UTERINE SCAR IS A RISK FACTOR FOR PLACENTA PREVIA A CASE CONTROL STUDY

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ABSTRACT

OBJECTIVE: Uterine scar is a risk factor for placenta previa. A case control study

MATERIAL AND METHODS: The study was conducted in Gynae A Unit of Khyber Teaching Hospital Peshawar from June 2021 to November 2021. Sample size 81 was used according to Kelsey sampling formula. Patients were divided into 2 groups. Group A includes 27 patients with placenta previa as cases and group B includes 54 patients admitted as control. An informed consent was taken from the patients. Secondary risk factors like age, parity, miscarriages, uterine curettage, smoking, history of myomectomy, previous cesarean sections and previous history of placenta previa were also evaluated. Other causes of antepartum hemorrhage like placental abruption and bleeding due to local causes and unclassified APH were excluded from the study.

RESULTS: A total of 2467 patients were delivered during the study period. Among them 27 presented as cases of placenta previa and 54 were taken as control with case to control ratio of 1:2. Most common risk factor leading to placenta previa was advanced maternal age > 35 years (OR= 5.2, P-value 0.001) followed by previous cesarean section (OR= 2.96, P-value 0.026), history of curettage (OR= 2.29, P-value 0.095) and history of miscarriage (OR= 2.21 P-value 0.005).

CONCLUSION: Uterine scar is a risk factor for placenta previa.

KEY WORDS: Placenta previa, uterine scar, vaginal delivery

INTRODUCTION

Placenta previa is defined as placenta which is located abnormally in lower segment[1]. It is associated with vaginal bleeding at any time during pregnancy. Bleeding associated with placenta previa is more common in 3rd trimester either spontaneous or after sexual activity. It is diagnosed by either abdominal ultrasound or more accurately by trans vaginal ultrasound. Its incidence is 3-4/1000 pregnancies but varies worldwide[2].

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Placenta previa is divided into two major types, complete and partial depending upon the level of involvement of internal os, though 4 grades have been defined by many authors[3]. Blood loss associated with placenta previa leads to high maternal[4] and neonatal[5] morbidity and mortality.

Placenta previa occurs due to abnormal implantation of the embryo at or near the cervix. As the pregnancy advances and the developing embryo enlarge placenta usually migrates and 90% or more identified as low lying are resolved by last trimester. Placenta itself does not migrate but it tends to grow towards fundal area where blood supply is more[6, 7]. However in some patients placenta does not move and occupies the lower uterine segment, sometimes even covering the whole cervix. This defective decidual reaction may be as a result of abnormal vascularization due to inflammatory or atrophic changes. Placenta previa at times may be morbidly adherent to the uterus leading to massive hemorrhage and hysterectomy. This morbid adherence is due to absence of decidua basalis layer. If placental fibers attach directly to myometrium it results in placenta accreta. If placenta invades the myometrium, it would result in placenta increta

and if it reaches up to serosa of uterus it will be called placenta percreta.

The cause of placenta previa is endometrial damage due to multiple factors. The major factors leading to endometrial damage are multiparity, previous cesarean section and uterine curettage. Other etiological factors include multiple pregnancies, advancing maternal age[8], miscarriages, previous history of placenta previa, cocaine and smoking abuse. Among all these risk factors, the most common risk factor is uterine damage due to surgical procedures and multiparity[9, 10].

If the embryo is implanted at previous cesarean scar, then it would lead to adherent placenta. So placenta accreta is more common among women who have previous cesarean section[11].

The number of previous cesarean section is directly proportional to the risk of placenta previa approximately 3-10%[12]. A single cesarean section increases the risk by 0.65%, two increases the risk by 1.5%, three increases the risk by 2.2% and four or more increases the risk by 10%[13].

With increasing rate of cesarean section worldwide, the number of placenta previa and placenta accreta is also increasing which results in more feto-maternal morbidity and mortality, increased risk of blood transfusion, ICU and NICU admissions, preterm deliveries and even emergency hysterectomies[14, 15].

Complications of placenta previa include higher maternal mortality and morbidity in the form of antepartum and postpartum hemorrhage, ICU admissions, deep venous thrombosis and its complications, massive blood transfusions and hysterectomy and even septicemia. Fetal complications include prematurity, low Apgar score, increased NICU admissions, fetal anemia and even fetal death.

The objective of our study was to find out the role of uterine scar as a risk factor for subsequent development of placenta previa.

MATERIAL AND METHODS:

The study was conducted in Gynae A Unit of Khyber Teaching Hospital Peshawar from 1 June 2021 to November 2021 after approval from hospital IREB (Institutional Research and Ethical Review Board) No. 724/DME/KMC dated 26/04/2021. Non-probability random sampling technique was used. A sample size of 81 was taken with 27 cases and 54 controls according to Kelsey sampling formula (considering its prevalence as 0.64% at 5% margin of error)[16]. Patients who presented with vaginal bleeding and were diagnosed as a case of placenta previa on ultrasound were included as cases. 54 patients were taken as control on random basis. Other causes of antepartum hemorrhage like placental abruption and bleeding due to local vaginal or cervical causes or unclassified APH were excluded from the study. After taking informed consent, a detailed history was taken from the patients. Secondary risk factors like age, parity, miscarriages, uterine curettage, smoking, history of myomectomy, previous cesarean sections and previous history of placenta previa were also evaluated.

Placental localization was done by ultrasound. A questionnaire was established that include detailed information about maternal age, parity, gestational age, history of previous caesarean section, history of bleeding per vagina, history of miscarriage or uterine curettage and previous history of placenta previa.

Data was analyzed using SPSSv21. Odds ratio was calculated to find out the relationship between previous caesarean section and subsequent placenta previa. P value was calculated for all the variables and value < 0.05 was taken as significant. Mean of both case and control groups were compared on the basis of different variables

RESULTS

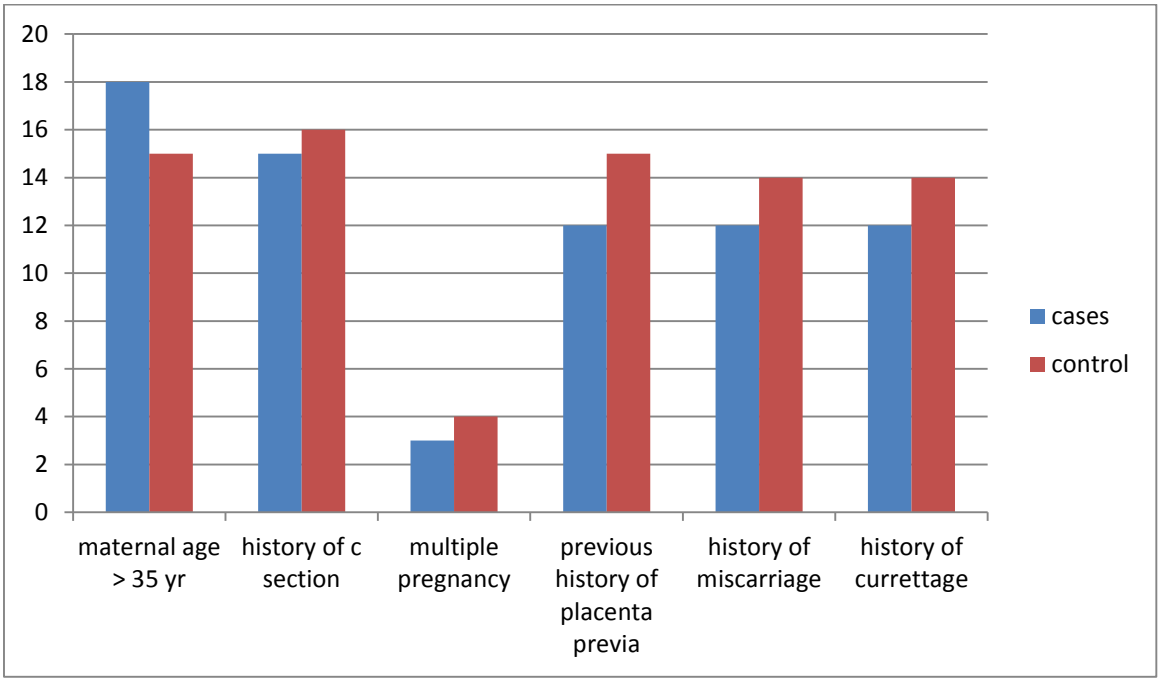
A total of 2467 patients were delivered during study period in Gynae A unit. Out of these, 81 patients were included in the study with 27 cases and 54 were taken as control with case to control ratio of 1:2. Graph 1 shows frequency distribution of cases and controls. A total of 27 cases of placenta previa were recorded during study period. Highest incidence of placenta previa was in women > 35 years of age (66.6%). Average age of the patients with placenta previa was 32 years with a range of 25-44 years. Advanced maternal age (>35 years) was significantly associated with cases of placenta previa as p-value was 0.001. While other risk factors like previous cesarean section, uterine curettage and previous history

of miscarriage were also significantly associated with placenta previa as their p-value were < 0.05.

Table 1 shows comparison of frequency, percentage, odd ratio and p value for different risk factors in cases and controls. Most common risk factor leading to placenta previa was advanced maternal age > 35 years (OR= 5.2, P-value 0.001) followed by previous cesarean section (OR= 2.96, P-value 0.026), history of curettage (OR= 2.29, P-value 0.095) and history of miscarriage (OR= 2.21 P-value 0.005). Previous history of placenta previa (OR= 2.08, P-value 0.136) and multiple pregnancy (OR= 1.56, P-value 0.578) were not significant risk factors in our study as their p value was not significant.

Table: 1 Frequency, percentage, odd ratio and P-value of risk factors for placenta previa in cases and control

Risk factors	Cases 27 (%)	Controls 54(%)	Odds ratio	P – value
History of cesarean section	15(55.5)	16(29.6)	2.96	0.026
Age > 35 years	18(66.6)	15(27.7)	5.2	0.001
Multiple pregnancies	3(11.1)	4(7.4)	1.56	0.578
Previous history of placenta previa	12(44.4)	15(9.2)	2.08	0.136
History of Miscarriage	14(51.8)	11(20.3)	2.21	0.005
History of Curettage	12(44.4)	14(18.5)	2.29	0.095



Graph 1: Frequency distribution of cases and controls

DISCUSSION

Placenta previa and its associated complications have increased maternal and fetal morbidity and mortality. Placenta previa is mostly associated with antepartum and postpartum hemorrhage which may be severe enough requiring multiple blood transfusions[17]

and even placenta previa is higher in patients with history of previous cesarean section and curettage.

Advancing maternal age has got a significant role in the increasing number of placenta previa according to our study. A study by Iacovelli A [18] also shows that placenta previa is more common after 35 years as compared to those who are < 25 years. Similarly a study by Omekanye L.O[19] also indicates that placenta previa is more common in advanced age. The exact mechanism for placenta previa in patients with increasing age is not known but could be due to sclerotic changes in intramyometrial vessels.

Previous history of cesarean section was found to be significantly associated with subsequent development of placenta previa as its p-value was significant. Similar results have been shown in study by Ashraf S[20] who shows that placenta previa is more common with scarred uterus. Another study by Javed A[21] also showed that 98(68.05%) patients out of 144 had a history of previous cesarean section. Similarly according to study by Zahoor S[22], frequency of placenta previa was high in patients having a previous history of cesarean section. As the number of cesarean section increases, risk of placenta previa also increases significantly because of damage to the endometrial lining.

Previous history of miscarriage and curettage is also associated as contributory risk factor for placenta previa. In our study their p-value was significant. A study by Karami M[23] also indicates an increased risk of placenta previa in patients with history of miscarriage and curettage.

Previous history of placenta previa and multiple pregnancy are considered to be risk factors for placenta previa in many studies[24] but in our study its association was low because the P-value was not significant.

The knowledge of risk factors for the development of placenta previa is important for the obstetricians as early and proper diagnosis of placenta previa is important especially for those women who have low compliance for antenatal care. Careful ultrasound location of placenta previa and its morbid adherence is essential for proper and timely referral to tertiary care hospital to reduce the maternal and perinatal morbidity and mortality.

CONCLUSION

Uterine scar can be in form of previous cesarean section, uterine curettage or miscarriage. Our study shows that placenta previa has significant association with previous uterine damage and increasing age and this would result in increased risk of subsequent development of placenta previa, placenta accreta and percreta and its associated morbidity and mortality. So our main focus should be implementation of vaginal deliveries as much as possible and to reduce the number of primary cesarean section. We also emphasize the importance of antenatal care and adequate and timely referral to tertiary care hospital for proper management.

DECLARATION

Authors' Contribution

Akhtar N made the initial idea, collected the data and wrote the initial manuscript. Samad A helped in data analysis, statistics and references. Naz N reviewed the article and made correction.

Conflict of Interest

All authors have no conflict of interest.

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