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Review of pregnant with placenta previa and risk of preterm delivery

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Abstract: **Identifying those cases of placenta Previa at high risk for preterm delivery would aid in counselling as well as delivery planning. Our objective was to identify risk factors for preterm delivery and placenta Previa. We searched PubMed, and MEDLINE for studies published up to August 2018, for all studies discussing preterm delivery and placenta Previa. Placenta previa refers to a placenta that overlies or is proximate to the internal os of the cervix and occurs in about 1 in 250 pregnancies. Although placenta previa classically presents as painless vaginal bleeding in the second or third trimester, the inclusion of routine second trimester ultrasound evaluation in standard prenatal care has led to more frequent identification of placenta previa in asymptomatic women. In the majority of cases the mechanism of such bleeding is unclear. Some investigators hypothesize that FTB may indicate an underlying placental dysfunction, manifesting later in pregnancy with adverse perinatal outcome.**

Keywords: **placenta Previa, asymptomatic women, pregnancy.**

1. INTRODUCTION

Placenta previa is observed in as many as 20% of transabdominal and 5% of transvaginal ultrasounds before 20 weeks gestational age [1], but the majority (approximately 90%) resolve by term [2]. Roughly one in 200 maternities are complicated by constant placenta previa at delivery, which is connected with medically suggested late-preterm and very early term delivery, increased threat of maternal intrapartum and postpartum hemorrhage, need for blood transfusion, sepsis, and hysterectomy [2]. Placenta previa is also associated with prematurity, low Apgar ratings and fetal, and neonatal death [1].

The precise etiology of placenta previa is unknown, but previous uterine surgical treatment, consisting of cesarean distribution (CD), is connected with a raised risk [1]. Uterine scaring has actually been recommended to disrupt the process of all-natural growth of the placenta at more vascular sites and degeneration of the placental attachment site in the comparatively less vascular low uterus. Damaged migratory function has actually been postulated to cause reduced likelihood of resolution of placenta previa before delivery [2]. Notably, the occurrence of placenta previa has actually been rising in parallel with the raising rate of cesarean delivery around the world. Cesarean delivery stitch kind and closure approach have actually been determined as modifiable features of the surgical procedure that may modify the risk of previa in subsequent maternities [2]. Similarly, labor may be an additional danger factor that could change previa risk related to prior cesarean delivery since intrapartum factors might affect uterine maintenance after cesarean distribution.

Identifying those cases of placenta previa at high risk for preterm delivery would aid in counselling as well as delivery planning. Our objective was to identify risk factors for preterm delivery and placenta previa.

2. METHODOLOGY

We searched PubMed, and MEDLINE for studies published up to August 2018, for all studies discussing preterm delivery and placenta Previa. We furthermore searched references list of included studies for more relevant articles which could support our study. We limited our search to only English language with human subjects.

3. DISCUSSION

- **Placenta Previa**

Placenta previa is an obstetric complexity that classically introduces as pain-free genital bleeding in the third trimester secondary to an abnormal placentation near or covering the internal cervical os [4]. Nonetheless, with the technologic breakthroughs in ultrasonography, the medical diagnosis of placenta previa is frequently made earlier in maternity. Historically, there have actually been three specified types of placenta previa: full, partial, and marginal. More lately, these interpretations have been consolidated into 2 definitions: complete and marginal previa.

A complete previa is defined as full coverage of the cervical os by the placenta. If the leading edge of the placenta is less than 2 cm from the inner os, however not completely covering, it is considered a marginal previa (see the following photo). As a result of the intrinsic risk of hemorrhage, placenta previa may result in considerable morbidity and mortality to both the unborn child and the mother.

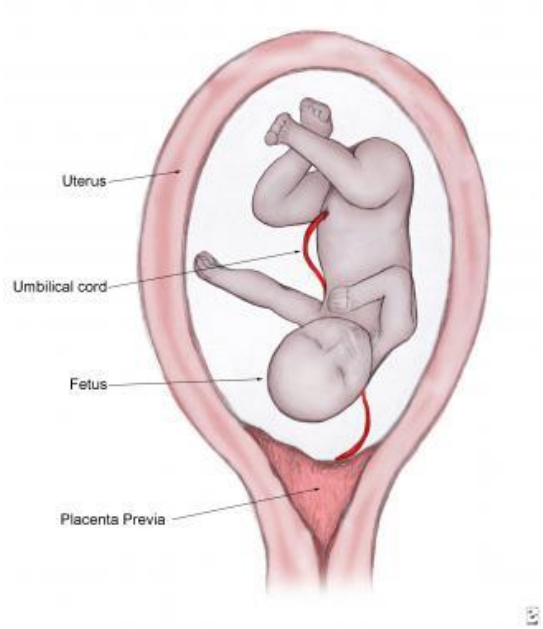

Figure 1: Placenta previa [3].

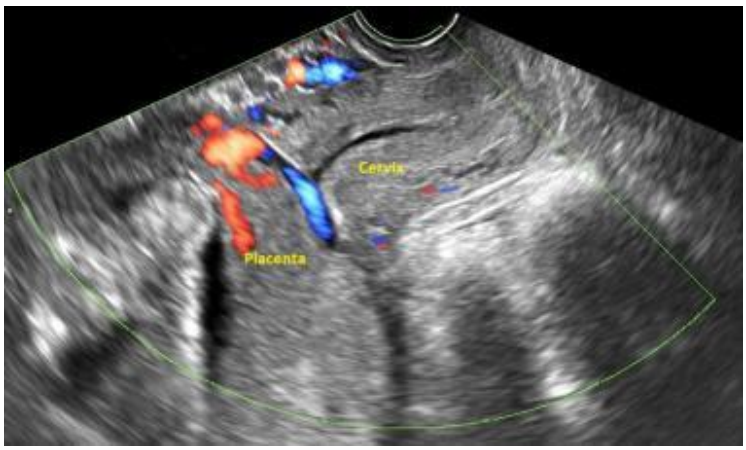

Figure 2.Complete placenta previa noted on ultrasound[3].

- **Pathophysiology**

Placental implantation is launched by the embryo (embryonic plate) adhering in the reduced (caudad) uterus. With placental attachment and expansion, the growing placenta may cover the cervical os. However, it is thought that a defective decidual vascularization happens over the cervix, possibly secondary to inflammatory or atrophic adjustments. Therefore, sections of the placenta having undergone atrophic modifications might persist as a vasa previa.

A leading reason for third-trimester hemorrhage, placenta previa offers classically as pain-free bleeding. Bleeding is thought to take place in association with the development of the lower uterine segment in the third trimester. Placental attachment is interrupted as this location gradually thins to prepare for the start of labor; this brings about bleeding at the implantation site, because the uterus is unable to contract adequately and stop the flow of blood from the open vessels. Thrombin release from the hemorrhaging sites promotes uterine tightening and causes a vicious circle of bleeding- contractions- placental splitting up- bleeding.

- **Etiology**

The precise etiology of placenta previa is unidentified. The condition might be multifactorial and is proposed to be associated with the following threat elements [4].

Hemorrhaging, if related to labor, would certainly be additional to cervical dilatation and disturbance of the placental implantation from the cervix and reduced uterine segment. As kept in mind previously, the lower uterine segment is inefficient in contracting and thus cannot tighten vessels as in the uterine corpus, causing continued bleeding [5].

Table 1: Risk factors of placenta previa[4],[5].

Advancing maternal age (>35 y)
Infertility treatment
Multiparity (5% in grand multiparous patients)
Multiple gestation
Short interpregnancy interval
Previous uterine surgery, uterine insult or injury
Previous cesarean delivery, including first subsequent pregnancy following a cesarean delivery
Previous or recurrent abortions
Previous placenta previa (4-8%)
Nonwhite ethnicity
Low socioeconomic status
Smoking
Cocaine use

- **Diagnosis of placenta previa**

Transvaginal sonography is currently well established as the favored method for the exact localization of a low-lying placenta. Sixty percent of women who undergo transabdominal sonography (TAS) may have a reclassification of placental position when they undergo TVS [6]. With TAS, there is poor visualization of the posterior placenta, the fetal head can disrupt the visualization of the reduced section, and obesity and underfilling or overfilling of the bladder also disrupt accuracy [6]. For these reasons, TAS is connected with an incorrect positive rate for the medical diagnosis of placenta previa of up to 25% [7]. Accuracy prices for TVS are high (sensitivity 87.5%, specificity 98.8%, positive predictive value 93.3%, negative anticipating value 97.6%), developing TVS as the gold criteria for the medical diagnosis of placenta previa [8]. The only randomized trial to date contrasting TVS and TAS verified that TVS is much more advantageous. 18 TVS has actually also been revealed to be risk-free in the presence of placenta previa, [8] even when there is established genital blood loss. Magnetic resonance imaging (MRI) will certainly also properly picture the placenta and is superior to TAS [9]. It is not likely that it provides any type of advantage over TVS for placental localization, but this has actually not been properly evaluated. Additionally, MRI is not easily offered in most units.

- **Prediction of placenta previa at delivery**

The occurrence of placenta previa is usual in the first half of pregnancy, and its perseverance to term will depend upon the gestational age and the interpretation used for the accurate relationship of the inner cervical os to the placental side on TVS [8]. In this guideline, the adhering to terms is recommended to define this relationship: when the placenta side does not get to the internal os, the distance is reported in millimetres away from the internal os; when the placental edge overlaps the internal os by any kind of quantity, the distance is described as millimetres of overlap. A placental edge that precisely reaches the inner os is defined by a measurement of 0 mm. For a placental side reaching or overlapping the internal os, Mustafa et al. [10] found in a longitudinal study an occurrence of 42% in between 11 and 14 weeks, 3.9% in

between 20 and 24 weeks, and 1.9% at term. With overlap of 23 mm in between 11 and 14 weeks, they approximated that the possibility of placenta previa at term was 8%. Similarly, Hill et al. [11] reported an occurrence of 6.2%for a placenta crossing the inner os in between 9 and 13 weeks. In their set of 1252 patients, 20 (1.6%) had overlap of the placental side of 16 mm or more, and just 4 of these had placenta previa persisting to term (0.3%). Two extra studies that have actually examined various distances of overlap in between 9 and 16 weeks [12], [13] agreed that persistence of placenta previa is incredibly not likely if the level of placental overlap is no more than 10 mm. Two studies checked out cut-off values at 18 to 23 weeks' gestation [14], [15]. These discovered a similar incidence of the placenta getting to or overlapping the internal os of approximately 2%, and on the whole less than 20% of these persisted as placenta previa. The chance of consistent placenta previa was successfully zero when the placental edge reached however did not overlap the os (0 mm) and increased considerably further than 15 mm overlap such that a distance of > 25 mm overlap had a probability of placenta previa at delivery of between 40% and 100%. The process of placental "movement" or relative higher change of the placenta due to differential growth of the reduced section is constant right into the late third trimester [15]. Of 26 patients scanned at approximately 29 weeks' gestational age when the placenta lay in between 20 mm far from the inner os and 20 mm of overlap, just 3 (11.5%) called for CS for placenta previa at shipment. A typical movement rate of > 1 mm per week was very anticipating of a typical result. An overlap of > 20 mm after 26 weeks was predictive of the requirement for CS [15] Predanic et al. [16] have ultimately released similar results. Transperineal or translabial ultrasound (utilizing a transabdominal probe) can likewise develop upon the diagnostic precision of TAS and may be a valuable alternative when TVS is not readily available [8].

- **Relation of Placenta Previa and Preterm delivery**

Placenta previa makes complex around 0.5% of all pregnancies [17]. Technologic breakthroughs in ultrasonography have increased the very early diagnosis of placenta previa, and numerous studies have shown that a substantial portion of these early diagnoses do not continue until distribution. Actually, 90% of all placentas marked as "reduced lying" on a very early sonogram are no more present on repeat examination in the third trimester [17].

Nevertheless, maternal and fetal complications of placenta previa are well recorded. Preterm birth is very associated with placenta previa, with 16.9% of females transporting at less than 34 weeks and 27.5% shipping between 34 and 37 weeks in a population-based research from 1989 to 1997 [2]. There is a substantial increase in the threat of postpartum hemorrhage and need for emergency hysterectomy in women with placenta previa [18].

Table 2: Maternal complication in placenta previa[17-19].

Hemorrhage, including rebleeding (Planning delivery and control of hemorrhage is critical in cases of placenta previa as well as placenta accreta, increta, and percreta.)
Higher rates of blood transfusion
Placental abruption
Preterm delivery
Increased incidence of postpartum endometritis
Mortality rate (2-3%); in the US, the maternal mortality rate is 0.03%, the great majority of which is related to uterine bleeding and the complication of disseminated intravascular coagulopathy

Table 3: Complications of placenta previa in the neonate/infant[19].

Congenital malformations
Fetal intrauterine growth retardation (IUGR)
Fetal anemia and Rh isoimmunization
Abnormal fetal presentation
Low birth weight (< 2500 g)
Neonatal respiratory distress syndrome
Jaundice
Admission to the neonatal intensive care unit (NICU)
Longer hospital stay
Increased risk for infant neurodevelopmental delay and sudden infant death syndrome (SIDS)
Neonatal mortality rate: As high as 1.2% in the United States

- **Risk of Preterm delivery in vaginal bleeding case**

Vaginal bleeding during pregnancy is always the source of stress and anxiety for the patient and the indicator of threatening abortion for the doctor. However, it was estimated that if a sensible fetus is described at ultrasound examination following genital bleeding, around 95% of such pregnancies will continue further than 20 weeks [20]. In spite of the fact that first trimester bleeding (FTB) is an usual difficulty of maternity, its system most of cases cannot be clarified and is inadequately comprehended. Gómez et al. [21] suggested that idiopathic vaginal blood loss might be the only manifestation of subclinical intrauterine infection, which they diagnosed in 14% of patients with such complication. There are also documents pertaining to biological theories that might clarify the relation in between vaginal blood loss and perinatal problems, specifically preterm delivery and placental pathologies. Esmon speculated that decidual thrombosis, ischemia, and necrosis might bring about genital blood loss, which consequently activates pro-inflammatory feedback and thrombin formation [20]. Thrombin itself is taken into consideration an uterotonic agent promoting spontaneous uterine contractions and also causing the cascade of proteolytic enzymes resulting in early rupture of membranes [21]. Weiss et al. [20] assumed that the disruption of chorionic-amniotic plane by hemorrhage could make the membrane layers a lot more vulnerable-- the larger the bleeding, the greater the vulnerability to fracture prematurely. The continuous existence of hemorrhage may also be a specific nutrient for intrauterine infection.

The writers are rather in agreement that short episodes of "light" bleeding in the 1st trimester might be normal and are probably connected to embryological events. Nonetheless, longer episodes of" heavier and more powerful" hemorrhaging could be indicative of maternity complications. It is, however, difficult to thoroughly record patterns of blood loss, especially in the early 1st trimester, before the patient gets to the obstetrician. One of one of the most current reports by Velez Edwards et al. [25] prospectively analyzed bleeding characteristics, such as the number of episodes, shade, heaviness, and duration. Their outcomes revealed that the threat of preterm birth was greater when bleeding episodes lasted beyond 3 days (aligned OR 1.67; 95% CI 1.17-2.38; P = 0.005), when bleeding was" red" not" brownish" (adjusted OR 1.92; 95% CI 1.32-2.82; P = 0.001) and when the episodes were" hefty" (adjusted OR 2.40; 95% CI 1.18- 4.88; P = 0.015). They also noticed that short, light, and" brownish" episodes of bleeding were not considerably related to preterm distribution. One of the weak points of the presented study is its retrospective character, which made it difficult to assess the patterns of bleeding in our study group (color, heaviness, and variety of episodes). We can only assume that solitary episodes of" light blood loss" or" spotting" could have been disregarded on anamnesis. Sun et al. [22] assessed that" hemorrhaging with seeing a doctor" was substantially associated with preterm birth with relative risk 1.84.

All released studies correspond that the risk of preterm birth as a whole boost around two times in maternities complicated by FTB. Saraswat et al. [23] performed a meta-analysis of 14 chosen researches concerning the risk of preterm birth and FTB- the general modified risk of transporting preterm was 2.05 (95% CI 1.76- 2.4), while the risk differed across researches from 1.5 to 4.5.

4. CONCLUSION

Placenta previa refers to a placenta that overlies or is proximate to the internal os of the cervix and occurs in about 1 in 250 pregnancies. Although placenta previa classically presents as painless vaginal bleeding in the second or third trimester, the inclusion of routine second trimester ultrasound evaluation in standard prenatal care has led to more frequent identification of placenta previa in asymptomatic women. In the majority of cases the mechanism of such bleeding is unclear. Some investigators hypothesize that FTB may indicate an underlying placental dysfunction, manifesting later in pregnancy with adverse perinatal outcome .

The results suggest that pregnancies experiencing FTB have a higher risk for adverse perinatal outcome, especially related to preterm delivery with all its complications. The knowledge about the outcome of FTB pregnancies is relevant when the antenatal surveillance and management of such pregnancies is planned. On the basis of current literature, such surveillance should include thorough screening for both preterm delivery and placental pathologies.

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