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RISK FACTORS ASSOCIATED WITH PLACENTA PREVIA IN PATIENT'S PRESENTED IN PUBLIC HOSPITAL OF LAHORE, PAKISTAN.

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Abstract

Background: *One organ that grows in the uterus during pregnancy is the placenta. The placenta attaches at the top or side of the uterus in the majority of pregnancies. The placenta attaches low in the uterus is placenta Previa. Placenta Previa occurs in about 1 in 200 pregnancies. There isn't a known cause of placenta Previa. There are some factors that can increase your risk of developing placenta Previa, including your medical history and certain lifestyle habits. There is a deficiency in knowledge of risk factor associated with placenta Previa that need to be strengthened. The exact cause that lead to placenta Previa are still not known. The reason behind this study is to gather data regarding associated factors with placenta Previa. For this purpose, the current study was undertaken to look over the risk factors with placenta Previa.*

Objective*: The objective of this study was to determine the risk factors associated with placenta Previa in patients presented in public hospital.*

Methodology*: A descriptive cross sectional design was utilized to conduct this study. Pregnant women with diagnosed placenta previa are the population of this study who presented in public hospital. This study was conducted in Lady Atchison Hospital, Lahore and Sample size 210. The duration of the study was 06 months from 1st July, 2024 to 31st Dec, 2024. The study sample was collected by the convenience sampling*

Results: *Risk factors of placenta previa included a prior caesarian section (51.4%); D & C (51.4%); multiple parities (68.1%); maternal age of greater than 30 years (66.7%), smoking (15.2%) or working (45.7%) during pregnancy.*

Conclusion: *In conclusion, this study provides suggestive evidence about advanced maternal age, previous cesarean sections, smoking, and infertility therapies, frequency of births complicated by placenta previa as risk factors associated with placenta previa. To lessen the related difficulties, careful monitoring of these risk factors is advised along with prompt delivery.*

INTRODUCTION

CHAPTER 1:

Placenta Previa occurs in about 1 in 200 pregnancies. Pregnancy care providers usually diagnose it in the second trimester during an ultrasound. One organ that grows in the uterus during pregnancy is the placenta. The placenta attaches at the top or side of the uterus in the majority of pregnancies. The placenta attaches low in the uterus in placenta Previa. The cervix, the opening of the uterus, may be entirely or partially covered by the placenta. The woman may experience heavy bleeding prior to, during, or following birth due to placenta Previa (Lockwood CJ et al., 2022).

During pregnancy, an organ called the placenta grows inside the uterus. It functions to eliminate waste and give the infant oxygen and nourishment. Through the umbilical cord, the placenta attaches itself to your child. The placenta is usually affixed to the side or upper portion of the uterine wall (Resnik R et al., 2022).

The placenta attaches lower in the uterus when placenta Previa occurs. As a result, the cervix is partially covered by placental tissue. Bleeding may occur during pregnancy or during or following delivery (Silver RM, 2022).

Pregnancy-related changes to the uterus and placenta may cause the issue to resolve itself.

If not, a cesarean section (C-section) is performed to deliver the baby (Venu Jain et al., 2020).

There isn't a known cause of placenta Previa. There are some factors that can increase your risk of developing placenta Previa, including your medical history and certain lifestyle habits. Risk Factors for Placenta Previa is more common among women who; have had a baby, have had a previous C-section delivery, have scars on the uterus from a previous surgery or procedure, had placenta Previa with a previous pregnancy, are pregnant after having an assisted reproductive technology (ART) procedure for treating infertility, are carrying more than one fetus, are age 35 or older, smoke, and use cocaine (Jnabei E et al., 2021).

There are several types of placenta Previa: Marginal placenta Previa: The placenta is positioned at the edge of your cervix. It's touching your cervix, but not covering it. This type of placenta

Previa is more likely to resolve on its own before your baby's due date. Partial placenta Previa: The placenta partially covers your cervix. Complete or total placenta Previa: The placenta is completely covering your cervix, blocking your vagina. This type of placenta Previa is less likely to correct itself (Long, S. Y et al, 2021).

Problem Statement:

Placenta previa is a leading cause of antenatal and post-natal complications, which can lead to increase in maternal mortality. Majority of the females with placenta previa lack knowledge of risk factor associated with placenta Previa that need to be strengthened. The exact cause that lead to placenta Previa are still not known. There is also a communication gap in healthcare personnel and patient, and lack of awareness among patients regarding factors that may cause such condition. The reason behind this study was to gather data regarding associated factors with placenta Previa. For this purpose, the current study will be undertaken to look over the risk factors with placenta Previa.

Significance of the study:

This study will be helpful for researcher to know that are what factors that may lead to placenta Previa and how to control such factors. It will be a source of information for me to know about how these factors affect the health. This study will also be helpful for the medical personnel that they should assess their own knowledge about risk factors that can cause placenta Previa and how it will affect the prognosis, and how to prevent from further health problems, and to educate the patients to overcome these factors while staying in clinical areas and at home.

Objective of the study:

The objective of this study was to determine the risk factors associated with placenta Previa in patients presented in public hospital.

KEY TERMS DEFINITIONS:

Placenta Previa

A pregnancy condition known as placenta Previa occurs when the placenta develops in the uterus, the lowest region of the womb, and covers all or part of the cervix's opening. The developing baby is fed by the placenta, which expands during pregnancy. The birth canal's entrance is called the cervix.

Risk Factors

Risk factors are characteristics at the biological, psychological, family, community, or cultural level that precede and are associated with a higher likelihood of placenta Previa. Protective factors are characteristics associated with a lower likelihood of placenta Previa or that reduce a risk factor's impact.

CHAPTER 2: LITERATURE REVIEW

Literature was searched via PubMed, Research Gate, CINAHL, NICB and Google Scholar. Filters were applied and recent studies were reviewed. Minimum 15 recent articles were reviewed. A study was conducted with the objective of risk factor associated of placenta previa. Placenta previa is an obstetric complication with a prevalence of 5.2 per 1000 pregnancies (Jnabei E et al., 2021).

Another study was conducted in Sree Ballaji College of nursing India in 2023. Study showed that Placenta Previa affects 0.3% to 2% of pregnancies in the third trimester. Placenta Previa is the complete or partial covering of the cervix. Marginal Placenta Previa is where the edge of placenta is within 2cm of the internal os. Nearly 90% of placentas identified as "low lying" which can be resolve by the third trimester due to migration of placenta. With the diagnosis of placenta previa, the patient is prepared for elective delivery at 36 to 37 weeks via cesarean section. (Hemavathy et al., 2023). Moreover, a study was conducted in USA with the objective was to determine maternal characteristics associated with the persistent Placenta Previa. Maternal risk factors include advanced maternal age (AMA), history of stillbirth, history of cesarean delivery, history of dilatation and evacuation (D&E), gravidity, tobacco use, and substance abuse. Most cases of previa are diagnosed in the second trimester; of these, 90–95% resolve by the third trimester.(King, L. J. K., et al. (2020)

This study was conducted nationally in Nassau University Medical Center and NYU Langone-Brooklyn 2023 with the objective of risk factor of placenta Previa and pathophysiology of placenta Previa. A history of advanced maternal age (more than 35 years old), multiparty, smoking, curettage hi, cocaine usage, and cesarean section history are risk factors for placenta previa. Higher parity and uterine surgeries or reproductive treatment may complicate the association between advanced maternal age and placenta Previa. Cigarette smoke contains nicotine and carbon monoxide, which are strong vasoconstrictors of placental arteries. This impairs placental blood flow and causes improper placentation. (Anderson-Bagga, F. M., & Sze, A. (2023)

The study was conducted in Bogomolets National see University, Kyiv, Ukraine. The objective of the study was to determine the effect of obstetric-gynecological factors on the prediction of placenta Previa occurrence and its influence on perinatal outcomes. Placenta Previa occurs in 0.3–1.5% of pregnancies, which leading to severe maternal morbidity and mortality. Placenta Previa diagnosed via sonography, while others may have presented as asymptomatic vaginal bleeding during the second or third trimester of pregnancy. Placenta Previa is associated with unfavorable neonatal outcomes, including preterm birth, low birth weight, and perinatal mortality Understanding the effect of obstetric-gynecological history on the occurrence of PP is important for providing appropriate counseling to pregnant women (Berestovyi et al., 2023).

The study was conducted with the objective of Maternal and Neonatal Outcomes Resulting from Antepartum Hemorrhage in Women with Placenta Previa and Its Associated Risk Factors: Antepartum hemorrhage (APH), remains as an important cause of perinatal mortality and maternal morbidity worldwide. In addition to

maternal morbidity secondary to acute hemorrhage and operative delivery, the fetus may be compromised by utero placental insufficiency, premature birth and perinatal death. (Long, S.-Y. et al., 2021). One study showed that women with Placenta Previa who were under 30 years old and who had a history of vaginal delivery may be at significant risk of experiencing APH (Kuribayashi et al., 2021).

Another cross sectional study was carried out at a Teaching Hospital of Sialkot, 2021with the objective of to determine the frequency of placenta Previa among women with previous cesarean-sections. The papulation sample size was 147 pregnant females have a history of cesarean section. Among those, 16.3% had placenta Previa, which increased significantly in women with >2 previous cesarean sections to 26.4%. Regarding parity, the increase in the risk of placenta Previa was not significant. Previous cesarean sections strongly correlate with placenta Previa in subsequent pregnancies. Such findings need close monitoring and proactive measures, especially in cases of multiple cesarean deliveries, in the management of associated complications (Maqsood et al., 2024)

The diagnosis of placenta Previa, such as major, minor, marginal, and low-lying, their origin being related to the historical diagnosis of placenta Previa made by ultrasound with the inability of these terms to communicate the exact relationship of the placenta/placental edge to the cervical os (and to the location of the uterine incision in cases of cesarean delivery). The need of antenatal for woman with a provisional or definitive diagnosis of placenta previa, several factors must be considered, including gestational age, placental localization, history of antepartum hemorrhage, symptoms of preterm labor, cervical length, parity, history of cesarean delivery or prior uterine surgery, and geographical location of the patient relative to an appropriate delivery unit (Jain et al., 2020)

A study was conducted by Ronan MD Maternal-Fetal Medicine Specialist showed that Preterm birth is highly associated with placenta previa, with 16.9% of women delivering at less than 34 weeks and 27.5% delivering between 34 and 37 weeks in a population-based study from 1989 to 1997. A study showed that pooled proportions for the risk of preterm birth before 37, 34, 32 and 28 weeks of gestation in pregnant persons with placenta previa were 46%, 17%, 10%, and 2%, respectively. There is a significant increase in the risk of postpartum hemorrhage and need for emergency hysterectomy in women with placenta Previa. Complications of placenta previa in the neonate/infant are; Congenital malformations, Fetal intrauterine growth retardation (IUGR), Fetal anemia and Rh iso-immunization, 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. Patients with placenta previa should decrease activity. In addition, pelvic examinations and intercourse should be avoided. Counsel patients with placenta previa about the risk of recurrence. Instruct them to notify the obstetrician caring for their next pregnancy about their history of placenta previa. Encourage patients with known placenta previa to maintain intake of iron and folate as a safety margin in the event of bleeding. (Bakker, 2024).

CHAPTER 3: MATERIAL AND METHODS

Study Design:

A descriptive cross sectional design was utilized to conduct this study.

Study Population:

Population of pregnant patients with placenta previa who present in public hospital.

Study Setting:

This study was conducted in Lady Atchison Hospital, Lahore.

Duration:

The duration of the study was 06 months from 1st July, 2024 to 31st Dec, 2024

Sample Size:
The sample size was determined using with unknown Population: Dobson formula
$n = Z^2 P(1-P) d2$
q=1-p n = (1.96)2 0.2(1-0.2/ (0.05)2
n =210
Where
n = Sample size
Z=Z statistic for level of confidence
P=Expected prevalence or proportion (if the expected Prevalence is 20% then p=0.2)
D= precision (if the precision is 5% then d=0.05)

Sample Technique:
Sampling technique is a way of selecting participant from the target population and selecting the subjects to be the part of the research. The study sample was followed by the convenience sampling.

Sample Selection Criteria:

Inclusion Criteria:
Pregnant women presented in public hospital (Lady Aitchison Hospital)
- Diagnosed with placenta Previa.
- Age 18-45

Exclusion criteria:
- Patients who have placenta previa with other diseases like GDM, Hypertension.
- Patient wo has missing medical history

Data Collection Procedure:
After ethical approval from Research Committee, 210 patients in public hospital were be involved in the study. Participants will be provided with enough information and the purpose of study were explained in order to gain full consent. This will be achieved through a letter of consent attached to each questionnaire starting the basis of the research, duration of the participation, confidentiality as well as benefits.

Data Collection Tool:
Risk Factors associated with placenta Previa (See Appendix), developed for this study is a 16-item questionnaire and will be used to collect data measuring risk factors associated with placenta Previa. Each statement has a close ended answer from YES and NO. The questions are developed through the identification of emerging themes, recommendations from experts, and from nursing diagnoses related to the assessment, interventions, and evaluation of placenta Previa and risk factors.

Ethical Considerations:
- The study was guided by the ethical principles of World Medical Association (WMA) declaration of Helsinki.
- Privacy and confidentiality of participants was ensured.
- Voluntary written informed consent for induction was taken prior to data collection. The study was approved by the Institutional Ethical Review Committee of FMH system
- Any harm to the participants was avoided.

Data Analysis:
Data was analyzed using SPSS Statistics 23. Data will be analyzed by using descriptive statistics to check mean, standard deviation, frequency and percentages.

CHAPTER 4: RESULTS
This study is conducted at tertiary care hospital to assess Factors associated with placenta previa. The result of this study is distributed into two sections, first section is statistics of demographic data of participants presented in hospital and second is frequency and statistics of questionnaire items regarding factors associated with placenta previa.

Section A
Table 1, shows the frequency, percentage, mean, median, mode and standard deviation of demographics that includes age, education level, profession, gestational age, no. pf working hours and gravidity of the participants presented in hospital. The given results provide insights into various demographic variables related to a particular population.

Table 01: Demographic Characteristics/Statistics

Demographic Variable	Description	Frequency	Percentage	Mean	Std. Deviation
Age	21-25	05	2.4%	2.6429	0.52777
	26-30	65	31%		
	Above 30	140	66.7%		
	Total	**210**	**100%**		
Education Level	Matric	21	10%	3.0952	1.14936
	Intermediate	53	25.2%		
	Bachelor	34	16.2%		
	Master	89	42.4%		
	Above	13	6.2%		
	Total	**210**	**100%**		
Profession	Working	96	45.7%	1.5286	0.62763
	Housewife	114	54.3%		
	Total	**210**	**100%**		
Gestational Age	10-16	07	3.3%	2.9238	1.05988
	17-20	77	36.7%		
	21-26	79	37.6%		
	27-30	19	09%		
	>30	28	13.3%		
	Total	**210**	**100%**		
No. of working hours	04 hours	05	2.4%	2.8714	0.76255
	06 hours	52	24.8%		
	08 hours	127	60.5%		
	10 hours	26	12.4%		
	Total	**210**	**100%**		
Gravidity	Primigravida	48	22.9%	2.1762	0.83718
	Gravida 02	87	41.4%		
	Gravida 03	65	31%		
	Gravida 04	10	4.8%		
	Total	**210**	**100%**		

Section B

Table 02 consists of questionnaire regarding the factors associated with placenta previa. The table presents a list of 15 items that are to be questioned during data collection. The percentage (%) of each item are provided for two categories (Yes, No). These categories indicate the presence and absence.

More than half (54.3%) of the population studied did not have a history of uterine fibroids. The women (45.7%) had a history of fibroid uterus. The statistical information about surgical site infections among women A notable percentage of women developed surgical site infection. (18.1%) and 81.9% without infection: The majority of women did not develop surgical site infections. This data provides insight into the incidence of surgical site infections in the studied population.

A few of women had (15.2%) history of smoking. The majority of women did not have a history of smoking and 84.8% without smoking history. The history of fibroid uterus in a particular study or

population was 54.3% without fibroids. A majority of the population had anemia. (61.9%) and few (38.1) had good hemoglobin levels. This data suggests that anemia was a significant issue in the studied population.

Among the women 15.7% reported prior hospitalization and 84.3% did not while 3.8% women had history of pre term ruptured of membrane and 96.2% had no any history of pre term ruptured of membrane. The surgical site infection rate was 18.1% while 81.9% of cases being infection free.

Approximately 26.7% of women had undergone uterine exploration while 73.3% of women had not undergone uterine exploration.

Few women (15.7%) reported prior hospitalization while majority (84.3%) having no history of prior hospitalization. The prevalence of D&E history among women was 16.2%, with 83.8% having no such history. Among the women, 68.1% reported having given birth to a live baby, while others (31.9%) reported no live births. Among the women, few (3.8%) had experienced preterm rupture of membranes, and 96.2% had not. The prevalence of C-section history was 51.4%, with 48.6% of women having no prior C-sections.

Table 02: Statistics of Risk Associated with Placenta Previa

Sr. No	Factor	Yes %	No %	Mean	Std. Deviation
1.	Parity? Do you have alive baby?	68.1%	31.9%	2.1762	0.83718
2.	Do you have any previous history of placenta previa?	9.0%	91%	2.9238	1.05988
3.	Do you have history of Cesarian section?	51.4%	48.6%	0.5143	0.50099
4.	Do you have history of D & C?	51.4%	48.6%	0.2667	0.44327
5.	Do you have history of D & E?	16.2%	83.8%	0.1619	0.36924
6.	Do you have history of Manual Removal of Placenta?	11.4%	88.6%	0.1143	0.31892
7.	Any history of Uterine exploration?	26.7%	73.3%	0.2667	0.44327
8.	History of Fibroids?	45.7%	54.3%	0.4571	0.49935
9.	Any Premature birth?	30.5%	69.5%	0.3048	0.46141
10.	Do you smoke or have history of smoking?	15.2%	84.8%	0.1524	0.36025
11.	Do you have any history of surgical site infection	18.1%	81.9%	0.1810	0.38590
12.	Do you have history of anaemia?	61.9%	38.1%	0.6190	0.48678
13.	Do you have any history of blood transfusion?	14.3%	85.7%	0.1429	0.35076
14.	Do you have any history of hospitalisation?	15.7%	84.3%	0.1571	0.36481
15.	Do you have previous history of preterm ruptured of membrane?	3.8%	96.2%	0.381	0.19188

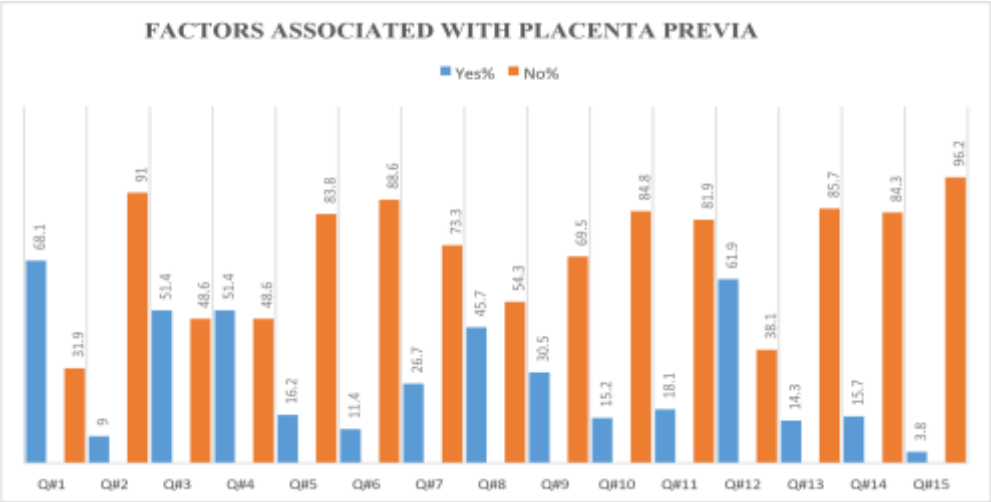

Figure 01 shows the cumulative results of factors associated with placenta previa.
Above figure shows the cumulative results of factors associated with placenta previa. The graph shows the percentage of all the items in questionnaire.

CHAPTER 5: DISCUSSION

This study was conducted at public (tertiary care) hospital in Lahore. The study looked carefully into the relationship between each possible risk factor and placenta previa. The current study's results support those of the majority of earlier research, which found that the likelihood of placenta previa rises with maternal age and the frequency of induced abortions increase. The consequences of repeated pregnancies and uterine aging are thought to be the origin of the relationship between maternal age and placenta previa risk (Ananth et al, 2021).

Additionally, vacuum aspiration or dilatation and curettage may result in adhesions and scarring in the uterus that hinder effective placentation in subsequent pregnancies. Women might be putting off having children. The results of this study are clinically significant even if the patient records did not include information about abortion procedures. Despite the fact that women may be postponing having children (Mathews.et al, 2022). Over one-third of those who choose to terminate their pregnancies plan to have children in the future. The use of reproductive technology has been reported to be associated with adverse pregnancy outcomes, including abnormalities in the location and function of the placenta (Jackson et al., 2024).

The aberrant placentation was believed to be caused by an intrinsic change in the placenta's nature when the chorion's development is started in vitro. The current analysis provides more evidence to corroborate the findings of two recent studies that found the probability of placenta previa was 3.6–6.0 times higher after using in vitro fertilization than in pregnancies without the use of assisted reproductive technologies (Shevell et al., 2020).

The physiological mechanisms behind these relationships are still unknown, despite the current study's finding that working during pregnancy and previous preterm delivery were significantly related with placenta previa. Women who experience physical or psychological stress may be more likely to have placental implantation in the lower uterine segment or to have a lower chance of placenta previa resolution as the pregnancy progresses. To confirm these results, more research is required.

According to current study's findings, it's critical to identify the obstetric characteristics that predispose women in our demographic to develop placenta previa in order to select appropriate preventative treatments for them. If a woman is over 30, has had three or more pregnancies, has two or more parities, and has a

growing number of prior abortions and cesarean sections, patient should be considered at risk of placenta previa.(Anderson-Bagga, F. M., & Sze, A. (2023) . counseling for these women should begin as soon as the pregnancy is confirmed. This is particularly crucial for noncompliant women who may have received subpar prenatal care. It is crucial to closely monitor these high-risk pregnancies, particularly with regard to precise placental placement during the second trimester of pregnancy and rigorous ultra-sonographic evaluation. Early recognition and proper monitoring of placenta previa could minimize the possibility of poor outcome in sudden massive vaginal bleeding. (Bakker, 2024).

Outcomes and Utilizations:

The results of the present study would be useful in:

- Enhancing the knowledge regarding factors that can lead to placenta previa.
- Early recognition and proper monitoring of placenta previa in order to minimize the risk factors associated with placenta previa.

Recommendation

The following recommendations are suggested on the basis of findings of the study;

- To lessen the related difficulties, careful monitoring of these risk factors is advised along with prompt delivery.
- Counseling for women at risk of placenta previa should begin as soon as the pregnancy is confirmed.
- Early recognition and proper monitoring of placenta previa in order to minimize the possibility of poor outcome in sudden massive vaginal bleeding.
- Physical or psychological stress are one of the causes of placenta previa. Women in pregnancy should avoid stress causing factors.

It is suggested from this study that during pregnancy, antenatal checkup should be done regularly so as to screen the risk factors antecedently so to avoid disastrous effects of placenta previa.

Implications for future researches

Further research is needed to understand the specific mechanism by which r=these risk factors increase the risk of placenta previa, particularly the link between advanced maternal age, smoking, previous cesarean section, and uterine fibroids.

Limitations

There are several limitations to this study. First, the study findings might not be generalizable because samples collected only from one Public Sector hospital in Lahore. Second, it has the attendant limitation of a hospital-based study, i.e., the risk factors for placenta previa in an Asian population bias due to both over diagnosis and underdiagnoses. The third drawback is the limited sample size for several crucial variables, such "prior placenta previa" and "more than three cesarean deliveries."

Conclusion

In conclusion, this study provides suggestive evidence about advanced maternal age, previous cesarean sections, smoking, and infertility therapies, frequency of births complicated by placenta previa as risk factors associated with placenta previa. To lessen the related difficulties, careful monitoring of these risk factors is advised along with prompt delivery.

REFERENCES

Jenabi, E., Salimi, Z., Bashirian, S., Khazaei, S., & Ayubi, E. (2022). The risk factors associated with placenta previa: An umbrella review. Placenta, 117, 21-27.

Resnik R, et al., eds. Placenta previa and accreta, vasa previa, subchorionic hemorrhage, and abruptio placentae. In: Creasy and Resnik's Maternal-Fetal Medicine: Principles and Practice. 8th ed. Elsevier; 2019. https://www.clinicalkey.com. Accessed Feb. 16, 2022.

Lockwood CJ, et al. Placenta previa: Epidemiology, clinical features, diagnosis, morbidity and mortality.

https://www.uptodate.com/contents/search. Accessed Feb. 16, 2022.

Lockwood CJ, et al. Placenta previa: Management. https://www.uptodate.com/contents/search.Accessed Feb. 16, 2022.

Placenta previa. Merck Manual ProfessionalVersion.https://www.merckmanuals.com/professional/gynecology-and-obstetrics/abnormalities-ofpregnancy/placenta-previa. Accessed Feb. 16, 2022.

American College of Obstetricians and Gynecolgists. Bleeding during pregnancy (https://www.acog.org/patient-resources/faqs/pregnancy/bleeding-during-pregnancy). Accessed 9/26/2022.

American Journal of Obstetrics & Gynecology. Society for Maternal-Fetal Medicine (SMFM) Consult Series #44: Management of bleeding in the late preterm period

(https://www.ajog.org/article/S0002-9378(17%2931212-7/pdf). Accessed 9/26/2022.

Ananth CV, Wilcox AJ, Savitz DA, Bowes Jr WA, Luther ER. Effect of maternal age and parity on the risk of uteroplacental bleeding disorders in pregnancy. Obstet Gynecol 2021;88: 511–6.

March of Dimes. Placenta previa (https://www.marchofdimes.org/complications/placentaprevia.aspx). Accessed 9/26/2022.

Merck Manual. Vasa Previa (https://www.merckmanuals.com/home/women-shealthissues/complications-of-pregnancy/vasa-previa). Accessed 9/26/2022.

Silver RM. Abnormal Placentation: Placenta Previa, Vasa Previa, and Placenta Accreta (https://pubmed.ncbi.nlm.nih.gov/26244528/). Obstet Gynecol. 2015 Sep;126(3):654668. Accessed 9/26/2022.

Venu Jain., Hayley Bos., & Emmanuel Bujold Diagnosis and Management of Placenta.Available online 23 June 2020, Version of Record 23 June 2020.

Long, S. Y., Yang, Q., Chi, R., Luo, L., Xiong, X., & Chen, Z. Q. (2021). Maternal and Neonatal

Outcomes Resulting from Antepartum Hemorrhage in Women with Placenta Previa and Its

Associated Risk Factors: A Single-Center Retrospective Study. Therapeutics and Clinical Risk Management, 17, 31–38. https://doi.org/10.2147/TCRM.S288461

Mathews TJ, Hamilton BE. Mean age of mother, 1970–2000. Natl Vital Stat Rep 2022;51:1–13.

Jackson RA, Gibson KA, Wu YW, Croughan MS. Perinatal outcomes in singletons following in vitro fertilization: a metaanalysis. Obstet Gynecol 2024;103:551–63.

[20] Shevell T, Malone FD, Vidaver J, Porter TF, Luthy DA, Comstock CH, et al. Assisted reproductive technology and pregnancy outcome. Obstet Gynecol 2020;106:1039–45.