Evaluation of the risk factors for cases of Placenta Previa with Antepartum Hemorrhage in third trimester: A Retrospective Cross-Sectional study at a tertiary care centre in South India

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ABSTRACT

Background and Aim: Severe bleeding linked to placenta previa poses significant risks for maternal health, leading to increased morbidity and mortality rates. Identifying the determinants of severe bleeding in placenta previa during the antenatal period can help pinpoint mothers who are at risk. The current study aimed to investigate the prevalence of recognized risk factors and complications associated with placenta previa.

Material and Methods: A retrospective observational study was conducted at the Department of Obstetrics and Gynecology at Belagavi Institute of Medical Sciences, Belagavi over a period of 2 years from 0ctober 2022 to September 2024. This study involved 73 patients, focusing on the population demographics, which included female patients aged
18 to 44 years. The baseline characteristics and perinatal outcomes of individuals experiencing persistent placenta previa at the time of delivery were analyzed and the prevalence of risk factors were studied.

Results: Incidence of placenta previa was 0.5% of all deliveries in the study period. The study observed maternal ages spanning from 18 to 44 years. The most prevalent age group was 21-25years, comprising 44% of the cases, while 27% fell within the 26-29 years age range. The socioeconomic status of the study participants revealed that 40 individuals, accounting for 56%, originated from low-income families, while 33 individuals, representing 44%, came from lower-middle-income families. There was 1 mortality amongst the cases studied. 70% cases had one or more risk factors like previous cesaren section, previous abortion, teenage or advanced maternal age, third or higher gravida, multiple pregnancy and anemia etc.

Conclusion: previous cesarean sections, previous abortions with history of curettage, teenage pregnancy, increased age at pregnancy, and anaemia are risk factors for placenta previa. While developed nations report a maternal mortality rate of zero for placenta previa, the situation remains concerning in many developing countries, where the rate is still between 1-2%. Individuals diagnosed with placenta praevia are classified as high risk, necessitating the availability of compatible blood prior to the decision to proceed with a caesarean section. Patients with low lying placenta in midtrimester scan and having risk factors for placenta previa should be reffered at the earliest to higher care centres with 24 hours availability of Senior Gynaecologists, Anaesthetists, Pediatrician, blood availability, NICU and ICU care for better management and favourable maternal and perinatal outcomes of such high risk pregnancies

Introduction

Placenta previa occurs when the placenta is positioned over the endocervical canal, leading to a heightened risk of complications, including obstetrical hemorrhage and preterm birth.[1] In the past, the diagnosis of placenta previa typically occurred when a pregnant individual experienced painless vaginal bleeding in the third trimester. Today, thanks to routine midtrimester ultrasounds, this condition can be identified much earlier, often before any symptoms arise. It stands as a primary contributor to antepartum hemorrhage.[2] Approximately 0.4-0.5% of all labours are affected by this condition.[3] Placenta previa poses a considerable clinical challenge, as it places patients at heightened risk for substantial hemorrhage, often necessitating blood transfusions. In cases of intractable postpartum hemorrhage (PPH) and placenta accreta a cesarean hysterectomy might be necessary as a life saving procedure, occurring with an incidence of 5.3%. This intervention is associated with a three to fourfold increase in perinatal mortality when compared to a normal pregnancy.[4] Several risk factors have been identified for placenta previa, including endometrial damage resulting from D and C, previous caesarean deliveries, and myomectomies. Additionally, women who have experienced multiple pregnancies, particularly those with a high number of closely spaced pregnancies, face an increased risk due to potential uterine damage. Substance use during pregnancy, including alcohol, cocaine, and smoking, raises significant health concerns[5-7] Numerous studies have sought to identify the risk factors associated with placenta praevia, highlighting connections with advanced maternal age, parity, maternal smoking, infertility treatments, prior caesarean deliveries, previous instances of placenta praevia, and recurrent abortions. Several of the previously mentioned risk factors have seen a notable rise over the past few decades, including the frequency of caesarean sections, the age of mothers at childbirth, and the prevalence of women seeking infertility treatments.[8]

Neonates delivered by mothers experiencing placenta praevia face an increased risk of preterm birth, perinatal mortality, congenital anomalies, and lower Apgar scores at both 1 and 5 minutes, typically falling below 7.[8-10]. Research indicates that a significant number of infants experience perinatal morbidity, necessitating resuscitation and subsequent admission to the neonatal intensive care unit (NICU).[11] Additionally, a significant consequence of this condition is the occurrence of small for gestational age and low birth weight in affected individuals.[12, 13] The challenges associated with placenta praevia extend beyond the antepartum phase, impacting both the intrapartum and postpartum periods. These complications can lead to a significant likelihood of cesarean deliveries, peripartum hysterectomies, morbid adherence of the placenta, and postpartum hemorrhage. [14,15] Research has indicated that the incidence of hysterectomy in women diagnosed with placenta praevia stands at approximately 5%. Pregnancies affected by placenta praevia exhibit a notably increased incidence of postpartum anemia (OR 5.5, 95% CI: 4.4–6.9) and are associated with prolonged hospital stays.[16, 17]

Severe bleeding linked to placenta previa poses significant risks for maternal health, leading to increased morbidity and mortality rates. Identifying the determinants of severe bleeding in cases of placenta previa during the antenatal period can help pinpoint mothers who may be at risk. Timely interventions to assist women and ensure proper management can significantly reduce the risk of serious outcomes associated with maternal morbidity and mortality. The current study aimed to investigate the prevalence of recognized risk factors associated with placenta previa.

Material and Methods

A Retrospective observational study was conducted at the Department of Obstetrics and Gynecology over the course of 2 years from October 20222 to September 2024 at Belagavi Institute of Medical Sciences, Belagavi, South India. This study involved 73 patients to investigate the population, including female patients aged 18 to 44 years. All patients had

documented Ultrasound reports done by Radiologists confirming the diagnosis of placenta previa.

The baseline characteristics of individuals experiencing persistent placenta previa at the time of delivery were analyzed and prevalence of risk factors was evaluated. The study assessed various demographics and characteristics, such as age, history of previous operative interventions on the uterus including D&C, previous 1 or more Caesarean sections, hysterotomy or myomectomy, and the presence of comorbidities. These comorbidities included Preeclampsia, anemia, chronic hypertension, twins as well as pregestational and gestational diabetes mellitus.

Statistical analysis

The collected data was organised and input into a spreadsheet application (Microsoft Excel 2019) before being exported to the data editor interface of SPSS version 19 (SPSS Inc., Chicago, Illinois, USA).

Results

There were 15594 deliveries in the study period and 73 cases of placenta previa presenting with Antepartum hemorrhage in third trimester giving an incidence of 0.5% of all deliveries. The maternal age of participants in this study varied between 18 and 44 years. The most prevalent age group was 21-25years, comprising 44% of the population, while 27% fell within the 26-29years age range. In examining the socioeconomic status of the study participants, it was found that 40 individuals, representing 56%, hailed from low-income families, while 33 participants, or 44%, were from lower-middle-income families. (Table 1 and Table 2)

Table 1: Age Distribution of study participants

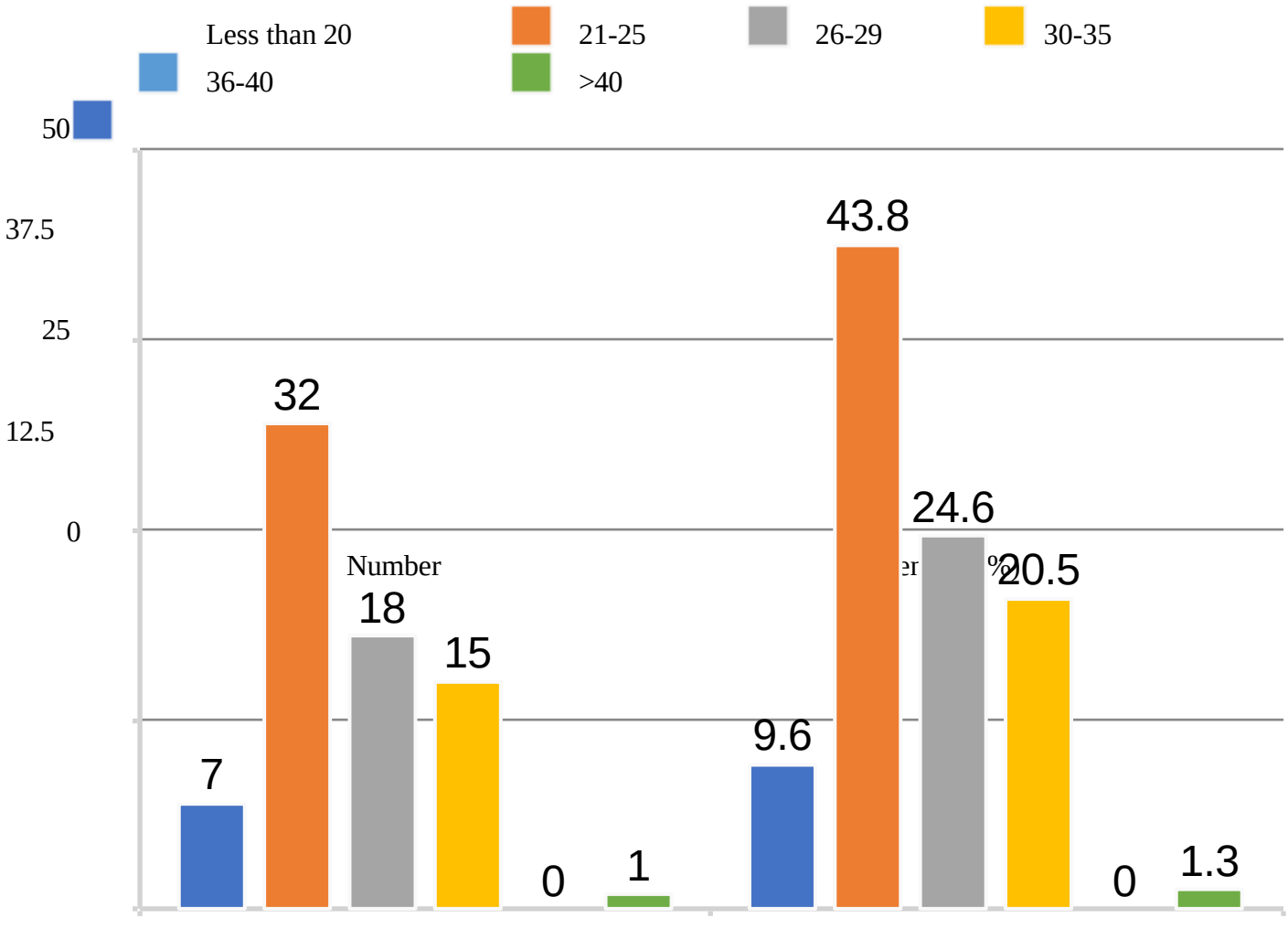


Table 2: Socioeconomic status of the patients

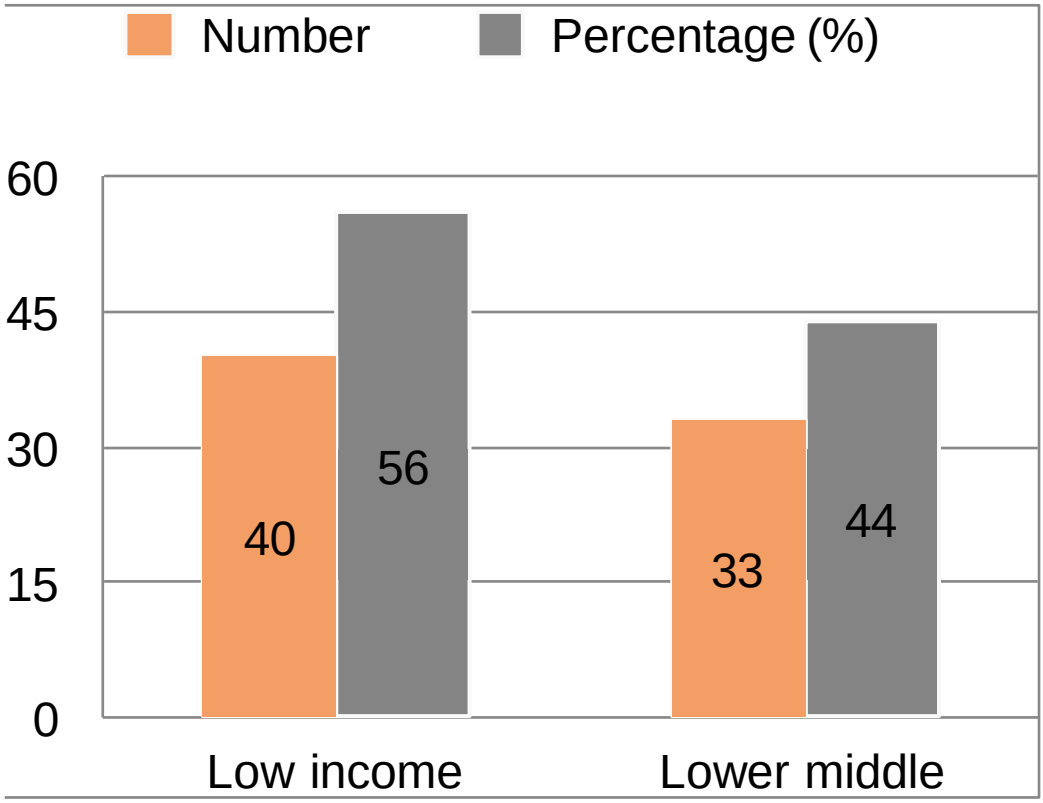


Table 3: Distribution of the study patients according to parity

Number of parities	**Number**	**Percentage (%)**
Primigravida	18	24.6
2nd gravida	31	42.4
3rd gravida	14	19.1
4th gravida	9	12.3
5th gravida	1	1.3

Table 4: Distribution of the study patients according to predisposing factors

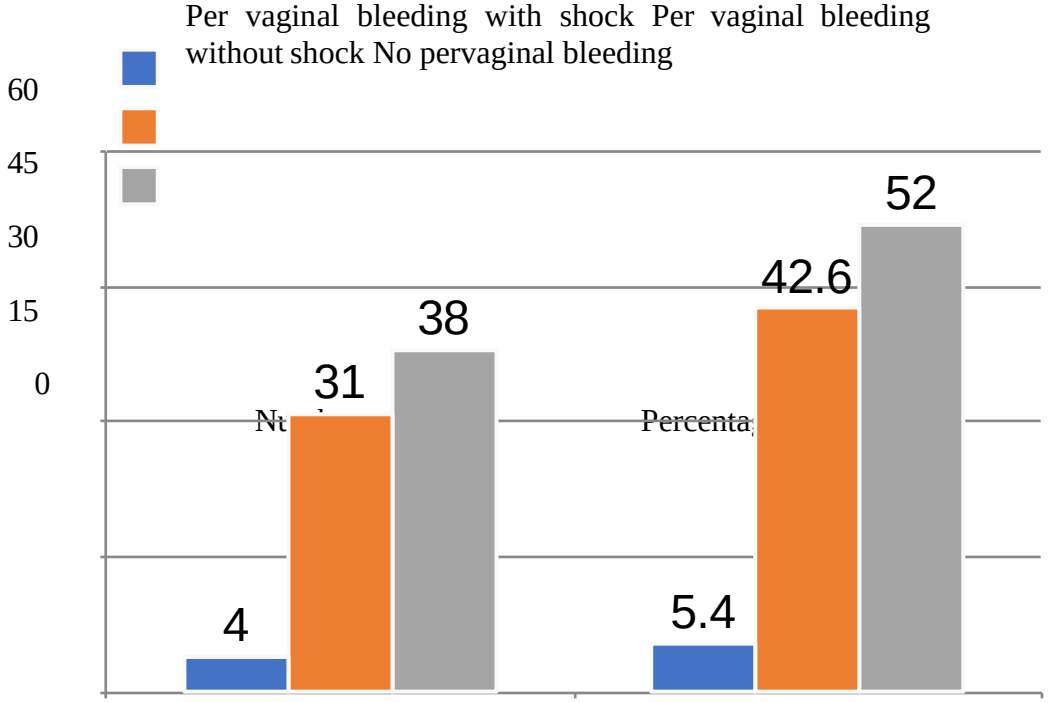
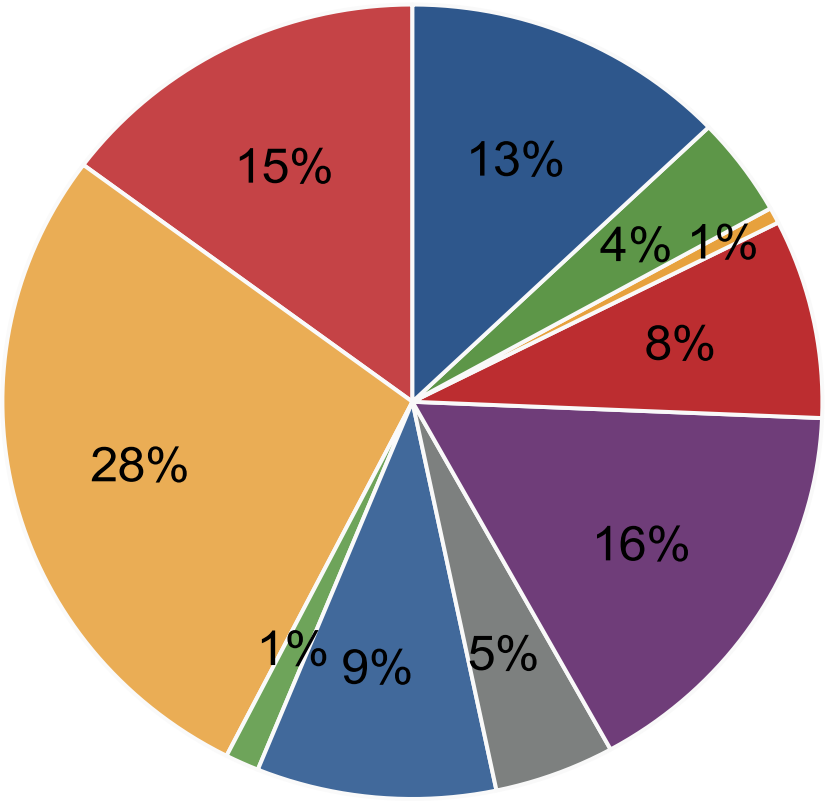


Table 5: Clinical presentation of patients during admission

previous 1 caeserian section - 19
previous 2 caserean section - 6
previous 3 caserean section - 1 previous abortion,D and C - 12 Gravida 3 or more - 24
teenage pregnancy-7 age >30 years - 14
multiple pregnancy-2 anaemia -40
no risk factors - 30



Discussion

Bleeding associated with placenta previa poses a significant risk in obstetric care. This research explored the link between various risk factors and negative outcomes for both mothers and newborns in cases of placenta previa. This study reveals that the incidence of placenta previa stands at 0.5%. A study conducted by Tuzovic et al reported an incidence rate of 0.4%.[19]

The current research indicates that the highest age incidence occurred in the 21–25 year range, accounting for 44% of cases. Ananth et al. noted that the age group of 25-29 years was the most prevalent in their research, aligning with the findings of the current study.[20] Research conducted by Sheiner and colleagues indicated that the highest incidence of cases occurred in individuals aged 25 to 34 years, accounting for 53.7% of the total.[21] A study by Choi et al. reveals that the prevalence of placenta praevia rises with advancing maternal age.[22] This phenomenon is believed to stem from atherosclerotic alterations in the uterus, which lead to inadequate blood flow and infarction of the placenta, consequently resulting in an increase in placental size.

A significant majority of the patients in this study, specifically 75.4%, were multigravida. A study conducted by Cotton et al. revealed that 16% of the patients were primipara, while 83.3% were multigravida.[23] This finding aligns with research conducted by Tuzovic and Ilijic, as well as Kollmann et al., which indicated that women with two or more pregnancies face a heightened risk of placenta praevia. Higher parity was associated with an increased risk of placenta praevia.[9.24] The phenomenon could be attributed to endometrial scarring at the locations of previous placental attachments, which may result in lower placental implantation. Additionally, atherosclerotic changes in blood vessels could contribute to reduced uteroplacental blood flow, ultimately leading to a large placenta encroaching on the cervical os in subsequent pregnancies. Previous studies have indicated that certain placental factors might be linked to the ongoing risk of placenta previa at the time of delivery. These factors include the position of the placenta and the extent of overlap with the endocervical os.[20, 25] The authors are currently conducting planned studies to examine various sonographic characteristics of persistent placenta previa in both nulliparous and multiparous populations, utilizing a distinct ultrasound database.

This study reveals that, regardless of age and parity, 70% of placenta previa cases are linked to various risk factors. 35.6% of the subjects had a history of previous caesarean sections, while 16.4% reported prior abortions, dilation and evacuation, or curettage. A study conducted by Tuzovic et al. revealed that 49.1% of patients had a history of abortion, while 9.9% had undergone a previous caesarean section.[19] Numerous studies have indicated a link between a history of caesarean delivery and the occurrence of placenta praevia. A meta-analysis involving 170,640 pregnant women revealed a concerning pattern of risk factors associated with placenta praevia, particularly linked to the rising number of caesarean section deliveries.[26] A recent cohort study conducted in a United Kingdom NHS hospital reveals that out of 131,731 women who underwent elective cesarean sections, 4,332 were diagnosed with placenta previa at term, resulting in a rate of 32.9 cases per 1,000 elective cesarean deliveries.[14] Surgical disruption of the uterine cavity is recognized for its potential to inflict enduring harm on both the myometrium and endometrium. The occurrence of a prior caesarean section can lead to complications related to angiogenesis at the surgical site, potentially resulting in localized hypoxia. The occurrence of hypoxia results in insufficient decidualization and irregular trophoblast invasion, which may contribute to placental adhesion issues.

This study identified type 2 and type 3 as the predominant forms of placenta previa among the patients examined, aligning with the findings of Usta et al.[27] Placenta previa is categorized based on its positioning in relation to the internal cervical os, which holds significant prognostic

implications for both mother and fetus. This study revealed that maternal morbidity rates were notably elevated among patients with type 4 placenta previa. Comparable results were noted by Breen et al. This study reports on a patient diagnosed with type 4 placenta previa, who had a history of cesarean section and was admitted in a state of shock due to significant bleeding associated with the condition. Following resuscitation, a cesarean section was performed, necessitating a risk bond, and a cesarean hysterectomy was required due to severe postpartum hemorrhage. In this study, 88% of patients received active management, while 12% were managed expectantly. This study reveals that women diagnosed with placenta praevia faced an increased risk of experiencing a postpartum hemoglobin level below 10 g/dl, which subsequently resulted in postpartum anemia. This finding aligns with earlier research conducted by Sheiner, which indicated that women with placenta praevia faced a sixfold increased risk of postpartum anemia.

There should be an increased confirmation of placenta previa through ultrasound, given that ultrasound facilities are accessible in all tertiary centers, including those at the district level. However, because of inadequate socioeconomic conditions, inconsistent or absent antenatal checkups, and a lack of awareness among many patients, individuals often present to the hospital after experiencing recurrent episodes of bleeding, with or without shock. Consequently, it is essential that following initial resuscitation, the immediate termination of pregnancy is carried out based on a clinical diagnosis of placenta previa.

Postpartum hemorrhage emerged as the most prevalent complication, occurring in 1% of cases. Four factors are associated with the occurrence of postpartum hemorrhage (PPH). The findings indicate inadequate retractility and contractility in the lower uterine segment, the presence of substantial uterine vessels at the placental site, placenta accreta partial or complete.. A study conducted by Usta et al. revealed findings regarding antepartum and postpartum complications among cases and controls. The placenta was extracted in segments in 22% of cases, with bed rest necessary in 18%.

Hysterectomy was required in 6 cases (8.2%) of cases. A recent study conducted by Shiener et al[8]. reported that postpartum hemorrhage occurred in 0.3% of cases, while placenta accreta was observed in 1.3% of cases.

Conclusion

Although the maternal mortality for placenta previa is nil in developed countries, unfortunately it is still 1-2% in most developing countries. Patients with placenta praevia should be considered as high risk, and compatible blood should always be available for such cases before considering caesarian section. Family planning should also be emphasized as a strategy towards reduction of parity, caesarean section rate, and thereby the incidence of placenta praevia. Strategies and protocols should be settled to reduce the rate of caesarean section, and senior staffs have to be involved in the management of cases of placenta praevia.

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