



Relationship between History of Caesarean Section Delivery and Placenta Previa: A Literature Review

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ABSTRACT

Complications during pregnancy and childbirth in the form of bleeding are the main cause of maternal mortality. One case of bleeding is placenta previa. The cause of placenta previa has not been explained, but the occurrence of placenta previa is often associated with a history of cesarean delivery. The purpose of writing this article is to compare the results of research that has been done with theories related to the relationship between cesarean section delivery and the occurrence of placenta previa. This article is a literature review in the form of literature compiled by utilizing secondary data from various publications related to the relationship between a history of cesarean delivery and the occurrence of placenta previa. The results of several studies show a strong correlation between a history of cesarean section and the occurrence of placenta previa in subsequent pregnancies, but one study found no correlation between a history of cesarean section and placenta previa. The theory explains that fibroid tissue from uterine wall wounds created during cesarean section affects the vascularization of placental implantation. Another theory also states that women who have undergone two or more cesarean sections are at higher risk of experiencing placenta previa. This literature can be used as a consideration regarding the importance of choosing delivery in pregnant women according to indications because cesarean delivery can be a risk factor for placenta previa in subsequent pregnancies, which can affect maternal mortality rates.

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INTRODUCTION

The level of health welfare of a country is determined by the Maternal Mortality Rate (MMR), MMR is an indicator to see the level of women's welfare, where MMR shows the capacity and quality of health services, the quality of public education, the availability of health facilities and infrastructure, social, cultural, and access to health services

available in a country (WHO, 2025). Maternal Mortality Rate can be observed from women who die from causes of death related to pregnancy, childbirth, and postpartum without taking into account the duration of pregnancy (Sari, Hastati and Pasaribu, 2024).

The maternal mortality rate is still very high. In 2023, almost 260,000 women will lose their lives during, after pregnancy and at the time of childbirth. Low- and lower-middle-income countries account for about 92% of all maternal deaths. The most significant reduction in the lifetime chance of maternal death during this period occurred in the Central and South Asia region, with the risk decreasing by 83% from 1 in 71 in 2000 to 1 in 410 in 2023 (WHO, 2025). Indonesia still has a high maternal mortality rate, according to the Ministry of Health in 2022 the MMR reached 189 deaths per 100,000 live births, while according to 2020 data the total number of MMR reached 4,627 people. (Kementrian Kesehatan Republik Indonesia, 2023), (Kementrian Kesehatan Republik Indonesia, 2020).

Complications during pregnancy and childbirth are the leading cause of maternal mortality. Most of these problems arise during pregnancy and can be avoided or treated, but pregnancy can worsen pre-existing problems, especially if left untreated (WHO, 2025). Maternal mortality is most often caused by bleeding at 30%, eclampsia at 25%, infection during pregnancy at 12%, abortion at 5%, obstructed labor at 5% and other causes of death at 23% (Simanjuntak, 2021).

Pregnancy-related problems and increased mortality are caused by antepartum hemorrhage, or bleeding that occurs after 24 weeks. Placenta previa and placental abruption are the most common disorders that result in antepartum hemorrhage and become emergencies (Royal College of Obstetricians and Gynaecologist, 2021). Placenta previa is a condition where the placenta is implanted in the lower uterine segment, where the position of the implantation can cover all or part of the cervix (Crum et al, 2019).

The incidence of placenta previa is quite high, in 1000 pregnancies there are 5.2 cases of pregnant women with placenta previa. The Asian continent ranks highest in the incidence of placenta previa with 12.2 women experiencing placenta previa out of 1000 pregnancies, followed by the European continent with an incidence of 3.6 out of 1000 pregnancies. The incidence of placenta previa in Indonesia is quite high, reaching around 2.4-3.56 out of 1000 pregnancies (Syafitri and Suwandi, 2020), (Cresswell, 2013).

The causes or risk factors for placenta previa have not been explained in detail, but it can be assumed that the incidence of placenta previa is often associated with a history of childbirth by cesarean section. Along with the development of technology and methods in solving health problems, especially in terms of reducing maternal mortality, a surgical delivery method known as cesarean section has been discovered. Delivery by cesarean section is a surgical incision in the abdominal wall and uterus with the aim of removing the baby (Crum and et al, 2019). The theory explains that the incision in the uterine wall during the cesarean section process causes atrophy and reduced vascularization so that the lower segment of the uterus becomes a place rich in vascularization for placental implantation and causes placenta previa (Podungge *et al.*, 2023). This literature aims to compare research that has been done with the theory of the occurrence of placenta previa



METHOD

This article is a literature review, which is a literature review compiled by utilizing secondary data from various publications published in domestic and foreign journals. Scientific sources taken with the keywords "placenta previa" and "caesarean operation" are then reviewed using a systematic literature review approach, which includes the collection, assessment, and development of research with a specific focus. The literature review provides an overview of the most relevant articles, then compiled into an article.

RESULT

The results of the study based on 13 selected journals have been presented in detail in Table 1 below.

Table1. Result Review 13 Journal selected

No	Title	Method	Result
1.	Analysis of Factors Associated with the Incidence of Placenta Previa (Mursalim, Nurdin and Sari, 2019).	Survey and Observation	There was a relationship between a history of caesarean section and the age of the pregnant mother with the occurrence of placenta previa and there was no relationship between parity and history of twins with the occurrence of placenta previa.
2.	Factors Associated with the Occurrence of Placenta Previa (Wahyu <i>et al.</i> , 2019).	Survey and Observation	There is a significant relationship between the risk factors of maternal age, history of caesarean section, parity, history of curettage and pregnancy interval with the incidence of placenta previa.
3.	Factors related to placenta previa at H. Adam Malik General Hospital Medan in 2018(Syafitri and Suwandi, 2020).	Survey and Observation	There is a relationship between birth history, abortion history and maternal age with the incidence of placenta previa
4.	Previous prelabor or intrapartum cesarean delivery and risk of placenta previa (Downes <i>et al.</i> , 2015).	Retrospective Cohort	Caesarean delivery is significantly associated with the occurrence of placenta previa and the risk of placenta previa is 2 times greater in mothers with a history of caesarean delivery.
5.	The Relationship between Childbirth History and the Rate of Placenta Previa in	Survey And Observation	There is a relationship between the history of childbirth and the occurrence of placenta previa,

	Mothers Giving Birth at Budi Kemulian Hospital for the 2019-2022 Period (Martinus, Purwati and Firlya, 2024).		with the risk of this case being three times higher in caesarean section deliveries.
6.	The relationship between a history of caesarean section and a history of placenta previa in a previous pregnancy with the occurrence of placenta previa (Trianingsih, 2012).	Survey And Observation	There is a significant relationship between a history of caesarean section delivery and a history of previous placenta previa with the incidence of placenta previa.
7.	Relationship Between History of Curettage and History of Sectio Caesarea with Placenta Previa at Abdoel Wahab Sjahranie Hospital Samarinda 2020-2022 Period (Sari, Hastati and Pasaribu, 2024).	Survey and Observation	There is a relationship between patients who have a history of cesarean section and the occurrence of placenta previa and there is a relationship between patients who have a history of curettage and the occurrence of placenta previa.
8.	Maternal risk factors associated with persistent placenta previa (King <i>et al.</i> , 2020).	Retrospective Cohort	There is a relationship between caesarean section delivery and the incidence of placenta previa with a risk factor 7 times higher compared to women without a history of caesarean section delivery.
9.	Relationship between Placenta Previa and Previous Pregnancy History (Husain, Wagey and Suparman, 2020)	Cross Sectional	There is a relationship between the incidence of placenta previa and maternal age and multiparity, but there is no relationship between a history of caesarean section and a history of curettage and the incidence of placenta previa.
10	Abnormally invasive placenta-prevalence, risk factors and antenatal suspicion: results from a large population-based pregnancy cohort study in the Nordic countries (Thurn <i>et al.</i> , 2016).	Retrospective Cohort	Many cases of abnormal invasive placenta are caused by placenta previa with the risk of abnormal invasive placenta increasing 7 times after one previous cesarean delivery
11.	Risk factors for placenta accreta: a large prospective	Prospective Cohort	Patients with placenta previa have an increased risk of accreta with the number of previous cesarean deliveries and no other maternal



	cohort (Bowman <i>et al.</i> , 2014).		characteristics were found to be associated with the incidence of accreta.
12.	Incidence and risk factors for placenta accreta/increta/percreta in the UK: a national case-control study (Fitzpatrick <i>et al.</i> , 2012).	Case control	Women who have had a previous cesarean delivery and a history of placenta previa have a high incidence of placenta accreta.
13.	The Relationship between History of Curettage and Caesarean Section Operation with the Incident of Placenta Previa at Prabumulih City Hospital (Anggriani, 2022).	Cross Sectional	There is a significant relationship between a history of caesarean section delivery and the incidence of placenta previa and there is a significant relationship between a history of curettage and the incidence of placenta previa.

DISCUSSION

Placenta previa is an abnormality in which the placenta is located near or covers the ostium cervix during pregnancy (Jing *et al.*, 2018). According to Adersen, placenta previa is defined as partial or complete closure of the internal organs of the cervix by the placenta which is a significant risk factor for bleeding during pregnancy and because of this abnormal position it can be a contraindication for vaginal delivery (Anderson-Bagga and Sze, 2025). This definition can be concluded that placenta previa is an abnormality of placental implantation in the uterus which can cover part or all of the ostium cervix and can manifest clinically in the form of bleeding during pregnancy.

Ultrasonography (USG) examination in the second and third trimesters can be a clear modality to identify the occurrence of placenta previa as early as possible. In general, the position of placenta previa is divided into several types. Total placenta previa, namely the placenta covers the entire internal ostium of the uterus. Partial placenta previa, namely the condition of the placenta covering part or to a certain degree the internal ostium of the uterus. Marginal placenta previa, namely the condition of the placenta whose edge is within 2 cm of the uterine ostium. While low-lying placenta previa is a condition where the edge of the placenta is 2 to 3.5 cm from the internal uterine os (Einerson, Gilner and Zuckerwise, 2023).

Placenta previa can also be divided according to the depth of implantation. Adhesive placenta is the attachment of the chorionic villi, which are part of the placenta, to the deeper decidual layer of the endometrium. Placenta accreta is a deeper implantation of

the chorionic villi to the endometrium. Placenta increta is an implantation of the chorionic villi that penetrates the myometrium, while a more severe placental implantation that penetrates the serosal layer is known as placenta percreta. This abnormal implantation condition requires a deeper assessment to consider the management of labor without and with hysterectomy (Anderson-Bagga and Sze, 2025), (Einerson, Gilner and Zuckerwise, 2023)

Vaginal bleeding in the second and third trimester of pregnancy without feeling can be suspected as a symptom of placenta previa (Ramadhan, 2022). Bleeding in placenta previa can occur because the placenta attached to the lower uterine segment thins and widens as labor approaches, causing placental attachment to be disrupted and bleeding occurs. Bleeding in placenta previa can be influenced by sexual intercourse during pregnancy, vaginal examination, labor and some cases of bleeding occur without an identifiable cause. On examination using a speculum, active bleeding or minimal bleeding can be seen (Einerson, Gilner and Zuckerwise, 2023).

An environment rich in collagen and oxygen is needed for zygote implantation. The blastocyst, the outermost part of the zygote, is composed of trophoblast cells that will eventually form the placenta. In normal pregnancy, trophoblasts will attach to the decidua basalis in the endometrium. The injured area of the uterus has conditions rich in collagen and oxygen, which makes it very easy for trophoblasts to implant. The area of the uterus closest to the cervix is the most frequently damaged. Trophotopism, the process by which trophoblast cells develop toward the fundus, occurs in the placenta as the baby grows (Baumfeld *et al.*, 2017), (Feng *et al.*, 2018). The placenta itself does not move but grows toward the increasing blood supply in the fundus, leaving the distal part of the placenta in the lower uterine segment with a relatively poor blood supply to regress and atrophy. Then 90% of cases of placenta will experience migration. Migration can also occur because the lower uterine segment grows, increasing the distance from the lower edge of the placenta to the cervix (Feng *et al.*, 2018) Old placental tissue will experience total atrophy or leave remnants of blood vessels, known as vasa previa (Anderson-Bagga and Sze, 2025).

Caesarean section delivery is one of the conditions that causes injury to the uterus. Caesarean section delivery is the process of delivering the fetus, placenta and amniotic membranes through the abdominal wall by making an incision in the abdominal wall and uterus (Safitri, 2020). CS delivery is also defined as surgery to deliver the fetus by opening the abdominal wall and uterine wall (Sarwono, 2009) This CS delivery is carried out on indications with the aim of saving the mother and baby. The indications for cesarean delivery include high-risk age, history of cesarean delivery, non-advancing labor, post-term, failed induction, amniotic abnormalities, maternal disease, and fetal distress (Safitri, 2020).

Some theories say that uterine incision in the lower uterine segment during cesarean delivery can affect uterine vascularization. The part of the uterus that experiences an incision will cause scarring in the uterus and will shrink the decidua basalis and blood circulation will be disrupted (Baumfeld *et al.*, 2017). This condition causes insufficient vascularization to the fetus and causes the placenta to require a large space and a well-vascularized endometrium, namely the lower uterine segment adjacent to the internal



ostium of the uterus, known as placenta previa (Podungge *et al.*, 2023), (Cunningham *et al.*, 2010).

Research conducted at Batara Guru Hospital and Hikmah Sejahtera Hospital in 2021 regarding risk factors associated with the incidence of placenta previa showed that of the 24 respondents with a history of CS, 7 respondents experienced placenta previa and 17 did not experience placenta previa with a p-value of 0.035% indicating that there is a relationship between a history of CS delivery and the incidence of placenta previa (Mursalim, Nurdin and Sari, 2019). This study is in line with research conducted at DR.M. Yunus Bengkulu Hospital which showed that there was a relationship between a history of CS and the incidence of placenta previa with a p-value of 0.016. This study also shows that a history of CS has a 3 times greater risk of experiencing placenta previa compared to mothers who do not have a history of CS with an odds ratio of 3.826 (Wahyu *et al.*, 2019) in theory explains that if there are changes in the endometrium due to CS delivery, the placenta will implant in the lower part of the uterus (Mursalim, Nurdin and Sari, 2019), (Wahyu *et al.*, 2019)

Research conducted at the Prabumulih City Hospital explained that there was a significant relationship between a history of cesarean delivery and the incidence of placenta previa and there was a significant relationship between a history of curettage and the incidence of placenta previa (Anggriani, 2022) A study conducted at H Adam Malik General Hospital, Medan, showed that 19 people (35.2%) of pregnant women with a history of CS experienced placenta previa with complaints of bleeding. The researcher stated that there was a significant relationship between factors of childbirth history and the incidence of placenta previa. The researcher assumed that CS delivery resulted in scars in the uterus due to incisions during the CS process increasing the incidence of placenta previa (Syafitri and Suwandi, 2020).

A study conducted at Budi Kemuliaan Hospital in 2019-2022 stated that there was a significant relationship between a history of CS delivery and the incidence of placenta previa with a p-value of 0.014. This study also showed that mothers who had a history of CS delivery were 3 times more at risk of experiencing placenta previa compared to mothers who did not have a history of CS (Martinus, Purwati and Firlya, 2024). This study explains the theory that the healing process in CS delivery is assisted by macrophages, lymphocytes, neutrophils and leukocytes to help the formation of the uterine structure again after surgery, but if this process is disrupted, the process of forming the uterine structure becomes less than perfect, causing placenta previa in subsequent pregnancies (Downes *et al.*, 2015). Another theory also states that invasive actions in CS delivery can cause the formation of fibroid tissue and thinning of the decidua basalis tissue so that the implanted placenta must compensate by attaching to the highly vascularized part to meet the nutritional needs of the fetus so that the placenta will implant and widen to the lower segment of the uterus and even cover the internal ostium of the uterus (Timor-Tritsch *et al.*, 2019).

In a study conducted at Abdul Moeloek Hospital, it was stated that there was a relationship between a history of 2 or more CS deliveries with the incidence of placenta previa and had a 7.982 times risk of experiencing placenta previa compared to mothers who did not have a history of 2 or more CS (Trianingsih, 2012). This study is also supported by the results of a study conducted at Abdoel Wahab Sjahranie Hospital, Samarinda, which stated that there was a significant relationship between a history of CS and the incidence of placenta previa and a history of CS more than 2 times had a risk of 8.33 times experiencing placenta previa (Sari, Hastati and Pasaribu, 2024). This study is in line with the theory that the incidence of placenta previa will increase in women who have had 2 or more CS deliveries (Cunningham *et al.*, 2010)

A study that identified 705 pregnant women diagnosed with low-lying placenta between 17 and 24 weeks of gestation from 2003 to 2017 using a retrospective cohort study method found that the incidence of placenta previa increased 7 times higher compared to women without a history of CS delivery (King *et al.*, 2020). Several studies conducted with a retrospective cohort study design explained that the incidence of placenta previa will increase in line with the history of the number of cesarean deliveries. Cesarean delivery is also associated with placenta that is implanted too deeply, known as placenta accreta (Bowman *et al.*, 2014). A case-control design study explained that women who had undergone a cesarean section and had a history of placenta previa had a high incidence of placenta accreta (Fitzpatrick *et al.*, 2012).

A study conducted in 3 hospitals in Manado stated that a history of CS delivery in a previous pregnancy is not an absolute cause of placenta previa in the next pregnancy. There are other factors that can increase the incidence of placenta previa such as maternal age at the time of pregnancy, women who have given birth more than twice, twins, endometrial hypoplasia, damaged endometrium, history of abortion and history of previous placenta previa so that it is said that there is no significant relationship between a history of CS and the incidence of placenta previa (Husain, Wagey and Suparman, 2020). The findings of this study do not support the hypothesis that uterine wall incisions can result in uterine scarring, which will increase the risk of placenta previa (Mochtar, 2012). The findings of this study further contradict the hypothesis that women with a history of CS 2 or more times will have a higher incidence of placenta previa. The etiology of placenta previa has not been explained in detail but it can be assumed that the endometrium that is damaged during the CS delivery process and post-CS healing can cause blood flow disorders in the decidua basalis which is considered a factor that influences the position of implantation and the depth of abnormal placental implantation known as placenta previa. A history of CS delivery increases the risk of placenta previa by 3.9% (Cunningham *et al.*, 2010).

CONCLUSION

Based on several studies that have been conducted, it is said that there is a significant relationship between a history of caesarean section delivery and the occurrence of placenta previa in subsequent pregnancies. This is in accordance with the theory that incisions in the uterine wall during caesarean section delivery cause fibroid tissue that affects vascularization in placental implantation. Another theory also says that women who have a history of caesarean section 2 or more times have a higher risk of placenta previa, but there is 1 study that states there is no relationship between a history of



caesarean section delivery and the occurrence of placenta previa with the assumption that there are other more specific risk factors that cause placenta previa.

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