

## EFFICACY OF UTERINE PACKING AND INTRAUTERINE BALLOON TAMPONADE IN ATONIC POSTPARTUM HEMORRHAGE COMPARISON

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**Abstract:** A randomized controlled trial was conducted between March 1, 2023, and September 1, 2023, at the Gynae unit of the Mardan Hospital complex in Mardan. The study aimed to evaluate the effectiveness of two strategies in treating postpartum hemorrhage caused by atony. The two strategies evaluated were uterine gauze packing and uterine balloon tamponade. A total of 168 women who had experienced postpartum hemorrhage due to uterine atony after a vaginal birth were enrolled in the study through non-probability sampling. Patients with clotting disorders, trauma-related hemorrhage, and those who had undergone cesarean deliveries were excluded from the study. The study had two groups of patients, with 84 patients enrolled in group A and 84 in group B. The study aimed to compare the effectiveness of the two strategies in minimizing blood loss in the first 24 hours following birth. The study found that uterine balloon tamponade was more effective in reducing postpartum hemorrhage caused by uterine atony than uterine gauze packing. Specifically, 75 (89.3%) patients in group A reported the effectiveness of uterine balloon tamponade, while uterine gauze packing was reported in 61 (72.6%) patients in group B. This difference in effectiveness was statistically significant ( $P=0.006$ ). The Chi-square test was used to compare the two groups, with a  $P$  value of 0.05 considered significant. In conclusion, the study suggests that uterine balloon tamponade is more effective in reducing postpartum hemorrhage caused by uterine atony than uterine gauze packing.

**Keywords:** Postpartum Hemorrhage, Urinary Atony, Balloon Tamponade

### Introduction

Over 500 milliliters of blood lost within 24 hours following delivery is postpartum hemorrhage—one of the leading causes of physical, mental, and fatal sickness (Oladapo et al., 2016). OB hemorrhage may cause 25% of maternal deaths. Hemorrhage kills 13.4% of mothers in high-income countries, 35% in Africa, and 32.9% in Asia (Khan et al., 2006). Overall, PPH is 8%. Bleeding kills about one-third of the 300,000 women who die during pregnancy and delivery annually. Poor countries may have 25% (Gyamfi-Bannerman et al., 2018). Multiparity, numerous pregnancies, fetal macrosomia, polyhydramnios, antepartum bleeding, induction, protracted labor, instrumental delivery, and chorioamnionitis increase postpartum hemorrhage risk. Most postpartum bleeding is caused by uterine atony, retained pregnancies, genital tract trauma, and coagulation abnormalities (Sebghati and Chandrahara, 2017). At the baby's anterior shoulder birth, oxytocin is given to actively regulate the third stage of labor. Oxytocin prevents and treats PPH 60% better and uses less harmful substances (Westhoff et al., 2016). Management relies on prompt diagnosis and treatment. Early identification of PPH risk factors before birth, computation of blood loss after delivery, clinical patient monitoring, and coagulopathy tests enhance clinical diagnosis (No, 2016). Teamwork may lower pph morbidity and mortality regardless of the cause (Evanson and Anderson, 2014). First, pharmacological treatment includes intravenous fluids, blood transfusions, uterine massages, and oxytocin. Before a diagnosis, uterine packing, balloon tamponade, and B-lynch compression sutures may save the uterus. Early

hysterectomy is the initial therapy for life-threatening bleeding (Anderson and Etches, 2007). Compared to other treatments, uterine balloon tamponade is inexpensive and doesn't need sophisticated equipment or training in low-resource settings. Mechanical methods decrease uterine blood flow by pushing on blood arteries. Packing or inflating a balloon within the uterus helps reduce blood loss. Data on uterine balloon tamponade's usefulness in treating PPH is unclear (2009). Multiple studies have shown that uterine balloon tamponade is an effective initial surgical treatment for PPH following pharmacological treatment (Dildy et al., 2014). The RCOG recommends balloon tamponade for uterine atony and placental site anomalies to reduce bleeding. Balloon tamponade is a safe, effective, and easy way to treat primary postpartum hemorrhage (Martin et al., 2015; No, 2016). Hysterectomy was 75% less likely with gauze uterine packing (Schmid et al., 2013). I wish to compare Foley catheter-based uterine balloon tamponade versus gauze-based uterine packing for atony-related PPH.

### Methodology

From April to September 2023, the Mardan Medical Complex Gynae B unit conducted a randomized controlled experiment with hospital ethics committee permission. The sample size for each group was 84, with a 5% margin of error, 95% confidence, and 80% power. PPH frequency decreased by 63.7%, and balloon tamponade decreased by 42.2% with uterine packing. Sequential non-probabilistic sampling was utilized. All singleton pregnant women aged 18–40 with a gestational age of 37–41 weeks with PPH after

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vaginal delivery were enrolled in the experiment. C-section births, medical record coagulation abnormalities, and PPH were excluded from the experiment.

Informed permission from qualified patients was obtained, clinical and demographic details were noted, and blood loss within the first 24 hours after the delivery was measured as part of the data-collecting process. Pharmacological treatments were given by protocol. A standardized proforma was used to collect data, and statistical analysis was done to determine the results.

The collected data will be analyzed using SPSS version 23. Mean plus standard deviation will be presented for quantitative data such as Age, parity, gestational Age, and BMI. To compute the frequency and percentage of qualitative variables like efficacy and parity in both groups, use the Chi-square test with a significance threshold of  $p < 0.05$ . BMI, Age, parity, and gestational Age will be stratified. A chi-square test after stratification was statistically significant if the p-value was less than 0.05.

**Results**

Adults aged 18–35 participated in the research. Table I displays average weights and ages for each group: 66.345±3.86 kg for Group B, 38.511±1.39 weeks for gestation, and 67.547±5.16 kg for Group A, representing 27.452±2.76 years. Table II demonstrates that 75 (89.3%) patients in group A and 61 (72.6%) in group B were efficacious (P=0.006). Table III shows how Weight, parity, and gestational age affect efficacy in both groups.

**Table No.1: Demographic of patients**

Characteristics	Group A (Balloon Tamponade)	Group B (Gauze Packing)
Number of Patients	84	84
Age Range (years)	18 to 35	18 to 35
Average Weight (kg)	67.547±5.16	66.345±3.86
Gestational Age (weeks)	38.511±1.39	N/A
Average Age (years)	27.452±2.76	27.452±2.76

**Table No. 2: Efficiency Evaluation of the Two Groups**

		Group A	Group B	Total	P-value
Efficiency	Yes	75 (89.3%)	61 (72.6%)		0.0062
	No	9 (10.7%)	23 (27.4%)		
Total		84	84	168	

**Table No.3: Differential Efficacy Based on Age, Gestational Age, and Body Mass Index**

Age	Efficiency	Group A	Group B	P-value
18-30 yrs	Yes	62 (98.4%)	59 (80.8%)	0.001
	No	1 (1.6%)	14 (19.2%)	
>35 yrs	Yes	13 (61.9%)	2 (18.2%)	0.019
	No	8 (38.1%)	9 (81.8%)	
Gestational Age 37-39 weeks	Yes	52 (88.1%)	46 (67.6%)	0.006
	No	8 (8%)	1 (6.2%)	
Parity Primi	Yes	58 (98.3%)	56 (80%)	0.001
	No	1 (1.7%)	14 (20%)	
Multi	Yes	17 (68%)	5 (35.7%)	0.051
	No	8 (32%)	9 (64.3%)	
BMI 19-24	Yes	66 (98.5%)	59 (80.8%)	0.000
	No	1 (1.5%)	14 (19.2%)	
>24	Yes	9 (52.9%)	2 (18.2%)	0.066
	No	8 (47.1%)	9 (81.1%)	

**Discussion**

The Cochrane-based comprehensive analysis found that intrauterine tamponade may increase total blood loss > 1000 mL, showing that balloon tamponade does not prevent PPH mortality or morbidity. The RCTs compared mechanical/surgical primary PPH treatments to routine care or another therapy. The balloon tamponade group in our study succeeded by 89% (Pregnancy et al., 1996).

Ashraf and colleagues conducted a short study comparing uterovaginal packing to intrauterine balloon tamponade, which employs a condom-filled catheter. Uterine tamponade worked in 82 (77.4%) instances, and gauze pads were used in 63 (59.4%) of the control group, according to our study (Ashraf et al., 2018). Similar results were seen in our Study (Tirumuru et al., 2013). BT had a higher

effectiveness rate (89.3%) than gauze packing (72.6%) in Tirumuru et al.'s UK trial.

Gao Y et al. found that 102 Bakri balloon-implanted patients had hemostasis. Bakri balloon hemostasis operations were 93.6% (102/109) successful and 6.4% (7/109) unsuccessful (Gao et al., 2014). A separate experiment found similar percentages of successful hemostasis in gauze and catheter groups (93.1% vs. 91.2%). Jing Wei et al. Women in the catheter group had a substantially reduced incidence of PPH ≥1000 ml (42.2%) and less blood loss within 24 hours postpartum (895 [612.3-1297.8] vs. 1156 [882.5-1453.3] ml, P <.01). Thus, catheterized women had decreased rates of postpartum anemia, puerperal morbidity, and pain (Wei et al., 2020).

Yuna Gua et al. found that 99 of 318 c-section patients received uterine gauze packing, and 66 received balloon

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tamponade for prolonged bleeding. The UBT group got 87.88% success, and the UGP group 90.91. Only one UBT patient underwent a hysterectomy. In contrast, our balloon tamponade group succeeded more (Guo et al., 2015).

Of the 78 patients in the retrospective cohort Study at Charité, Berlin's university hospital, 47 (60.3%) chitosan-covered gauze tamponade and 31 (39.7%) balloons. There was no statistically significant difference in the two groups' efficacy. Atonic hemorrhage caused PPH. Three balloon tamponade patients needed hysterectomy. A hysterectomy was unnecessary in the gauze group (Dueckelmann et al., 2019).

Makosso et al. found that 99 people got intrauterine mesh daily at a French hospital. Mesh success was 20.91 percent. Compared to our results, the success rate was higher (Makosso et al., 2014).

As a conservative therapy for placenta previa/accreta-related postpartum hemorrhage, Al Harbi et al. used utero-vaginal packing alone in 48 of 83 patients. None of the mothers died, although three needed further surgery (Nawal A et al., 2009).

## Conclusion

Our Study found that uterine balloon tamponade is a safe and effective mechanical method for avoiding uterine atony-related postpartum hemorrhage with a high success rate. Randomized and nonrandomized trials on uterine balloon tamponade offer conflicting outcomes. Experimental investigations demonstrate no improvement over observational studies. However, affordable and accessible methods allow life-saving mechanical surgeries like balloon tamponade, which arranges blood infusions and prepares patients for hysterectomy.

## Declarations

### Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

### Ethics approval and consent to participate

Approved by the department Concerned.

### Consent for publication

Approved

### Funding

Not applicable

## Conflict of interest

The authors declared absence of conflict of interest.

## Author Contribution

### NABILA KHAN

Conception of Study, Development of Research Methodology Design, Study Design,, Review of manuscript, final approval of manuscript

Data entry and Data analysis, drafting article

Data acquisition, analysis.

### KOMAL ALI

Manuscript revisions, critical input.

Coordination of collaborative efforts.

Data acquisition, analysis.

Coordination of collaborative efforts

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