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INCIDENCE OF SEVERE POSTPARTUM HEMORRHAGE IN OBESE WOMEN FOLLOWING DELIVERY

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Abstract

Introduction: Maternal obesity increases the risk of maternal complications such as severe PPH, which has been rated as one of the main causes of maternal mortality. This research paper aims to describe the prevalence, causes, and management of severe PPH in obese women.

Objectives: The aim of this study is to identify the prevalence and risk factors for severe PPH in overweight and obese women after childbirth and to investigate the strategies that would help to reduce maternal mortality.

Materials and Methods: A retrospective cohort study was conducted in Department of Obstetrics and Gynaecology, MTI/ Mardan Medical Complex, Mardan, Pakistan, over a period of one year from October, 2024 to September 2025. Statistics gathered from 1200 obese women pertaining to demographic profiles, type of delivery, and its consequences have been collected and examined. Comparison with prior studies and statistical analysis pointed out several factors that significantly determine severe PPH.

Results: Severe PPH was noted in 18% of the cases, and it was found to be more common in morbidly obese women and those who had cesarean sections. Morbid obesity was taken as the most significant risk factor, with an odds ratio of 3.2, followed by prolonged labor, having an odds ratio of 2.8, and preeclampsia, with an odds ratio of 2.5.

Conclusion: Obesity has been found to have a strong correlation with PPH. Based on research, primary and secondary interventions before conception, during pregnancy, and during labor and birth are necessary to enhance the health of women.

Keywords: *Obesity, postpartum hemorrhage, cesarean delivery, preeclampsia, maternal outcomes.*

INTRODUCTION

The rate of PPC has emerged as an area of interest in obstetrics as obesity increases in women of childbearing age and the morbidity and mortality associated with it. Postpartum hemorrhage (PPH),

which is blood loss greater than 500 mL after a vaginal delivery or 1000 mL after a cesarean delivery, remains one of the biggest killers of women and causes a significant amount of morbidity globally (1). The relationship between body mass index (BMI) and PPH risk has been of great focus, and research shows that obese mothers are likely to experience complications during childbirth, including increased bleeding (2). This paper focuses on the cases of complicated PPH among obese women and the possible causes, in addition to the difficulties experienced in preventing the mentioned outcomes from happening in practice.

Excess fat accumulation or obesity, which is defined as a BMI of 30 and above, has numerous challenges during pregnancy and childbirth. Several studies conducted have evidenced that high BMI increases the risk of PPH irrespective of the type of delivery, either cesarean or vaginal (3). Another study noted that obesity is one of the causes of uterine atony, which is a state where the uterus cannot contract after delivery, thus leading to PPHs (4). Furthermore, obesity is associated with co-related comorbidity with other non-surgical factors, including gestational diabetes and hypertension, that enhance the risk of PPH (5). The findings of this research demonstrate that obese women require effective and specific antenatal care so that the worst-case situation can be prevented.

Overweight and obese alter the physiological state of pregnancy, especially in terms of labor and delivery. Overweight causes complications in the mechanical and hormonal signals that are needed for the contractions of the uterus, which has benefits touching on decreasing blood loss among women who are in labor (6). Furthermore, the obstetrics of obese women have been described to experience a higher incidence of labor induction and cesarean section as compared to non-obese women, both of which are recognized factors that predispose women to the development of PPH(7). For instance, a cross-sectional investigation of Chinese women in Guangzhou and Changsha suggested that a significantly increased risk of developing severe PPH was detected in women who were obese (8). Based on these outcomes, delivery methods should receive considerable attention within this population.

On surgical and anesthetic considerations, obesity is an added problem for patients with PPH. A number of studies have indicated that Women who are obese are likely to have increased risks during Cesarean sections, including poor exposure to the surgical site and also longer time required to perform the procedure (9). Furthermore, obesity is a difficult type, and it is a challenge in anesthetic management because it can result in more perioperative bleeding (10). One case-control study contrasted morbid obesity and super-obesity in women and demonstrated that these 2 groups had a significantly higher rate of anesthetic complications that contributed to the numerous factors elevating PPH risk (11). Some of these are most useful in explaining why obese parturients require a multimodal approach to their management.

Obesity also increases the risk of other conditions, such as placenta previa or placenta accreta, which are important predisposing causes of severe PPH (12). A survey that was conducted in South Central Ethiopia revealed that women in this group had more of these complications, hence requiring more elaborate planning and interventions during delivery (13). In the same way, obese women also have a high risk of experiencing PPH in subsequent pregnancies because the degree of placental pathologic changes tends to worsen with subsequent pregnancies (14). This cycle extends the need for preconception clinic visits and weight loss for women of reproductive age who desire to get pregnant. Thus, physiological and surgical risk factors of obesity, in combination with socioeconomic and healthcare availability and utilization factors, are likely to contribute to the development of PPH in obese women. Lack of adequate referral to obstetric care professionals and delayed identification of hemorrhage-predisposing factors may result in unfavorable outcomes among less privileged women (15). In countries such as Pakistan, where health facilities may not expand to meet the increasing burden and the incidence of obesity is rapidly increasing, tackling inequality is crucial in enhancing maternal health. This study concludes that intervention in obese women requires proper healthcare training and resources to address PPH properly.

However, the prevention of PPH in obese women should be a comprehensive approach that includes pre-conception, prenatal, and intrapartum care. Cesarean section can also be encouraged before striving to lose weight or to obtain the perfect body mass index before conception because it reduces

the chances of PPH (1). Screening for gestational diabetes and hypertension should be integral to antenatal visits, and standard protocols for its treatment need to be established to manage complications (2). During labor, proper management of the third stage of labor involving the use of uterotonic agents and surgical interventions should be done to minimize blood loss (3). These strategies have to be tailored to the context of obese women in order to derive the most benefit from its use.

Finally, the factors affecting severe PPH among obese women in the context of delivery are multi-factorial, physiological, surgical, and sociological. The increasing number of women with obesity indicates that this problem must be solved in obstetrics. The Norwegian study identifies several factors that increase risks for obese women during childbirth, and consequently, providers are able to adapt and prevent the occurrence of these problems. More emphasis should be placed on accomplishing research with regards to maternal health and concomitantly increasing funding for the improvement of maternal healthcare so as to have a positive impact on the global well-being of mothers through acting on PPH in special and low-income countries.

Objective: This study aimed to identify the incidence, risk factors, and barriers to management specific to the postpartum period in obese women experiencing severe postpartum hemorrhage following delivery and to propose potential solutions to enhance maternal prognosis.

MATERIALS AND METHODS

Study Design: This study also used the retrospective cohort design to determine the frequency and risk factors for severe PPH among obese women after delivery.

Study setting: Department of Obstetrics and Gynaecology, MTI/ Mardan Medical Complex, Mardan, Pakistan.

Duration of the study: Period of one year from October, 2024 to September 2025.

Inclusion Criteria

The samples comprised women with a pre-pregnancy BMI of ≥30, who delivered at the study site within the specified time frame. Also, the decision of choosing between a normal and a cesarean section was made. All participants must have complete medical records regarding their deliveries and any postpartum patient information for proper analysis. Both single-pregnant and multiparous women were recruited in the study as long as no significant congenital malformation was noted in the fetus.

Exclusion Criteria

Patients who have a BMI of less than 30, incomplete medical records, those who delivered outside the facilities of the study were eliminated. Women with antepartum hemorrhage equal to or greater than 200 mL, placenta previa, or placenta accreta diagnosed prior to delivery were excluded to capture only PPH that could be directly attributed to obesity. Female candidates with coagulopathies or malignancies were also excluded, as these could have confounding effects on the study outcome.

Methods

The data for this study were extracted from medical records of women who delivered in Department of Obstetrics and Gynaecology, MTI/ Mardan Medical Complex, Mardan, Pakistan, from January 22-December 2023. The research was conducted on women who had a pre-pregnancy Body Mass Index (BMI) of 30 or more. Covariates comprised maternal age, parity, previous pregnancy complications, mode of delivery, BMI at booking, and postnatal events. PPH was identified as blood loss over 1000 ml regardless of the mode of delivery clinically or as recorded in surgical notes. This data was exclusively extracted and later reviewed by the trained obstetricians to enhance completion perfection. Data were analyzed using SPSS software, where basic descriptive statistics for the baseline characteristics were done. In this regard, logistic regression analysis was used to determine factors

determining severe PPH with considerations made to the confounding factors of age, parity, and co-morbidity. The study was approved by the hospital research ethics committee and patients' anonymity was ensured during the study.

RESULTS

For the purpose of this study, the medical records of 1200 obese women who delivered at Department of Obstetrics and Gynaecology, MTI/ Mardan Medical Complex, Mardan, Pakistan during this period were reviewed. The frequency of severe PPH was revealed to be 18% (n=216) of the total cases. The findings are described in terms of patients' demographics, clinical conditions, and delivery processes, as well as potential causes for severe PPH.

Patient Characteristics

Table 1 presents the demographic data of the participants in the study. The participants were relatively young, with a mean age of 30.5 ± 4.2 years, with the majority (68.3%) being multiparous women. The mean BMI was about 34.8 kg/m² (±4.1), and the majority of participants (60%) were categorized as obese (30–34.9 kg/m²), while a fraction of the participants 40% were morbidly obese (35 kg/m² and above). Morbidly obese women had a 26% incidence of severe PPH as compared with the obese women who had 13%.

Variable	Severe PPH (n=216)	No PPH (n=984)	p-value
Mean Age (years)	32.1 ± 4.5	30.2 ± 4.1	<0.05
Multiparity (%)	78.2	66.5	<0.05
Morbid Obesity (%)	40.3	27.1	<0.01

Delivery Methods

The delivery methods distribution is also revealed in the table 2. It was further noted that 58% (696) of the deliveries were by cesarean section, while 42% (504) were by vaginal deliveries. At the same time, 22.4% of the women who underwent a cesarean section experienced severe PPH as compared to those who delivered vaginally (11.5%). In cesarean sections, elective cases were found to have a higher PPH rate (28%) than the cases of emergency cesarean sections (19.5%).

Delivery Method	Total Cases (n=1,200)	Severe PPH (n=216)	Incidence (%)
Vaginal Delivery	504	58	11.5
Cesarean Section	696	156	22.4
Elective Cesarean	250	70	28.0
Emergency Cesarean	446	86	19.5

Risk Factors

Table 3 displays the baseline demographic characterization and independent predictors of severe PPH using multiple logistic regression analysis. They also identified morbid obesity (OR 3.2; 95% CI 2.5–4.1), prolonged labor (OR 2.8; 95% CI 2.1–3.7), and preeclampsia (OR 2.5; 95% CI 1.9–3.4) as the strongest predictors. Other contributory factors were maternal age and induction of labor.

Risk Factor	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Morbid Obesity	3.2	2.5–4.1	<0.001
Prolonged Labor	2.8	2.1–3.7	<0.001
Preeclampsia	2.5	1.9–3.4	<0.001
Advanced Maternal Age	1.9	1.4–2.6	<0.01

Risk Factor	Odds Ratio (OR)	95% Confidence Interval (CI)	p-value
Labor Induction	1.7	1.3–2.2	<0.01

Morbid obesity, cesarean delivery, preeclampsia, and prolonged labor were other factors reported to be the causes of Severe PPH in this study. These findings point to the need for proper risk management intervention for obese pregnant women in order to prevent negative maternal complications.

DISCUSSION

According to the study outcomes, the link between obesity and increased odds of severe PPH should be considered to be an important issue requiring prompt intervention in obstetrics. Severe PPH was reported in 18% of the sample, and it is known to be a major cause of maternal morbidity and mortality globally. In the context of prior literature, the discussion delves into the consequences of these findings and proposes possible directions for enhancing maternal outcomes. Excessive body fat accumulation, known as obesity, is documented to cause numerous obesogenic complications during childbirth, among which is PPH. The higher percentage of women developing severe PPH in this study among morbidly obese women also resonates with prior literature indicating that greater BMI worsens maternal risks during and following childbirth (1, 2). Hemodynamic changes relative to obesity: changes in blood flow distribution, increase in blood volume, and decreased contractility of the uterus are likely to play a role in the increased bleeding (3). Such factors put into perspective why obesity as a risk factor in preconception care and maternal health should be addressed.

It was revealed that cesarean section was more closely linked with having more severe PPH than vaginal delivery, especially in the case of elective surgeries. This finding is in agreement with other studies showing that cesarean delivery is a risk factor for PPH on its own (4). Additional surgical risks that are linked to obesity include longer operation times, problematic coagulation, and anesthesia issues, especially in obese women (5). Elective cesarean sections, which are conducted to decrease various risks of labor in massively obese women, raise the risk of PPH because of the procedure being surgical and primary pathology in women who require it (6). Maternal age and BMI were not found to have any association with severe PPH in the present study, and neither did parity, which only had a borderline significance level in this study, show any relationship with severe PPH in this sample of women. These findings support previous research that included these factors in the list of key causes of hemorrhagic complications (7, 8). Although preeclampsia is known to affect the blood vessels and coagulation system due to endothelial dysfunction, it increases the risk of postpartum hemorrhage during delivery. Likewise, cases of prolonged labor and labor induction are more common among obese women, and these are some of the contributing factors to uterine atony, which is a major cause of PPH (9). Such findings corroborate the importance of continued surveillance and intervention of labor to prevent hemorrhage complications in obese women.

A higher proportion of women who are obese experience severe PPH, attributed to the accumulation of placenta previa and placenta accreta, all of which are known to occur with increased frequency in the obese population (10). An abnormal placenta not only contributes to the increased bleeding rate during delivery but also makes surgical intervention much more difficult to control bleeding, hence requiring skilled techniques and amenities to control bleeding (11). The persistence of PPH in subsequent pregnancies, especially among women with obesity-related complications and disparities in postpartum follow-up, supports the call for enhanced postpartum education for these women. From this healthcare delivery perspective, the study highlights hardships involved in managing PPH in developing country contexts like Pakistan. Obesity has been associated with suboptimal outcomes due to restricted proper obstetric care, delayed identification of at-risk patients, and lack of appropriate training in the prevention and management of PPH. To overcome these disparities, there must be investments focused on healthcare that provide uterotonic agents and blood transfusion services besides training obstetric care service providers (12). Furthermore, practices that involve the identification and care of women at high risk of PPH should be implemented in order to reduce the occurrence of PPH in LMICs.

Strategies for the prevention of PPH related to obesity must necessarily be multipronged and multifaceted. Obesity needs preconception and weight loss management to minimize complications and enhance health status. A pre-pregnancy BMI has been shown to be related to better pregnancy outcomes with a healthy BMI reducing the risk of PPH (13). Several complications, including gestational diabetes and preeclampsia, which are common in obese women, should be identified and controlled during antenatal care for a woman in order to decrease the risk of PPH (14). Extrapartum approaches that are aimed at the prevention of PPH include proactive management of the third stage of labor and personalized mode of delivery (15). The study also reveals that the issue of obesity in pregnant women calls for interdisciplinary intervention. Obstetrics and anesthesia specialists and other members of the clinical team should use a multidisciplinary approach when dealing with this high-risk category. For instance, the management of anesthesia in obese women is complex mainly due to conditions such as the risk of difficult intubation and increased chances of bleeding throughout the process of cesarean delivery (6). Likewise, surgical teams must be prepared for obstacles of obesity such as extra padding and poor exposure of target locations (5).

However, the study has certain limitations that need to remain while discussing the above findings related to obesity and severe PPH. The study used cross-sectional and retrospective design, and this could led to selection bias since data was obtained from records. However, the study lacked control over some factors, including the socioeconomic status and lifestyles of the mothers. Therefore, future research should focus on using finally prospective designs and include a wider range of variables in order to establish a fuller depiction of the dynamic relationship between obesity and PPH. Finally, the research shows that obese women are at risk of developing severe PPH and indicates that the problem has multiple causes. The rates of obesity and perceived complications such as cesarean section delivery, preeclampsia, and prolonged labor increase the risk of hemorrhage. Such changes entail a hierarchical model of care, focusing on pre-conceptual advice, individualized preventative maternity care, and interprofessional collaboration in childbirth. This strategy addresses therapeutic needs and focuses on the prevention of severe PPH for obese pregnant women to enhance their outcomes in low-resource healthcare facilities.

CONCLUSION

The findings of this thesis emphasize the strong relationship that exists between obesity and severe PPH and underline the paramount importance of developing effective interventions aiming at improving maternal health. The study shows that women who are from the obese and morbidly obese category are at a higher risk of developing PPH as a result of factors such as Cesarean delivery, preeclampsia, Prolonged labor, and Abnormal placentation. This rise in PPH rate in the current generation emphasizes pre-conception weight control, parish care during pregnancy, and proper monitoring during labor. The management of the problems related to PPH in obese women also involves a team approach that involves obstetrics, surgery, and anesthesiology. For health care delivery in low resource setting, there is the need for training, development of infrastructure, and practice guidelines. Therefore, with the use of proper strategies that focus on preventing the risk factors of severe PPH, maternal safety, as well as the health of obese women during and after childbirth, will be enhanced.

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