

Definition, Diagnosis, Tactics for Postpartum Bleeding: A Literary Review

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Abstract

Postnatal bleeding is bleeding from the parturient canal that happens either early or late after childbirth. Postnatal bleeding is most often a consequence of the main obstetrical ramifications. The gravity of postnatal bleeding is dictated by the amount of loss of blood. Postpartum bleeding is the main cause of maternal death morbidity and death in the world. According to WHO, postpartum bleeding counts for up to 75% of maternal mortality, which is more than 70,000 deaths annually worldwide. These implications involve acute exposure to hemorrhagic shock, such as multiple organ stroke, morbidity associated with blood transfusion, declivity chronic anemia, and hospitalization in a hospital unit staffed and equipped to provide intensive care. The widespread introduction of current clinical recommendations into the practice of specialists to solve this problem remains a serious not only medical but also social problem, as it causes death and has a high impact on physical and psycho-emotional health. It should be noted that despite the possibilities of predicting blood loss, compliance with active patient management methods, and the use of preventive and laboratory measures, this pathology remains relevant to the present day.

Keywords: Postpartum bleeding, Maternal mortality, Uterotonic therapy, Uterine massage, Compression suture

INTRODUCTION

Currently, postpartum hemorrhage (PB) is the main cause of disease and mortality among women in labor. Globally, postpartum bleeding is responsible for eight percent of maternal mortality in industrialized countries and twenty percent of maternal mortality in developing countries. **Figure 1** shows the structure of the reasons for maternal death in the Russian Federation.

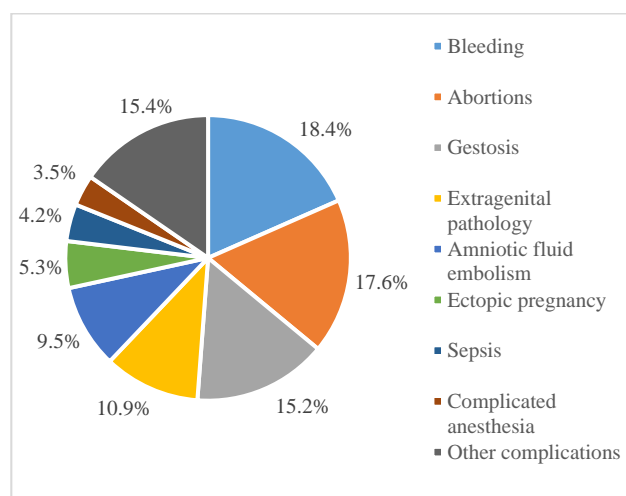


Figure 1. The structure of the reasons for maternal death in the Russian Federation (2020-2022)

The usual account of the bloodstream to the uterus during gestation is around 600 milliliters per minute, as opposed to 60 milliliters per minute outside the gestational period [1]. The control of postnatal loss of blood appears generally on uterine contractions and, to a lesser degree, on the energizing of the clotting cascade. PB is loss of blood that occurs both during natural delivery and during surgical intervention in this process (the Cesarean section), exceeding five hundred milliliters during natural childbirth and more than a thousand ml during surgical delivery, or any clinically significant amount of blood loss that manifests itself within 6 weeks [2].

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PB is considered primary if it happens in the first twenty-four hours after bringing, and secondary if it happens between twenty-four hours and twelve weeks after bringing [3]. The causes of PB should be represented with four letters "T": tone (uterine atony), trauma (crush or break of the uterus), tissue (placenta retention or clots), and thrombin (deficiency of blood coagulation factors) (**Figure 2**) [2].

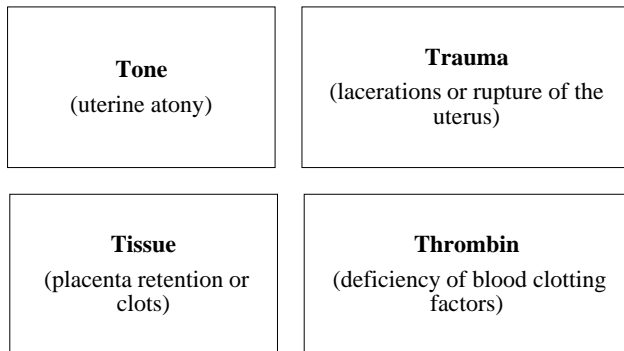


Figure 2. Causes of postpartum bleeding

The most popular reason is uterine atony (about seventy percent of the cases), applied by obstetric ruptures (around twenty percent), placental tissue retention (around ten percent), and deficiency of blood coagulation factors (a little less than one percent) [2]. PB can induce declivity chronic anemia needing transfusion of blood, disseminated intravascular coagulation (DIC), hysterectomy, multiple organ stroke, and mortality [2].

PB caused by hypotonic uterine or its atony may be triggered by various factors such as chorioamnionitis, administration of magnesium sulfate for therapeutic purposes, prolonged or rapid labor, uterine fibroids, uterine overgrowth due to multiple pregnancies, fetal macrosomia, or polyhydramnios. We consider it very important to mark that Cesarean section carries a greater risk of postpartum bleeding compared to vaginal delivery. Additionally, advanced maternal age and extreme parity values further contribute to the risk of PB [4].

Based on the analysis of extensive population studies, the main risk factors for bleeding are placental tissue residues, obstetric injuries, hypertensive conditions, oxytocin delivery stimulation, enlarged fetuses, and eclampsia. Despite endeavors to pinpoint individuals at a heightened risk of postpartum bleeding, this critical complication can still arise unexpectedly in women without discernible risk factors [5]. Hence, it is essential to maintain vigilance following every childbirth.

MATERIALS AND METHODS

Within the framework of this scientific research, publications, abstracts, and texts of articles in the most popular databases were studied for the following keywords: "postpartum bleeding", "maternal mortality", "uterotonic therapy", "uterine massage", and "compression suture". Such resources

as PubMed, CyberLeninka, Hindawi, and Google Scholar were used as sources of information, while access to the materials of interest was not limited. In addition, a manual literature search was also conducted.

RESULTS AND DISCUSSION

To avoid serious consequences for the young mother, possible postpartum bleeding requires a high-quality management strategy, in which discipline and well-coordinated work of medical personnel play an important role. First of all, it is necessary to monitor the vital signs of a woman in labor, to maintain her vital resources in order. It is important to accurately estimate the amount of blood lost. If necessary, it is necessary to resort to medications to stop bleeding and artificial resuscitation [6]. Evaluating continuous loss of blood is a critical part of postpartum bleeding management. This assessment can be conducted through visual inspection or by weighing materials such as surgical sponges and sheets saturated with blood and amniotic fluid [7]. While there is no definitive confirmation favoring one method of loss of blood assessment over another, quantitative methods offer a more precise evaluation of blood loss in contrast to subjective assessments [8]. Incorporating the quantification of blood loss into maternal safety protocols can potentially lower morbidity rates in women experiencing severe postpartum bleeding.

Despite these constraints, certain obstetricians and gynecologists' societies opt to quantify the loss of blood by weighted blood-moistened contents (such as pads or sponges), tracking irrigation fluid usage, and employing periodic graduated cylinder bandages in cases of postpartum bleeding [9]. Lately, there has been growing interest in utilizing colorimetric techniques, including electronic artificial intelligence tools (like smartphone applications), for real-time assessment of blood loss [10]. If a woman in labor has a high risk of postpartum bleeding, two intravenous cannulas with a large diameter should be installed in advance. Under high risk, we understand the presence of complete placenta previa, as well as active vaginal bleeding. It is also necessary to take a blood sample to perform a general blood test. Further monitoring of the mother should be tailored to the specific reason and level of enlarged risk of postnatal bleeding. This monitoring may include continuous measurement of oxygen, calculation of diuresis during urinary catheter placement, continuous assessment of the cardiovascular system, and consideration of blood clotting status based on parameters such as prothrombin time, fibrinogen levels, and activated partial thromboplastin time [2]. If the patient has a very great chance of postnatal bleeding, central catheters (venous and arterial) must be installed. To mitigate hypothermia, which is frequently related to massive infusion resuscitation and long-term surgery, a heating and cooling cushion with circulating water or a forced air heating system can be used. Crystalloids have a slight advantage over colloids, but colloids can also be used [11].

Examination of the placenta after childbirth is important to exclude remnants of placental tissue or the placental succinate lobe (abnormalities in the structure of the placenta, when one or more additional parts are connected to the main lobe of the placenta with its blood vessels). If the preservation of placental tissue is suspected, it is recommended to evacuate it using a manual examination or a banjo curette (blunt) under ultrasound control. The positive and negative prognostic value of ultrasound when detecting preserved placental tissue is around fifty-eight percent and eighty-seven percent, accordingly [12]. A thorough examination of the lower genital tract for ruptures of the cervix, vagina, perineum, or rectovaginal region is essential. Rupture should be sewn up immediately with absorbable filaments.

Bimanual uterine massage commonly serves as the initial approach to managing postpartum bleeding attributed to uterine atony. This massage is conducted to promote uterine contractions by stimulating the release of endogenous prostaglandins [13]. Oxytocin, whether given intravenously or intramuscularly, forms the cornerstone of postpartum bleeding treatment stemming from uterine atony. As a rule, oxytocin is administered simultaneously with uterine massage, unless it is administered for prevention. The response of the uterus following intravenous oxytocin administration is generally rapid, with oxytocin's plasma half-life ranging from 1 to 6 minutes [14].

In cases where pharmacological intervention proves ineffective for uterine atony, mechanical approaches are employed, such as balloon tamponade and uterine compression sutures. Balloon tamponade, similar to the Bakri balloon, introduced in the two thousand first year, entails filling an intrauterine balloon with fluid (up to approximately 500 ml maximum volume) and removing the balloon within 24 hours of insertion. The filled balloon's tamponade effect is to have intentions to halt or diminish the bleeding of uterine [15]. Based on the research of the two thousand and twentieth year, balloon tamponade systems of the uterus demonstrate a favorable safety profile, boasting a success rate exceeding 85% in addressing postpartum bleeding [10]. Uterine compression sutures also referred to as "fixation sutures," were initially introduced in the year one thousand nine hundred and ninety-seven by B. Lynch and collaborators, demonstrating considerable efficacy in managing postpartum bleeding [16]. Following the initial description in 1997, various other uterine compression suture techniques have been outlined. Numerous systematic reviews of case series have indicated an impressive overall success rate exceeding 90% when employing corset sutures for managing postpartum bleeding [17]. Potential complications of compression sutures include uterine necrosis and intrauterine synechiae. Blood transfusion begins when loss of blood exceeds one thousand and five hundred milliliters or when hemodynamic changes occur. In situations requiring a large blood transfusion, prescribed as the administration of more than ten units of red blood cells within twenty-four hours or more than four units of red blood cells within 45-60 minutes,

the process begins immediately [18]. Whenever feasible, preventive measures for postpartum bleeding should be implemented, ideally commencing before conception. This involves identifying women with great risk and if needed, interventions to enhance iron stores and hemoglobin levels. Monitoring women for risk factors associated with PB during pregnancy and childbirth can aid in preparing for delivery, including selecting the appropriate delivery facility [19].

CONCLUSION

Postpartum bleeding continues to represent a substantial clinical concern leading to maternal complexities and mortality. Globally, one woman succumbs to postnatal bleeding every seven minutes. It should be noted that despite the possibilities of predicting blood loss, compliance with active patient management methods, and the use of preventive and laboratory measures, this pathology remains relevant to the present day.

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