International Journal of Innovation Scientific Research and Review
Vol. 04, Issue, 11, pp.3546-3548, November 2022
Available online at http://www.journalijisr.com
SJIF Impact Factor 4.95

ISSN: 2582-6131

Research Article

BLEEDING MANAGEMENT IN PLACENTA PREVIA

[1,] *I Gede Ngurah Harry Wijaya Surya, [1]I Gede Sastra Winata, [1]William Alexander Setiawan, [2]Robert Euro Djojoseputro, [2]Putu Ayu Divya Nirmala, [2]I Gusti Agung Ayu Chintya Cahyarini

[1]Obstetrics and Gynecology Department, Prof. Dr. I.G.N.G. Ngoerah Hospital/Medical Faculty of Udayana University, Bali, Indonesia.
[2]Medical Faculty, Udayana University, Bali, Indonesia.

Received 08th September 2022; Accepted 10th October 2022; Published online 21th November 2022

ABSTRACT

Introduction: Placenta previa is an abnormal condition during pregnancy that poses risk for ante, intra-, and post-partum blood loss. Massive uncontrolled blood loss can lead to serious obstetric complications, including maternal and neonatal morbidity and mortality. **Objective:** This study aims to review and understand bleeding management for placenta previa presenting as the ante- and post-partum bleeding. **Methods:** Literature search was conducted on Google Scholar and Pubmed databases for articles published in 2017 to 2021. Keywords used include 'bleeding', 'hemorrhage', 'antepartum', 'postpartum', 'management', and 'placenta previa'. **Results:** Literature search yielded 142 articles with 14 articles included in the final analysis. The result showed that the main principle of antepartum bleeding management is to maintain maternal hemodynamic stability and determine whether emergency cesarean birth is necessary. A restrictive fluid resuscitation and transfusion protocol should be applied for patients presenting with acute and massive bleeding. For postpartum bleeding management, administration of certain uterotonics (i.e. oxytocin) and tranexamic acid are considered feasible options to prevent massive bleeding. While the most effective postpartum bleeding management is considered to be Bakri balloon tamponade, uterine gauze packing appears as a good alternative in a resource-limited setting. **Conclusion:** Placenta previa in pregnancy poses a risk for bleeding which can be treated before, during, and after the delivery, in order to improve maternal and neonatal outcome. Accurate diagnosis and close observation during the antenatal period are keys to recognizing the risk of bleeding and planning the proper delivery process.

Keywords: Placenta previa, bleeding, hemorrhage, management.

INTRODUCTION

Placenta previa is a condition where the placenta is implanted in the lower uterine segment, overlying the endocervical ostium either partially or totally. Its incidence is estimated to be 1 in 200 pregnancies throughout the world and its increase has been contributed to the increasing rate of cesarean delivery (CD). The pathophysiology of placenta previa itself is yet to be determined. Currently, several factors that are thought to be associated with the condition are endometrial damage and uterine scarring. Some other risk factors related to placenta previa are advanced maternal age, multiparty, tobacco consumption, cocaine use, history of undergoing procedures with potential endometrial scarring, such as suction and curettage, assisted reproductive technology, cesarean section(s), and a prior case of placenta previa.[1,2] Placenta previa itself is one of the most common causes of antepartum bleeding, thought to be caused by the separation of placenta due to contractions, cervical effacement, dilatation, and increasing gestational age.[1,2] Women with placenta previa are ten times more likely to have antepartum bleeding compared to those without. Placenta previa can also be accompanied with abnormal placenta adhesion known as placenta accreta syndrome (PAS), that includes conditions such as placenta accreta, increta, and percreta. These conditions are classified based on the depth of its adhesion. Presence of PAS can then further worsen bleeding and even cause massive hemorrhage. Therefore, placenta previa is highly associated with preterm birth, which might be followed by maternal and fetal morbidity. The presence of antepartum bleeding in placenta previa might necessitate emergency treatment and management. To provide adequate management, the procedures preparations and multidisciplinary approaches need to be taken to improve outcomes of bleeding in placenta previa.[3,4] This article was conducted to further review the management of bleeding in patients with placenta previa. The main focus will be bleeding management before and after delivery, in order to improve maternal as well as neonatal outcomes.

***Corresponding Author: I Gede Ngurah Harry Wijaya Surya,**
1Obstetrics and Gynecology Department, Prof. Dr. I.G.N.G. Ngoerah Hospital/Medical Faculty of Udayana University, Bali, Indonesia.

METHOD

We conducted a review on literatures that discussed ante- and post-partum bleeding management in placenta previa. Literature search was conducted on Google Scholar and Pubmed databases from 2017 to 2021 using the following keywords: 'bleeding', 'hemorrhage', 'antepartum', postpartum', 'management', and 'placenta previa'. For the analysis, we included descriptive and analytic studies describing management in antepartum and postpartum bleeding due to placenta previa. We excluded case reports, case series, and studies with sample size less than 50 to producea more accurate result.

RESULTS

We identified 142 potentially relevant citations. Based on the title and abstracts, full texts of 24 articles were selected for further reading and detailed evaluation. Out of the 24 articles, 10 were excluded and the remaining 14 articles were chosen and would later be analyzed. After thorough reading, a review regarding the management for bleeding in patients with placenta previa would be written. The management principle will be centered around the ante- and post-partum bleeding due to placenta previa.

Antepartum bleeding management

An acute and active antepartum bleeding is a potential obstetric emergency, one of which is caused by placenta previa. The common practice for patients admitted with antepartum bleeding are testing for complete blood count, coagulation profile, maintenance of an intravenous line, and ensuring availability of blood transfusion.[2] Maintaining maternal hemodynamic stability and determining if emergency cesarean birth is indicated are the major goals in managing these patients. In most patients not accompanied by massive bleeding, the need for an urgent transfusion is unlikely, and a restrictive transfusion strategy has been recommended when hemoglobin dropped below 7 g/dL.[4] Initial management includes fluid resuscitation with crystalloid and/or blood products if hypovolemia is suspected while cautiously avoid giving excess crystalloid. A randomized controlled trial reported that restrictive intravenous fluid resuscitation (1-2 ml of crystalloid for every 1 ml of blood loss) was deemed beneficial with a low occurrence of coagulopathy. After administering crystalloid therapy, O negative, non-cross matched blood could be administered. One unit of ±300 ml can increase maternal hemoglobin by 1 mg/dL in the absence of active bleeding. Other than this method, initiating warming of the patient can be considered to maintain normothermia in the patient, thus preventing reduction in hemoglobin. However, if the patient fails to stabilize or is accompanied by massive bleeding, a massive transfusion protocol should be implemented to address pre- and intra-operative management.[2,3] Initial measurements of hemoglobin levels are useful as a baseline measure and can be evaluated to determine the severity of bleeding and anemia. In the case of massive transfusion protocol, fresh frozen plasma infusion should be considered. It is usually administered in the case of coagulopathy, which could be caused by numerous conditions such as acidosis, hypocalcemia, as well as hypothermia.[3,4] This can then be further confirmed with laboratory tests indicating abnormalities in platelet counts or signs of platelet function impairment shown on rotational thromboelastometry (ROTEM) tests. Furthermore, fibrinogen levels are also associated with bleeding severity in the case of massive bleeding, meaning its levels would also need to be monitored to determine the need for fibrinogen concentrate administration.[5] Hypotension can occur due to a compression of gravid uterus to the inferior vena cava, causing a decrease in venous return when the patient lies supine. Tilting the patient to the left or manually displacing the patient's uterus to the left could help increase the venous return flow as manual decompression.[3] The preferred mode of delivery for placenta previa is Caesarean Delivery.[6] Some articles mentioned that trial of vaginal delivery can be conducted with partial placenta previa. Total placenta previa mandates a delivery by caesarean section. Carefully carried out ultrasonography examination during the antenatal period and planning proper CD are the first steps to avoid excessive bleeding during intra- and postpartum period.[6] Tocolysis has not been proven to extend pregnancies with placenta previa.[2] In a multicentre randomized controlled trial in which tocolysis with nifedipine was compared with placebo, reported that no significant prolongation of pregnancy nor improvement in outcomes was found. However, in the presence of antepartum bleeding or contractions of the uterus, use of tocolysis for a period of up to 48 hours may be considered to allow administration of corticosteroids. It should be noted that tocolysis is contraindicated in women with ongoing antepartum bleeding that can result in hemodynamic instability. In this scenario, delivery should be considered. Cesarean delivery may be warranted when repeated episodes of antepartum bleeding or contraction have occurred. It should then be preceded by administrating corticosteroids to enhance fetal lung maturation if the gestational age is prior to 35+0 weeks.[7]Vaginal or anal sexual activity and insertion of foreign bodies into the anus/rectum or in vagina, such as tampons, should be avoided (with the exception of transvaginal ultrasound by an experienced sonographer).[2]

Postpartum bleeding management

Inadequate uterine tone or contraction of the lower uterine segment is one of the most concerning factors regarding postpartum hemorrhage (PPH) in placenta previa. The use of uterotonic is recommended for all women in the postpartum period. The uterotonic of choice is oxytocin and it is regularly included as a part of the active management of the third stage of labor. The guideline recommended administration of 10 IU of oxytocin intravenously or intramuscularly immediately after the baby delivery. Other uterotonics might be utilized when oxytocin is not readily available. Alternative uterotonics are carbetocin, misoprostol, ergometrine, oxytocin-ergometrine fixed dose combination, but several precautions needed to be considered before administration.[8] In the settings of CD, oxytocin is still commonly used to prevent PPH. A meta-analysis study conducted by Torloni et al. concluded that no remarkable differences were found between prophylactic oxytocin administration before versus after fetal delivery.[9] An international consensus guideline written by Heesen et al. recommended that oxytocin should be given immediately after delivery of the fetus. The dosage needed will be greater in intrapartum caesarean sections compared to the elective low-risk caesarean sections. Even though oxytocin has minimal adverse effects with rapid high-dose administration, slow intravenous infusion method should be employed to further minimize side effects. The recommended dose of oxytocin, in elective caesarean section, is 1 IU given bolus and then followed with oxytocin infusion at a rate of 2.5-7.5 IU/hour or 0.04-0.125 IU/minute. In cases of intrapartum emergency caesarean section, a dose of 3 IU oxytocin is given over ≥30 seconds followed with oxytocin infusion at a rate of 7.5-15 IU/hour or 0.125-0.25 IU/minute.[10] Tranexamic acid, an antifibrinolytic drug, is one of the drugs of choice to control PPH. The WOMAN trial has shown that administration of tranexamic acid reduced death due to bleeding and also the rate of laparotomies performed to provide adequate bleeding control in PPH; without evidence of any increased risk of thromboembolic events. The WOMAN trial results suggested tranexamic acid to be administered as soon as the onset of postpartum bleeding for an optimal result. The dosage of tranexamic used in the WOMAN trial was 1 gram administered via slow intravenous injection at a rate of ~ 1 mL (100mg/mL) per minute. Repeat dose was given if bleeding persisted for more than 30 minutes or the bleeding stopped and restarted within 24 hours of the first dose.[11]PPH occurring after CD in patients with placenta previa exists as one of the crucial factors leading to maternal morbidity and mortality. Blood transfusions are given in ±10% of CD for placenta previa, around 4% even requires peripartum hysterectomy. Bleeding control during CD can be attained using repeated administrations of uterotonics, local placental bed suture, and uterine devascularization. Uterine packing with gauze is also considered an effective way to control PPH in a limited setting. Another approach that can be taken is by performing a specialized compression suture such as B-Lynch suture. Moreover, a different method of compression suture such as the longitudinal vertical compression suture method, can be used. Compared to the B-lynch suture that is usually appropriate for cases of uterine atony, longitudinal vertical sutures are thought to be simple, rapid, and easier to be conducted in cases of emergency. These sutures are usually performed in conjunction with placement of a balloon catheter.[5,12] Balloon catheters and intrauterine balloon tamponade are used to create a tamponade effect. Due to its simple, minimally invasive, and easy to use nature, intrauterine balloon tamponade is increasingly recognized as a first-line surgical intervention to manage PPH before opting to a more invasive measure, such as hysterectomy.[13] An example of a balloon that can

be used is the Bakri balloon, which was first described in 2001. It is designed to control bleeding caused by placenta previa and has also decreased the rate of hysterectomy to about one-third than before. The tamponade effect caused by Bakri balloon exerts pressure on the walls of the myometrium, causing a stimulus that will further result in a myometrial contraction. In a study conducted by Maher & Abdelaziz, placement of the Bakri balloon is associated with a reduction of blood loss intrapartum and postpartum. The hydrostatic effect of the Bakri balloon causes immediate hemostasis against bleeding surfaces. In this study, about 87,5% of cases were successful in achieving hemostasis with the use of the Bakri balloon. However, with all the benefits it offered, several adverse events must be anticipated, such as concealed bleeding, uterine perforation, or dislodged balloon.[13,14,15] Aside from the Bakri balloon, several other approaches have been studied such as the double-balloon catheter and balloon catheter of the internal iliac artery, usually placed as a prophylaxis. A study conducted by Wei et al. stated that balloon tamponade resulted in hemostasis in 90% of cases, showing less hemorrhage, less cases of PPH with a volume of over 1000 ml, less puerperal morbidity, as well as less postpartum pain. As for placement of the prophylactic balloon catheter, this method could be used intraoperatively in the case of hemorrhage during and after cesarean section. This method comprises prophylactic intravascular balloon occlusion of the internal iliac arteries (PBOIIA) and abdominal aorta arteries (PBOAA). The PBOIIA method was first introduced in 1997 and reported as the first hemostatic procedure during cesarean section for patients with hemorrhage due to placenta previa. Though some studies state its controversy, a study by Fan et al. found that this procedure had an advantage for controlling severe hemorrhage by reducing the amount of blood loss during a cesarean section. It was also stated that there was a significant difference in blood loss as well as packed red cell transfusions in patients with PBOIIA procedure compared to those without.[13,15] This approach should be planned preoperatively and performed immediately during the cesarean section as soon as the baby has been delivered and prior to placental delivery. Placental expulsion can be carried out after the ligation using gel foam particles. Tran catheter arterial balloon occlusion is another option to minimize blood loss in patients with placenta previa. Obviously, cautious communication and planning among the team are essential to improve the outcomes.[4,13]

CONCLUSION

Placenta previa in pregnancy poses a risk for bleeding antepartum, intrapartum, and even postpartum. Accurate diagnosis and close observation during the antenatal period is key to recognizing the risk of bleeding and determining the proper delivery process. A restrictive fluid resuscitation and transfusion protocol should be considered in the patient present with acute and massive antepartum bleeding. Caesarean section is commonly the recommended delivery mode for women with placenta previa. Administration of certain uterotonics (i.e. oxytocin) and tranexamic acid can help improve the outcome by controlling the volume of blood loss. Prophylactic radiological interventions such as prophylactic intravascular balloon occlusion of the internal iliac arteries orabdominal arteries are also considered feasible options to prevent massive postpartum bleeding. While the most effective postpartum bleeding management is considered to be Bakri balloon tamponade, uterine gauze packing appears to be a good alternative in a resource-limited setting.

REFERENCES

1. Silver R. Abnormal Placentation: Placenta Previa, Vasa Previa, and Placenta Accreta. Obstetrics & Gynecology. 2015;126(3):654-668.
2. Jain V, Bos H, Bujold E. Guideline No. 402: Diagnosis and Management of Placenta Previa. J Obstet Gynaecol Can. 2020;42(7):906-917.e1
3. Young JS, White LM. Vaginal Bleeding in Late Pregnancy. Emerg Med Clin North Am. 2019;37(2):251-264.
4. Park HS, Cho HS. Management of massive hemorrhage in pregnant women with placenta previa. Anesth Pain Med. 2020;15:409-416.
5. Mohamed MA, Mohammed AH. Parallel vertical compression sutures to control bleeding in cases of placenta previa and accreta. J Matern Fetal Neonatal Med. 2019;32(4):641-645.
6. Alouini S, Megier P, Fauconnier A, Huchon C, Fievet A, Ramos A et al. Diagnosis and management of placenta previa and low placental implantation. The Journal of Maternal-Fetal & Neonatal Medicine. 2019;33(19):3221-3226.
7. Jauniaux E, Kingdom J, Silver R. A comparison of recent guidelines in the diagnosis and management of placenta accreta spectrum disorders. Best Practice & Research Clinical Obstetrics & Gynaecology. 2021;72:102-116.
8. Gallos ID, Williams HM, Price MJ, Merriel A, Gee H, Lissauer D et al. Uterotonic agents for preventing postpartum haemorrhage: a networkmeta-analysis. Cochrane Database of Systematic Reviews 2018, Issue 4. Art. No.: CD011689.
9. Torloni M, Siaulys M, Riera R, Cabrera Martimbianco A, Leite Pacheco R, Latorraca C et al. Timing of oxytocin administration to prevent post-partum hemorrhage in women delivered by cesarean section: A systematic review and metanalysis. PLOS ONE. 2021;16(6):e0252491.
10. Heesen M, Carvalho B, Carvalho J, Duvekot J, Dyer R, Lucas D et al. International consensus statement on the use of uterotonic agents during caesarean section. Anaesthesia. 2019;74(10):1305-1319.
11. WOMAN Trial Collaborators. Effect of early tranexamic acid administration on mortality, hysterectomy, and other morbidities in women with post-partum haemorrhage (WOMAN): an international, randomized, double-blind, placebo-controlled trial. Lancet 2017;389:2105–16.
12. Peng X, Chen D, Xu J, Liu X, You Y, Peng B. Parallel transverse uterine incisions, a novel approach for managing heavy hemorrhage and preserving the uterus. Medicine. 2019;98(44):e17742.
13. Wei J, Dai Y, Wang Z, et al. Intrauterine double-balloon tamponade vs gauze packing in the management of placenta previa: A multicentre randomized controlled trial. Medicine (Baltimore). 2020;99(7):e19221. doi:10.1097/MD.0000000000019221
14. Maher MA, Abdelaziz A. Comparison between two management protocols for postpartum hemorrhage during cesarean section in placenta previa: Balloon protocol versus non-balloon protocol. J Obstet Gynaecol Res. 2017;43(3):447-455.
15. Fan Y et al. A Participant-assigned Interventional Research of Precesarean Internal Iliac Artery Balloon Catheterization for Managing Intraoperative Hemorrhage of Placenta Previa and Placenta Accreta Spectrum Disorders After Cesarean Section. Current Medical Science. 2021;41(2):336-34

****