

Original Article

Anemia during pregnancy and its influence on postpartum hemorrhage Syamsuriyati ¹²⁷, Rika Handayani ¹, Sutrani Syarif ¹, Nurhidayat Triananinsi ¹, Sunartono ²

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Background: Up to 50% of pregnant women in low-income and middle-income countries are affected by anemia, and 30.43% of maternal deaths in Indonesia occur during the postpartum period. One of the predisposing factors for postpartum hemorrhage is anemia in pregnancy.

Purpose: To investigate the experience of anemia during pregnancy and its influence on a postpartum hemorrhage.

Method: This is an observational analysis with a case-control study design. A total of 30 postpartum mothers took part in this research (15 case groups and 15 control groups). The anemia during pregnancy and incident of postpartum hemorrhage observed—data analysis with chi-square.

Results: As many as 76.5% of mothers who were anemic during pregnancy experienced postpartum hemorrhage. The analysis results found that anemia during pregnancy had a significant effect on the incidence of postpartum hemorrhage (p<0.001).

Conclusions: Anemia during pregnancy is very dangerous for postpartum mothers because it can have an impact on a hemorrhage.

INTRODUCTION

Currently, anemia in pregnancy is a global problem that has a significant impact on mothers and babies. The prevalence of anemia reaches 50% of pregnant women in low and middle-income countries. Several studies report that around 295,000 women lose their lives during pregnancy or the postpartum period. In Indonesia, 30.43% of maternal deaths occur during the postpartum period. The incidence of postpartum hemorrhage at this research location is also relatively high, namely 12-16%.¹⁻⁴

Postpartum bleeding can occur quickly and can cause death. A mother who is bleeding can die in less than an hour. Uterine atony and tearing of the birth canal are the most common causes of postpartum hemorrhage. Another factor that is thought to cause postpartum bleeding is anemia during pregnancy. This happens because of hemoglobin's role in delivering oxygen and nutrients to all body parts. Lack of hemoglobin causes the products of conception not to receive sufficient nutrition and oxygen, thereby increasing the risk of bleeding.^{5,6}

Previous studies have studied the relationship between anemia and postpartum hemorrhage. However, the magnitude of anemia's influence on the incidence of postpartum hemorrhage in previous studies has not been identified.^{7,8} Research is essential to fill in the existing gaps. This study aims to determine the effect of anemia during pregnancy on the incidence of postpartum hemorrhage.

METHOD

Study Design

This is an observational analytic with a case-control study design.⁹

Setting and Respondents

This research was conducted at the Bahonsuai Community Health Center, Morowali Regency. The population in this study was postpartum mothers, with a sample size of 30 respondents, who were divided into case and control groups. The inclusion criteria in this study were postpartum mothers aged 20-35 years, normal delivery,

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primiparous or multiparous, experiencing postpartum hemorrhage (case group) and not experiencing postpartum hemorrhage (control group). Mothers who experience blood clotting disorders and uterine abnormalities are exclusion criteria in this study. Sampling in this research was carried out using purposive sampling.¹⁰

The Variable, Instrument, and Measurement

The variables measured in this study were a history of anemia during pregnancy and a history of postpartum hemorrhage. This data was obtained from the patient's medical record data. Data is collected and recorded on a checklist sheet for easy identification.

Data Analysis

To determine the influence of anemia during pregnancy on the incidence of postpartum hemorrhage in research using the Chi-Square analysis test.

Ethical Considerations

This research has received ethical approval from the health research ethics committee of Bahonsuai Community Health Center, Morowali Regency, in 2023 with protocol number 20223105004 and Recommendation for Ethical Approval Number 663/UN4.14.1/TP.01.02/2023 from the Faculty of Public Health, Hasanuddin University.

RESULTS

Table 1 shows that most of the respondents in this study were 20-30 years old, had a high school education, were primiparous, and were honorary workers. 56.7% of respondents had a history of anemia during pregnancy, and 50% of respondents had a history of postpartum hemorrhage. The results of the analysis showed that 76.5% of mothers who experienced anemia during pregnancy experienced postpartum hemorrhage (p<0.001) (Table 2).

Table 1. (Characteristics	of Res	pondent
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Characteristics	Result		
Age, years			
20-30	23 (76.7%)		
31-35	7 (23.3%)		
Education			
Elementary	3 (10%)		
Junior High school	6 (20%)		
Senior High School	15 (50%)		
University	6 (20%)		
Occupation			
House Mother	10 (33.3%)		
Self-employed	5 (16.7%)		
Civil Servant	3 (10%)		
Honorary Workers	12 (40%)		

Parity				
Primipa	a	16 (53.3%)		
Multipar	ous	14 (46.7%)		
Anemia d	uring Pregna	ncy		
Yes			17	7 (56.7%)
No		13 (43.3%)		
Postpartu	m Hemorrhag	ge		
Yes			1	5 (50%)
No		15 (50%)		
Anemi	Postpartum	Hemorrhage	OR p-value	
during	Yes	No		
In Preg-				
nancy				
Yes	13 (76.5%)	4 (23.5%)	5.09	0.001

11 (84.6%)

DISCUSSION

No

2 (15.4%)

The results of the study found that anemia during pregnancy can have a significant impact on the incidence of postpartum hemorrhage (p<0.001). During pregnancy, if anemia occurs and is not treated until the end of pregnancy, it will have an effect during the postpartum period. In mothers with anemia, during postpartum, they will experience uterine atony. This is because there is not enough oxygen sent to the uterus. The insufficient amount of oxygen in the blood causes the uterine muscles not to contract adequately, which results in postpartum bleeding. Other research that supports these findings suggests that one of the risk factors for spontaneous postpartum hemorrhage is anemia. Another finding highlighted a relationship between anemia and the incidence of postpartum bleeding, so the results. This is important to anticipate bleeding caused by anemia because bleeding is the most significant contributor to maternal deaths.^{11,12}

The other studies supported these findings, stating that abnormalities in the coagulation system usually do not cause much bleeding in the early postpartum period. This depends on uterine contractions to prevent bleeding, and the effect of this is due to hemoglobin's ability to bind oxygen and oxygen's ability to transport. Nutrients throughout the body, especially in the placenta. Less hemoglobin implies less oxygen, which prevents the products of conception from getting adequate nutrition and oxygen. As a result, some or all of the placental tissue separates, and the uterus tries to evacuate the separated portion by contracting in order to remove the foreign object, which results in bleeding.¹³

Prepartum iron deficiency and anemia, along with acute blood losses during delivery, are the primary factors leading to postpartum anemia. The typical amount of blood lost during childbirth is 200-300 ml. However, 56% of women experience peripartum hemorrhage with blood loss exceeding 500 ml. Anemia can cause a deficiency of platelets and coagulation factors that are important for blood clot formation. Reduced blood clotting ability makes it difficult for the body to stop bleeding after giving birth, thereby increasing the risk of PPH. The predicted amount of blood loss during childbirth is the primary factor that determines the risk of severe anemia after giving birth.^{14,15}

Maternity mothers who suffer from uterine atony are very prone to a range of issues, such as post-partum hemorrhage. Uterine atony is responsible for 82.4% of post-partum hemorrhage. Three Uterine atony is a disorder characterized by insufficient uterine contraction, resulting in the inability of the uterus to effectively stop bleeding from the spot where the placenta was attached after childbirth. Uterine atony is characterized by the failure of the uterus to contract and remain relaxed after childbirth. Postpartum hemorrhage is most commonly caused by uterine atony.¹⁶

Postpartum hemorrhage is the predominant cause of significant blood loss in obstetrics. Postpartum hemorrhage is a common cause of maternal death. Various factors, such as postpartum hemorrhage-related bleeding, can cause it. Atonia may arise due to inadequate folding or contraction of blood vessels, resulting in postpartum hemorrhage. This condition occurs when the uterine wall is abnormally stretched, which can happen in cases of many pregnancies, hydramnios, macrosomia, or when the uterus has weakened contractions, as seen in Grande multipara or interval pregnancies. Pregnancies that occur too closely together at an old age, labor induction by oxytocin, and fast labor caused by excessive uterine contractions.¹⁷

CONCLUSIONS AND RECOMMENDATION

Anemia during pregnancy can harm the mother after giving birth. Mothers who experience anemia during pregnancy have a high potential for postpartum hemorrhage, and this can result in death. Routine health checks during pregnancy and early detection of anemia are recommended to prevent the effects it can cause. The results of this research can also be a policy basis for the government so that iron supplementation programs during pregnancy can be implemented.

REFERENCES

 Daru J, Zamora J, Fernández-Félix BM, et al. Risk of maternal mortality in women with severe anaemia during pregnancy and post partum: a multilevel analysis. *The Lancet Global Health*. 2018;6(5):e548-e554. doi:10.1016/S2214-109X(18)30078-0

- Bazirete O, Nzayirambaho M, Umubyeyi A, Karangwa I, Evans M. Risk factors for postpartum haemorrhage in the Northern Province of Rwanda: A case control study. *PLoS One*. 2022;17(2):e0263731. doi:10.1371/journal.pone.0263731
- Frass KA. Postpartum hemorrhage is related to the hemoglobin levels at labor: Observational study. *Alexandria Journal of Medicine*. 2015;51(4):333-337. doi:10.1016/j.ajme.2014.12.002
- Fasha NL, Rokhanawati D. Hubungan anemia dalam kehamilan dengan kejadian perdarahan postpartum di RSU PKU Muhammadiyah Bantul tahun 2018. *Jurnal Riset Kebidanan Indonesia*. 2019;3(2):102-105. doi:10.32536/jrki.v3i2.63
- Buzaglo N, Harlev A, Sergienko R, Sheiner E. Risk factors for early postpartum hemorrhage (PPH) in the first vaginal delivery, and obstetrical outcomes in subsequent pregnancy. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2015;28(8):932-937. doi:10.3109/14767058.2014.937698
- Butwick AJ, McDonnell N. Antepartum and postpartum anemia: a narrative review. *International Journal of Obstetric Anesthesia*. 2021;47:102985. doi:10.1016/j.ijoa.2021.102985
- Yasin Z, Hannan M, Wahyuni E. Anemia berhubungan dengan Perdarahan Post Partum. *Journal of Health Science (Jurnal Ilmu Kesehatan)*. 2021;6(1):13-18. doi:10.24929/jik.v6i1.1359
- Brenner A, Roberts I, Balogun E, et al. Postpartum haemorrhage in anaemic women: assessing outcome measures for clinical trials. *Trials*. 2022;23(1):220. doi:10.1186/s13063-022-06140-z
- Tenny S, Kerndt CC, Hoffman MR. Case Control Studies. In: StatPearls. Treasure Island (FL): StatPearls Publishing; March 27, 2023.
- Charan J, Biswas T. How to calculate sample size for different study designs in medical research?. *Indian J Psychol Med.* 2013;35(2):121-126. doi:10.4103/0253-7176.116232
- Pubu ZM, Bianba ZM, Yang G, et al. Factors Affecting the Risk of Postpartum Hemorrhage in Pregnant Women in Tibet Health Facilities. *Med Sci Monit.* 2021;27:e928568. doi:10.12659/MSM.928568
- Omotayo MO, Abioye AI, Kuyebi M, Eke AC. Prenatal anemia and postpartum hemorrhage risk: A systematic review and meta-analysis. J Obstet Gynaecol Res. 2021;47(8):2565-2576. doi:10.1111/jog.14834
- Sugiyarni L, Amalia R, Zuitasari A, Arif A. Hubungan Umur, Paritas dan Anemia dengan Kejadian Perdarahan Post Partum di Charitas Hospital Palembang Tahun 2021. Jurnal Ilmiah Universitas Batanghari Jambi. 2023;23(1):533. http://dx.doi.org/10.33087/jiubj.v23i1.3010

- Milman N. Postpartum anemia I: definition, prevalence, causes, and consequences. *Ann Hematol.* 2011;90(11):1247-1253. doi:10.1007/s00277-011-1279-z
- Bergmann RL, Richter R, Bergmann KE, Dudenhausen JW. Prevalence and risk factors for early postpartum anemia. *Eur J Obstet Gynecol Reprod Biol.* 2010;150(2):126-131. doi:10.1016/j.ejogrb.2010.02.030
- 16. Ngwenya S. Postpartum hemorrhage: incidence, risk factors, and outcomes in a low-resource setting. *Int J Womens Health*. 2016;8:647-650. doi:10.2147/IJWH.S119232.
- Juariah S, Sartika S, Linda N, Anggraeni FW. Risiko Atonia Uteri terhadap Perdarahan Post Partum di Puskesmas Beber Kabupaten Cirebon. *Jurnal Kesehatan Pertiwi*. 2019. 1(2): 43-47.