling method.

RESULTS

Table I: Shows Mean age of the patient enrolled in the study lies in the range of 20-40 years with mean value of 26.25±.

Table II: Shows frequency and percentage of Previous cesarean history 45 subject were having one cesarean and 34 subjects were had two cesarean procedures.

Table III: Shows Best fit regression model between the previous caesarian and the Placental Accreta, **R** value showed positive significant co-relation i.e., 0.698, and it reflects that the patients with previous cesarean history made them more susceptible increases the chances of Placental Accreta

Table IV: Shows the Odd ratio 0.0128. The results show that the cesarian scar patients are 0.01 time more susceptible to have placental accrete.

Table V: Shows frequency and percentage of diagnosed case with Placenta Accreta during third trimester among 79 subjects was 1(1.26%) with history of cesarian section.

Table No.1: Age Distribution among the patients

	N	Minimum	Maximum	Mean	Std. Error
Age	79	20	40	26.25	.613

Table No.2: Frequency and Percentage of History of Pervious Cesarian Scar among the patients

	Frequency	%
One C/S	45	57.0
Two C/S	34	43.0
Total	79	100.0

Table No.3: Regression Model Third Trimester and Placental Accreta

Model	R	Std. Error of the Estimate
	.698[a]	.366

Table No.4: Odds Ratio

Odds ratio	0.0128
Significance level	P < 0.0001

The Odd ratio was calculated through online tool Medcals.

Table No.5: Frequency of Placenta Acreeta Diagnosed Patients in their Third Trimester

		3rd Trimester		
		Normal	Placenta Accreta	Total
Pervious_Cesarian	One C/S	44	1	45
	Two C/S	34	0	34
Total		78	1	79

DISCUSSION

According to the studies the anterior low lying or major placenta previa with a previous CS scar are highly predictive to the susceptibility of the PAS[18-19], which is to be evaluated by ultrasound screening from 18th week gestation. As this study also showed the week positive association between previous CS scar and PAS. According to the study there is a 2 fold increased risk of PAS disorder after the CS and which is contracted with the results of this study 0.06 fold increased risk of PAS after the CS[20]. A systematic review reported that the PAS incidence in women with no CS scar is around 3.3% to 4 % and around 50-70% with three to more scars. As in this study all the subject were not having more than 2 CS scar and incidence of the PAS is 1.26% -1 in 79- this also seconds the results of the study[21]. Study published in USA reported tha incidence of the PAS and prior CS was 67%, 61%, 40%, 11%, and 3% for five, four, three, two and one previous CS deliveries[22]. Multiple studies reported the complications like hemorrhagic shock, rupturing of utrine, postpartum hemorrahage(PPH) before the labour in PAS women[23-26].

As per the reported studies PAS is contributing factor to increase in maternal death but influenced by the early diagnosis and following intervention[27] PAS may lead to Peripartum hysterectomy(PH). Reported study in US 38% PH patients were having PAS[28].

The gradually increment in the frequency and the hurdle in the management of PAS. We felt the need to of this study which reflected the positive association of PAS with the previous CS scar which leds to the other complication in pregnant women and mostly lead to maternal death during the deliveries. Early detection and proper management of the condition can help mitigating the effects of PAS. However, there is a rising interest in and practice of expectant treatment of PAS, firstly to reduce fatal and very morbid complications associated with rapid hysterectomy, and, secondarily, to maintain the uterus when indications and preconditions are met. The roughly, a quarter of pregnancies that are successful.

CONCLUSION

In pregnant women previous caesarean scar is biologically as well as statistically showed weak positive association with the occurrence placenta accrete.

Author's Contribution:

Concept & Design of Study:	Bushra Zulfiqar
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Data Analysis:	Shagufta Perveen, Kausar Parveen
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