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DETERMINANT FACTORS AFFECTING THE INCIDENCE OF PLACENTA ACCRETA

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Abstract

Background: Placenta accreta is a rare condition during pregnancy characterized by abnormal placentation that can increase maternal morbidity and mortality. The increase in the incidence of placenta accreta is directly related to the increase in section caesarean rates. The maternal mortality rate in NTB in 2021 was 15% due to hemorrhage, in 2022 there was an increase in the incidence of placenta accreta at the NTB Provincial Hospital. The aim of the research is to identify the determinant factors affecting the incidence of placenta accreta at the NTB Provincial Hospital in 2022. **Methods:** This was a descriptive observational study. The population in this study were all mothers who delivered at the NTB Provincial Hospital from January to December 2022. The sample number was 50 patients diagnosed with placenta accreta. The sampling technique used was total sampling with the research variable of maternal characteristics. Data were collected from the medical records of mothers with placenta accreta from January to December 2022, and the results were analyzed using descriptive analysis. **Results:** Placenta accreta patients were more common in mothers with age ≤ 35 years with a median of 34.34 ± 4.28, multiparous parity (76%), overweight BMI (54%), 3-9 years labour spacing (82%), history of SC < 2 times (52%) and ≥ 2 times (48%), and with a history of uterine surgery 24%. **Conclusion:** Determinant factors that affect the incidence of placenta accreta in NTB Provincial Hospital in 2022 are mothers with age < 35 years, multigravida, overweight body mass index, mostly with a parity of 3-9 years, without degenerative diseases, all have a history of cesarean section and almost a quarter have a history of other operations on the uterus.

Keywords: placenta accreta, determinant factors, section Caesarea, hemorrhage

INTRODUCTION

Placenta accreta is a rare condition during pregnancy characterized by abnormal placentation (Morlando and Collins 2020). Placenta accreta is a problem in labour because it can cause morbidity and mortality. Around 7-10% of maternal deaths in the world are caused by placenta accreta. Maternal morbidity in placenta accreta is high. Studies show that 35% of patients with placenta accreta are rushed to the Installation Care Unit (Farquhar *et al.* 2017).

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The incidence of placenta accreta has increased worldwide in the last ten years with approximately 3 in 1,000 pregnancies experiencing placenta accreta (Belfort *et al.* 2018). In Ireland, a cohort study found that cesarean section (CS) birth rates increased from 4.1% in 1975 to 20.7% in 2010. Cesarean section births also increased from 17% to 64% during the same period. Cesarean section birth rates are also growing in Asia, including Indonesia. Studies in Asia found that the incidence rate of placenta accreta is 1 per 1,000 pregnancies. The incidence rate of placenta accreta in Indonesia has touched 2% since 2016 and continues to rise (Jauniaux *et al.* 2018)

In 2021 maternal deaths in NTB were mostly caused by hemorrhage at 15%, second by hypertension at 14%, and third by Covid-19 at 11% (DinKes 2022). NTB Provincial Hospital is a referral center hospital in West Nusa Tenggara which is a referral center in NTB, especially for obstetrics and gynecology cases. According to medical record data at the NTB Provincial Hospital, from January to August 2022 there were 40 women giving birth at the NTB Provincial Hospital who were diagnosed with placenta accreta, which showed a significant increase from the previous year.

The development of placenta accreta appears to be most strongly predicted by a history of cesarean section, low-lying placenta previa, in vitro fertilization pregnancies, and elevated levels of α-fetoprotein and β-human chorionic gonadotropin in the second trimester (Balayla and Bondarenko 2013). The incidence of placenta previa also increases by 3.2 to 14.6 percent as maternal age increases (Liang *et al.* 2022). However, other researchers showed that maternal age was not associated with placenta accreta in a control group with a history of cesarean section and placenta previa (Bowman *et al.* 2014). In addition, short pregnancy spacing is considered to increase the risk of uterine rupture in women with a history of cesarean section. This is associated with poor wound healing after cesarean section which can lead to placenta accreta (Bowman *et al.* 2014). Based on this background, the researchers wanted to study the determinant factors affecting the incidence of placenta accreta at the NTB Provincial Hospital.

METHOD

The type of research used is descriptive research with a retrospective approach where researchers do not intervene or treat variables and aim to see a description of the phenomena that occur in a population in a particular population. The population in this study were mothers who gave birth at the NTB Provincial Hospital in 2022. Samples in this study were taken using the inclusion criteria of laboring mothers who were clinically diagnosed with placenta accreta from January to December 2022 and the exclusion criteria of incomplete medical records. Samples were taken with a total sampling technique of 54 people, then 50 samples were obtained that met the inclusion criteria. The data used is secondary data collected from medical record data then the data is processed starting from editing, data coding, data entry and data cleaning, then the results of data processing are presented in the form of tables and narratives. Research ethics were obtained from the Ethics Committee of the NTB Provincial Hospital (No. 00.9.1/10/KEP/2023**).**

RESULT AND DISCUSSION

Based on the results of research on univariate analysis of sample data based on age, parity, body mass index, delivery distance, degenerative diseases, history of sc, and history of curettage. This can be seen in the following table :

Table 1.Sample Characteristics

Variable	Category	Amount (n)	Percentage (%)
Maternal age	≤ 35 years	31	62
	35 years	19	38
Parity	Primipara	12	24
	Multiparous	38	76
IMT	Underweight	1	2
	Normal	11	22
	Overweight	27	54
	Obesity	11	22
Delivery Distance	≤ 2 years	8	16
	3-9 years	41	82
	10 years	1	2
Degenerative disease	Hypertension	1	100
	Diabetes Mellitus	0	0
History of SC	2 times	26	52
	≥ 2 times	24	48
Curettage History	Yes	12	24
	No	38	76

According to research data, placenta accreta was found to be most prevalent in patients aged 35 years or younger at the NTB Provincial Hospital in 2022, with 31 (62%) patients affected. The least affected age group was patients over 35 years old, with only 19 (38%) patients affected. The youngest patient affected was 23 years old, while the oldest was 43 years old, with an average age of 34.34 years. The standard deviation was 4.28 and the mode was at the ages of 34 and 36 years. The majority of this research sample was in the age range of 20-35 years because this is a good age range for a woman to get pregnant and give birth. The results of this study are almost similar to the research (Ilvira 2021) with the average age of placenta accreta patients being 33.4 with a standard deviation of 4.46. Likewise, the results of research from (Erfani *et al.* 2019) found that the average age of placenta accreta patients was 33 years, as well as in research by (Dwi Putri *et al.* 2022) obtained research results that most patients with placenta accreta occurred at the age of 20-35 years, namely 67.8%.

In this study, it was found that 38% of the total sample was over 35 years old, which is an age group that is at risk of experiencing pregnancy complications such as placenta accreta. There is an increase in proliferation as the mother ages, which causes the placenta to grow deeper into the myometrium and other organs such as the urinary bladder (Zheng, Liu, and Xing 2019). Research conducted by (Qatrunnada 2018) shows that placenta accreta patients mostly occur in the age group over 35 years, namely 57%. Likewise with the research (Ornaghi *et al.* 2021) where it was reported that the age group that experienced more placenta accreta was the age group over 35 years at 52.1%. Research conducted by (Ming *et al.* 2022) found that the prevalence of placenta accreta increased by 2.2% as the mother's age increased. Several studies have explained that there is no significant relationship between maternal age and the incidence of placenta accreta, such as in research conducted by (Imafuku *et al.* 2021). The same thing was also conveyed in research by (Kyozuka *et al.* 2019) which shows that there is no relationship between maternal age and the incidence of placenta accreta.

In terms of maternal parity, 38 (76%) patients had the most multiparous parity, while only 12 (24%) patients had primiparous parity. Repeated pregnancies in multigravidas result in stretching and scarring of the uterine wall which can

increase the possibility of abnormal placental implantation. These results are directly proportional to the results of research conducted by research (Ming *et al.* 2022) that the incidence of placenta accreta occurs more often in mothers with parity more than equal to 3. Likewise, research (Zheng, Liu, *and* Xing 2019) found that mothers with multiparity have a significant relationship with the incidence of placenta accreta. Research (Farquhar *et al.* 2017) showed that of 295 samples of mothers with placenta accreta, 249 samples were mothers with multigravida parity. Fibrosis that occurs at the site of placental implantation in previous pregnancies results in multiparous mothers having a greater risk of experiencing placenta accreta in subsequent pregnancies (Silver and Barbour 2015).

According to body mass index, the average body mass index was 27.6 kg/m2, with the highest frequency distribution being overweight patients 27 (54%). Patients with a normal body mass index were 11 (22%), while the same number of patients were obese. Body mass index describes a person's nutritional status which is calculated from the comparison between body weight and height. The body mass index of the sample in this study was dominated by mothers with a body mass index above normal, namely overweight and obese. Obesity can increase the risk of complications in pregnancy such as gestational diabetes, pre-eclampsia, and an increased risk of cesarean section, so maternal BMI has an indirect impact on the incidence of placenta accreta. Research (Iacovelli *et al.* 2020) shows that there is a relationship between the incidence of placenta accreta and maternal obesity. In line with research results (Farquhar *et al.* 2017) where mothers who experience an increase in body mass index are more at risk of experiencing placenta accreta. In contrast, research (Bowman *et al.* 2014) shows that there is no relationship between an increase in a mother's body mass index and the incidence of placenta accreta she experiences. Research (Farquhar *et al.* 2017) shows almost the same frequency distribution between normal body mass index and body mass index *overweight* and obesity in mothers with placenta accreta. Body mass index is not an independent cause of placenta accreta (Vieira *et al.* 2021). Having an ideal body weight is one of the things that mothers must prepare before becoming pregnant to have a healthy and safe pregnancy.

The frequency of previous childbirth distance was greatest in patients with a previous delivery distance of 3-9 years (41 or 82%), followed by those with a delivery distance of ≤ 2 years (8 or 16%), and the least at a pregnancy distance of > 10 years (1 or 2%). The delivery distance that is too close can have an impact on the condition of the uterus and other reproductive organs not being optimal in preparing for pregnancy. The same results were also obtained in research (Prasetyo 2021), amounting to 70.6% of mothers with placenta accreta had a previous delivery between the ages of 3-9 years. Comparable to the results of (Bowman *et al.* 2014) which show that the average delivery distance in placenta accreta patients is 4.9 with a standard deviation of 4.0. There are not many studies that provide an overview of the influence of delivery distance on the incidence of placenta accreta. In some studies, it only explains the risk of uterine rupture if the birth distance is too close, which is due to the inadequate healing process of the cesarean section wound in the previous birth (Santoso *et al.* 2018). Research conducted by (McLaughlin *et al.* 2022) shows that a short birth interval is not associated with the incidence of placenta accreta.

Only 1 patient suffered from hypertensive degenerative disease, while no patients experienced diabetes mellitus degenerative disease. Degenerative diseases in pregnant women that are often associated with placenta accreta are hypertension and diabetes mellitus. The results of this study showed that of the 50 samples, only 1 person had the degenerative disease hypertension. In research (Bowman *et al.* 2014) of the total cases of placenta accreta, it was found that 2% of the sample had hypertension and 8.7% had diabetes mellitus. Endothelial damage in hypertensive patients and failure to heal cesarean section wounds in diabetes mellitus patients are associated with an increased risk of placenta accreta. (Bowman *et al.* 2014), diabetes mellitus has an indirect relationship with the incidence of placenta accreta which can be explained by the fact that diabetes increases pregnancy complications (macrosomia, preeclampsia, hypertension, and cardiovascular complications) and the frequency of obstetric interventions and cesarean sections.

All patients had a history of previous cesarean section, with 26 (52%) patients having a history of cesarean section less than 2 times and 24 (48%) patients having a history of cesarean section more than 2 times. The comparison between

those who have a history of less than 2 cesarean operations and those who have more than 2 times is very small. This shows that a history of cesarean section in a previous delivery is the most dominant determining factor that can cause placenta accreta. Poor surgical wound healing in previous deliveries may be a risk factor for placneta accreta in subsequent pregnancies. The presence of a surgical scar causes tissue damage in the uterus which causes hypoxic scar tissue in the cesarean section scar, triggering the invasion of placental trophoblasts deeper into the myometrium to obtain adequate oxygen supply. (Carusi 2018, Piñas Carrillo *and* Chandraharan 2019). The results of this study are similar to research (Ming *et al.* 2022) which shows that mothers with a history of CS more than equal to 2 are the dominant risk factor for placenta accreta. Research conducted in Japan by (Imafuku *et al.* 2021) involved 4,146 pregnant women where a significant relationship was found between the incidence of placenta accreta and the mother's history of CS. A study in Iran also showed that more than 97% of mothers with placenta accreta had a history of cesarean section in a previous delivery (Kasraeian *et al.* 2021). Each cesarean section experienced by the mother contributes to the formation of scar tissue and changes to the uterine wall, making it more difficult for the placenta to attach normally in subsequent pregnancies.

The greatest frequency of patients who experienced placenta accreta had no history of uterine curettage in previous pregnancies (80%), while only 12% had a history of other operations on the uterus in previous pregnancies. The same results were also shown in research by (Dwi Putri *et al.* 2022) where 39% of mothers who experienced placenta accreta had a history of other operations on the uterus such as curettage. Comparable to the results of (Kharisma *et al.* 2022) which shows that the majority of mothers with placenta accreta do not have a history of uterine curettage. In research (Bluth *et al.* 2021) found that more than half (52%) of mothers who experienced placenta accreta had undergone uterine curettage. As with cesarean section, uterine curettage also results in injury to the endometrial wall which can interfere with placental implantation and be a risk factor for placenta accreta in subsequent pregnancies. (Jauniaux *et al.* 2019)

CONCLUSION

The determinant factors affecting the incidence of placenta accreta in NTB Provincial Hospital in 2022 are mothers with age below 35 years, multigravida, overweight body mass index, mostly with a delivery interval of 3-9 years, without degenerative diseases, all have a history of previous cesarean section and almost a quarter have a history of other operations on the uterus. One effort that can be maximized by health workers, especially in preventing the increase in the incidence of placenta accreta, is by helping couples of childbearing age to prepare for pregnancy well, such as getting pregnant at a productive age, arranging birth spacing and several births, as well as physically preparing the mother for nutritional status. The ideal. A well-prepared pregnancy can reduce the risk of complications during pregnancy and childbirth so that the number of deliveries by cesarean section can decrease and the incidence of placenta accreta can also be reduced. Strict supervision during pregnancy also needs to be carried out for pregnant women who are at risk of placenta accreta with regular ANC, pregnancy screening with 10 T, and immediate consultation with an obstetrics and gynecology specialist if abnormalities are found.

DECLARATION

Conflict of Interest

Author declare there is no conflict interest in this research

Author's Contribution

All author contribute from concept until writing draff article

Ethical Approval

Research Ethics Committee of NTB Provincial Hospital
00.9.1/10/KEP/2023

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Data Avaibility

The data supporting this research are available from the author on reasonable request

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