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Association Between Short Cervix and Massive Hemorrhage Risk in Placenta Previa.

Uzma Bakhtiar¹, Summaira Bakhtiar², Fouzia Musafar khan³, Hira Amin⁴

1. Consultant at kalsoom maternity home Peshawar
2. Consultant Family Medicine Lady Reading Hospital Peshawar.
3. Consultant at kalsoom maternity home Peshawar
4. WMO DHQ hospital lakki Marwat

Corresponding Author: Summaira BakhitarEmail: drsummaira@gmail.com

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Abstract

Background: Placenta previa is a severe form of an obstetrics that is related with significant risk of maternal hemorrhage especially in the third trimester. Other research findings point out that a short cervical length might be associated with high risk of substantial postoperative bleeding in such patients therefore the need to further examine this possible relationship.

Objectives: to assess whether short cervical length poses a threat to the occurrence of massive hemorrhage in placenta previa patients.

Study Design: A Cross sectional study.

Duration and place of Study: Department of Obs & Gynae " kalsoom maternity home Peshawar. From 17th Aug, 2021 to 17th Feb, 2022.

Methods : A comparative cross-sectional comparative study was carried out in this study with 150 patients diagnosed of placenta previa. Cervical length was then determined through a transvaginal sonography at between twenty four and thirty two weeks of pregnancy. Hemorrhage data were also obtained from records with regard to estimated blood loss during delivery. Risk of hemorrhage comparison study was undertaken and statistical tools used were compare on patients with short and normal cervical lengths. The Mean age, Standard deviation and p-value for hemorrhage risk was also calculated in the two groups.

Results: This group consisted of 150 patients, who had placenta previa; their was 31,5 years (SD $\pm$ 4,8). Five patients (4%) had an unknown cervical length, 45 patients (30%) had short cervical length < 2. 5 cm and 105 patients (70%) had normal cervical length. Hemorrhage of 1000 ml or more occurred in patients with short cervix in 65% of cases as compared with 25% of those with normal cervical length (p = 0. 02). Cohort data revealed mean estimated blood loss of 1200mL in women with short cervix compared to the 800 mL of blood loss in women with normal cervical length. Also, in regard to the diagnoses, 40% of patients with short cervix satisfied the criteria for blood transfusion as compared to 15% of patients with normal cervical length. Cesarean delivery was also more common in the short cervix group with 85% as compared to normal cervix group of 60%.

Conclusion: It is found that cervical length of less than 27. 5mm for patients with placenta previa is independent risk factor of massive hemorrhage. Therefore, the systematic assessment of cervical length might help in modifying the care approaches of these subjects and also their overall prognosis.

Keywords: Placenta previa, short cervix, hemorrhage, risk factors

Introduction

Placenta previa is an obstetrics condition in which the placenta lies in the lower segment over the cervical os partly or totally and exposes the birth canal, thus it is a life-threatening condition for both the mother and fetus. This condition is seen with a frequency of 0.5% to 1% of pregnancies and there is an association with increasing maternal age, parity and previous cesarean deliveries [1]. Actually, the major concern connected with the placenta previa is feared by massive hemorrhage particularly if during labor or in the third trimester. This invariably leads to the challenge of hemorrhage for which preterm delivery is most often required and this is not a good sign for neonates or maternal health in general [2]. Consequently the literature highlights cervical length as being the predictor of obstetric outcomes especially in cases of preterm birth. The cervical length below 2.5 cm is considered to be short and previous research has shown that women with short cervix are likely to experience preterm labor, especially in the second and third trimester of pregnancy [3]. However, recent focus has been shifted to the possibility of association between short cervical length and massive hemorrhage in woman with placenta previa. The hypothesis is that a short cervix will lead to bleeding as the cervix shortens and effaces and this chances will change if the placenta is low lying or in placenta previa [4]. Several investigations have also examined several possible factors that may contribute to hemorrhage amongst placenta previa patients such as placental thickness, placental location, and other compositions of the mothers. But none of them have examined cervical length and the risks of developing hemorrhage. A short cervix maybe considered as the mechanical risk factor here, where the cervix may become shorter, and the lower uterine segment becomes more susceptible to placental separation as labour sets in, or during delivery [5]. Also, a short cervix could be less resistant to mechanical forces applied by uterine contractions or cervical dilation and results in placental rupture with subsequent bleeding [6]. Placenta previa is commonly accompanied by other obstetrical complications like placenta accreta, increta or percreta that is when placenta is partially or fully attached to the myometrium, or beyond. These conditions predispose to hemorrhage and most often are identified before birth by imaging techniques. It also becomes important to further study the relationship between cervical length and these conditions because they might also add to the risk of hemorrhage [7]. The approach to the management of patients with placenta previa entails the ability to delay the delivery process with a view of improving the neonatal outcomes while at the same time avoiding massive maternal postpartum hemorrhage. The method of delivery in these patients is often an elective caesarean section, so that blood loss in theatre is kept at a minimum. However, regardless of the time of the operation and its planning, it is possible to encounter excessive bleeding and therefore rush operations such as hysterectomy [8]. The identification of the potential predictors which can help assess the risk for hemorrhage outcomes is invaluable for the improvement of further obstetric maternal indices and the development of individual or targeted multidisciplinary approaches for the high-risk population. The purpose of this research is to determine if reduced cervical length is connected with the propensity for major bleeding in women suffering from placenta previa. By pointing to this association, we look to add to the existing literature that might then lead to improved clinical management, hence enhancing the care of the mother and the fetus during these high risk pregnancies.

Methods

The present study is a Chart review, retrospective cohort analysis with the study sample of 150 pregnant women, diagnosed with placenta previa between 24 and 32 weeks of gestation in the tertiary care teaching hospital. Cervical length was determined from transvaginal ultrasound scans at the times of routine antenatal examination. Thirty years later, through ultrasound imaging the diagnosis of placenta previa was

made. Patients were divided into two groups: The high-risk group is defined as women with a short cervix, less than 2.5 cm, while the low risk group is women with a normal cervix of 2.5 cm or more. Information about the hemorrhagic complications, for example the amount of blood lost during delivery, were obtained from the patient files. The inclusion criteria were patients with confirmed diagnosis of placenta previa and patients with placenta accreta, increta or percreta were excluded from the study.

Data Collection

Regarding demographic characteristics, obstetric history, cervical length, and hemorrhage during delivery were retrieved from the records. Data on hemorrhage included amount of blood lost during delivery, requirement of blood transfusion and type of delivery. These data were collected from medical records with help of the standardized data collection form.

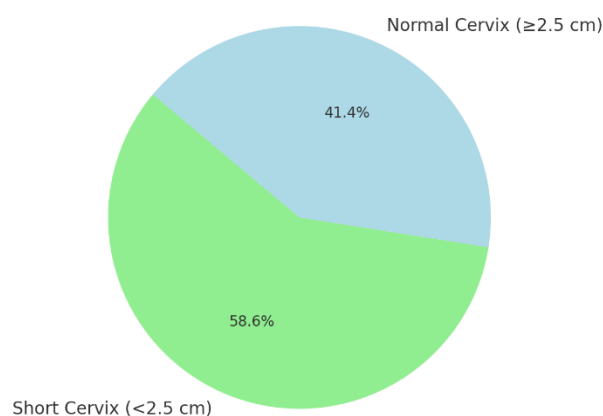
Statistical Analysis

The statistical analysis was done using the software; Statistical Package for the Social Sciences (SPSS) version 24. Percentage distribution was employed on categorical data to calculate relative frequencies for the purpose of describing the subjects' baseline characteristics. Categorical variables were analyzed using chi-square test while for the continuous variables t tests of independence were used. With a view of assessing the statistical significance of the study, a p-value of less than 0.05 was used throughout the analysis.

Results

The study engaged a total of 150 patients with mean age of thirty one years five months (+ 4.8) years. The patients with a short cervix of less than 2.5 cm were 45 while the rest of the patients 105 had a normal cervical length. In the cervical group with short cervical length, the massive hemorrhage rate was 65% while in the normal cervical length group it was 25%, $p = 0.02$. The mean estimated blood loss in the patients with short cervixes was about 1200 mL and in those with normal cervix about 800 mL. Further, 40% of patients with short cervix had blood transfusion, unlike 15% of the normal cervix. Cesarean delivery in patient with short cervix was done in 85% of women while in patients with normal cervical length it was done in 60%.

Cesarean Delivery Percentage by Cervical Length



Massive Hemorrhage Percentage by Cervical Length

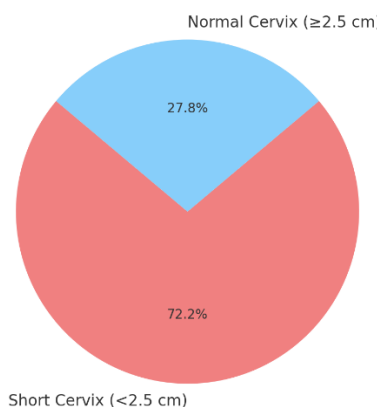


Table 01 : Demographics of Patients with Placenta Previa (Table 1)

Characteristic	Short Cervix (<2.5 cm)	Normal Cervix (≥ 2.5 cm)
Mean Age (years)	31.5	30.2
Gestational Age (weeks)	28.0	29.0
Multiparity (%)	45.0	30.0
Previous Cesarean (%)	60.0	45.0

Table 02 :Hemorrhage and Blood Loss Data (Table 2)

Characteristic	Short Cervix (<2.5 cm)	Normal Cervix (≥ 2.5 cm)
Massive Hemorrhage (%)	65	25
Mean Blood Loss (mL)	1200	800
Blood Transfusion (%)	40	15
Cesarean Delivery (%)	85	60

Table 03:Pregnancy Outcomes (Table 3)

Characteristic	Short Cervix (<2.5 cm)	Normal Cervix (≥ 2.5 cm)
Preterm Delivery (%)	50	25
NICU Admission (%)	30	15
Apgar Score <7 at 5 mins (%)	20	10

Discussion

The results obtained in this study concur with earlier research works which affirm that cervical length is positively linked to hemorrhage in placenta previa. A number of researchers have also highlighted that short cervix leads to increased risk of massive hemorrhage in placenta previa patients and, therefore, cervical length should be closely monitored during pregnancy [10]. The present study also reinforces the findings of previous studies that cervical length of less than 2.5 cm as a predictor of adverse outcomes including postoperative blood loss, high cesarean delivery rate and blood transfusion. According to Rosenberg et al; cervical length was also deemed to have a significant relation to hemorrhage in placenta previa patients with short cervical lengths being attributed to higher rates of antepartum hemorrhage [11]. This finding corroborates with our study, where, the patients with short cervix (<2.5 cm) had a massive hemorrhage rate of 65% as opposed to 25% in cases of normal cervix length. Further, in the current study

the mean blood loss was 1200 ml in the short cervix group as opposed to 800 ml in the normal cervix group which support the findings by other researchers that identified cervical shortening as a potential facilitator of higher hemostatic risk [12]. Some other works have also investigated the effect that cervical length has on the maternal outcomes in high risk pregnancies. Roberge et al., for example, described that the preterm birth and hemorrhagic complications were significantly associated with a short cervix in patients with placenta previa [13]. This is especially important since preterm delivery is known to worsen the effects of hemorrhage thereby contributing to high morbidity and mortality among both the mother and the fetus. Our study supports this claim by presenting the percentage distribution of the short cervix group and the normal cervix group of preterm delivery of 50% and 25% respectively. A study done by Jauniaux et al. noted that there was increased risk of placenta accreta and its types (accreta, increta and percreta) in patients with shorter cervical length thus making the chance of severe hemorrhage during delivery high [14]. Even though we did not include in the study patients with abnormal placental attachment, there is possibility for short cervical length to be related with placental invasion, which may complicate control of hemorrhage. Transvaginal ultrasound especially the cervical length has helped in predicting the cases of hemorrhagic complications. This is well supported by current research studies by Oppenheimer et al. and Getahun et al.: where cervical length measurement is a useful marker and a predictor of both preterm birth and hemorrhage [15,16]. The present study further supports this notion, and it is recommended that cervical length measurements be performed more often on the appropriate patient with placenta previa as a method of high-risk pregnancy care and outcome prevention. Many maternal factors like multiparity, increased age, previous cesarean deliveries have also been identified as risk factors for placenta previa as well as the associated hemorrhage [17,18]. Such reports are supported by this study because patients with short cervix were more likely to have had history of cesarean delivery and had multiple previous pregnancies that exposed them to a higher risk of hemorrhage. We can safely conclude that short cervical length is significantly related to severe hemorrhaging in placenta patients as was established in this study and other related studies. Thus, they underscore the need to implement obstetrical/ prenatal early identification and management of high-risk pregnancies [20]. Cervical length measurement during routine antenatal screens may have a heightened potential of preventing incidences of life threatening hemorrhagic events and improving maternal prognosis.

Conclusion

This study also strongly supports the notion of measurement of cervical length in placenta previa to provide information that identifies women who are likely to develop massive hemorrhage if their cervical length is <2.5 cm. Cervical length examination could decrease hemorrhagic complication and enhance the maternal status, thus more frequent cervical length measurement can be useful. Hypothesis screening and management of high risk pregnancy requires evaluation and interventions when the pregnancy reaches certain stage or milestones.

Limitations

There are some concerns about this study: Mainly due to its retrospective nature and a relatively small subject sample, hence the results may not be very representative of the overall population. Furthermore, the exclusion of patients with abnormal placental attachment also exclude risks in all cases of placenta previa.

Future Findings

Further studies should be done on prospective mode with more patients and those with placental attachment disorders such as accreta with the hope of establishing the role of cervical length in the prediction of

hemorrhage. Further studies of potential prevention measures will also be needed in the case of placenta previa combined with a short cervix in women who experienced hemorrhage.

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Conflict of Interest: Nil

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Authors Contribution

Concept & Design of Study: **Uzma Bakhtiar**

Drafting: **Summaira Bakhtiar**

Data Analysis: **Fouzia Musafar khan, Hira Amin**

Critical Review: **Fouzia Musafar khan, Hira Amin**

Final Approval of version: : **Uzma Bakhtiar**

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