

FREQUENCY OF PPH IN OBESE NULLIPAROUS PATIENTS WITH STANDARD PROPHYLACTIC DOSE OF OXYTOCIN DURING EMERGENCY C-SECTION

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Abstract

Objective:

To determine the frequency of PPH in obese nulliparous patients with standard prophylactic dose of oxytocin during emergency c-section.

Methods:

In this cross-sectional study, we included 97 women of gestational age >36 weeks, having BMI ≥ 30 Kg/m² who underwent emergency cesarean section in Lady Aitchison Hospital, Lahore, from 8 March 2025 to 10 June 2025. Oxytocin was given intravenously (20 IU) as a bolus over a one-minute period, immediately following the delivery of the fetus's anterior shoulder. The occurrence of postpartum hemorrhage (PPH) was carefully evaluated and recorded.

Results:

The mean age of patients was 28.6 ± 5.8 years. Mean gestational age was 38.09 ± 1.32 weeks. Out of 97 patients, PPH was diagnosed in 6 (6.19%) patients.

Conclusion:

The frequency of PPH in obese nulliparous patients receiving standard prophylactic dose of oxytocin during emergency c-section was 6.19%.

INTRODUCTION

Postpartum hemorrhage (PPH) is a significant contributor to maternal mortality during childbirth, with more than 80,000 fatalities reported globally in 2015.¹ A systematic review determined that the worldwide prevalence of PPH stands at 10.8%, while the rate of severe PPH, characterized by blood loss of 1000 ml or more, is approximately 2.8%.² In recent years, high-income nations have witnessed a rise in PPH cases, with a considerable number linked to uterine atony.^{3, 4}

Over the past twenty years, the global incidence of obesity has seen a concerning increase. Pakistan is currently confronting a dual challenge regarding this health issue, grappling with both under-

nutrition and underweight individuals alongside a swift rise in obesity and overweight rates, especially within urban areas. Numerous population studies indicate that women who are obese face a higher likelihood of experiencing postpartum hemorrhage or atonic hemorrhage.⁵

A higher body mass index (BMI) has been linked to a greater likelihood of complications during pregnancy, including pre-eclampsia, gestational hypertension, larger-than-average babies (macrosomia), and higher rates of both induced labor and cesarean sections. The BMI serves as a straightforward measure of weight relative to height. A survey conducted in Pakistan revealed that

postpartum hemorrhage (PPH) was responsible for 27.2% of maternal mortality in the country.⁶ Additionally, research indicates that PPH remains the leading cause of death among pregnant women in Pakistan.⁷

An essential aspect of preventing postpartum hemorrhage (PPH) is the proactive use of uterotonic medications. The administration of oxytocin during the third stage of labor is effective in decreasing blood loss and reducing the reliance on further uterotonics. To limit potential side effects, it is crucial to utilize the smallest effective dosage necessary for promoting sufficient uterine contractions.⁸

The aim of present study was to determine the frequency of PPH in obese nulliparous patients with standard prophylactic dose of oxytocin during emergency c-section.

METHODS:

In this cross-sectional study, we included 97 women of gestational age >36 weeks, having BMI ≥ 30 Kg/m² who underwent emergency cesarean section in Lady Aitchison Hospital, Lahore, from 8 March 2025 to 10 June 2025. The additional inclusion criteria were cephalic presentation, singleton pregnancy, and nulliparous women. Women with abnormal fetal presentation, placenta previa, pre-eclampsia, or gestational diabetes were excluded. Written consent was obtained from each woman.

All patients received a standardized dosage of oxytocin based on the recommendations of the clinicians and the protocols in place at the hospital. Central neuraxial anesthesia was administered using one of three techniques: single-shot spinal, combined spinal-epidural, or epidural. Each woman was provided with standard antibiotic prophylaxis along with a co-load of Ringer's lactate at a rate of 10 ml/kg (up to a maximum of 1 liter)

when the block was initiated. A sensory level of T4 was achieved bilaterally prior to making the skin incision. To enhance the local anesthetic, fentanyl (administered intrathecally at doses of 10–15 µg or epidurally at 50–100 µg) and morphine (100 µg intrathecally or 2.5 mg epidurally) were utilized. The patients were positioned supine with uterine displacement to the left, aided by a wedge placed under the right buttock. Standard monitoring techniques were implemented, which included a five-lead ECG, non-invasive blood pressure monitoring, heart rate assessment, and pulse oximetry. Blood pressure measurements were taken every minute from the start of the regional anesthesia until the conclusion of the study period, followed by checks every 2.5 minutes thereafter. Systolic blood pressure was maintained through the administration of 6 µg doses of noradrenaline, with ephedrine (5–10 mg) available for use if necessary. Oxytocin was given intravenously as a bolus over a one-minute period, timed precisely with a stopwatch, immediately following the delivery of the fetus's anterior shoulder. A uniform dose of 20 IU of Oxytocin was administered to all patients in the study. The occurrence of postpartum hemorrhage (PPH) was carefully evaluated and recorded. According to the American College of Obstetricians and Gynecologists (ACOG) criteria, PPH was defined as blood loss of 1000 ml or more, accompanied by clinical signs of hypovolemia such as hypotension. Any case meeting these criteria was classified as postpartum hemorrhage.

RESULTS:

The mean age of patients was 28.6 ± 5.8 years. Mean gestational age was 38.09 ± 1.32 weeks. Out of 97 patients, PPH was diagnosed in 6 (6.19%) patients.

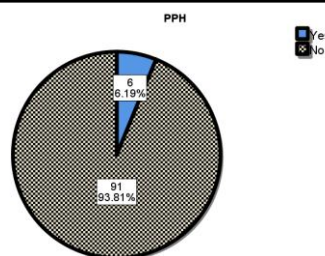


Figure 1. Frequency of PPH.

DISCUSSION:

The negative impacts of a rising BMI on both mothers and their babies are well documented. Many researchers have reported that overweight or obese women often experience prolonged labor that doesn't function properly, resulting in higher cesarean section rates and a greater risk of infections after delivery.^{9, 10} Studies also indicate that increasing BMI negatively affects newborns, leading to lower cord pH levels, as well as higher incidences of stillbirths, shoulder dystocia, and reduced Apgar scores.^{11, 12}

The precise reasons behind the increased likelihood of dysfunctional labor in women with obesity remain unclear. Several studies suggest biological plausibility, with one potential factor being changes in the volume of distribution.¹³ Although our current understanding of how obesity affects this parameter is limited, existing evidence indicates that the volume of distribution varies significantly among obese individuals and is more challenging to predict compared to those of normal weight.¹⁴ Additionally, myometrial dysfunction and hormonal disparities may contribute to labor issues, possibly through impairing the normal response to oxytocin.¹⁵

In our study, PPH occurred in 6.19% obese patients who underwent emergency CS and received oxytocin. Subramaniam et al. conducted a study on the frequency of post-partum hemorrhage (PPH) in patients receiving a standard prophylactic dose of oxytocin and reported PPH in 6.7% obese

patients.¹⁶ Another study by El Behery et al. reported PPH in 13.3% obese pregnant women receiving standard prophylactic dose of oxytocin.¹⁷

Research involving in vitro analysis of myometrial tissue has indicated that both the strength and the

speed of uterine contractions tend to be diminished in women with obesity compared to those of normal weight.¹⁸ Additionally, leptin—a hormone with an inhibitory impact on the myometrium—is produced by fat tissue, leading to its elevated levels in individuals with higher BMI.¹⁹ There is also evidence suggesting that the expression and function of the oxytocin receptor may be altered, as genetic variations in the oxytocin receptor gene can influence how the uterus responds during labor.²⁰ Moreover, studies have observed that with increasing BMI, there is often an upregulation in oxytocin receptor levels coupled with a reduction in receptor sensitivity.²¹

This study has certain limitations. Since it is an observational study, it cannot establish cause-and-effect relationships. Additionally, some outcomes potentially linked to increased oxytocin usage, such as shoulder dystocia, were not examined or reported.

CONCLUSION:

The frequency of PPH in obese nulliparous patients receiving standard prophylactic dose of oxytocin during emergency c-section was 6.19%.

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