EFFICACY OF UTEROVAGINAL PACKING VERSUS UTERINE BALLOON TAMPONADE TO CONTROL POSTPARTUM HEMORRHAGE DUE TO UTERINE ATONY

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ABSTRACT

OBJECTIVES

To determine and compare the efficacy of Uterovaginal packing versus uterine balloon tamponade to control postpartum haemorrhage due to uterine atony unresponsive to medical treatment.

METHODOLOGY

This comparative prospective cross-sectional study was conducted in Hayatabad Medical Complex, OBG department. A total of 140 patients were categorised into two groups, group A underwent Uterovaginal packing and group B underwent uterine balloon tamponade. All women of 18 to 40 years with a history of delivery after 28 weeks of gestation, who developed primary postpartum haemorrhage due to uterine atony, unresponsive to medical treatment were included in the study. Women with a history of delivery before 28 weeks of gestation, secondary postpartum haemorrhage, genital tract trauma, retained placental tissue and membranes, placenta previa, morbidly adherent placenta, febrile illness and uterine structural lesion were excluded from the study. Efficacy was labelled if there was no ongoing blood loss after the procedure with concomitant hemodynamic stability. All information was recorded in a predesigned proforma, and data were analysed using SPSS Version 22.

RESULTS

Our study included 140 women; 113 had a normal vaginal delivery, and 27 underwent cesarean section. Among cases with normal vaginal delivery, 45 women had Uterovaginal packing, and 68 had uterine balloon tamponade, while among cases of cesarean sections, 25 women had uterovaginal packing and 2 had uterine balloon tamponade. The efficacy of Uterovaginal packing was 90%, and that of uterine balloon tamponade was 87.1%, with no significant difference statistically (p- 0.51). Overall efficacy of both procedures was 88.6%.

CONCLUSION

All orthodontic and non-orthodontic treatment group participants required oral hygiene instructions and had periodontal treatment needs (TN1). The patients requiring scaling and prophylaxis and Oral hygiene instructions (TN 2) were more in the orthodontic treatment group than the non-orthodontic treatment group. A higher percentage of patients requiring complex treatment (deep scaling, root planning and complex surgical procedures), scaling and prophylaxis and Oral hygiene instructions (TN3) belonged to the non-orthodontic treatment group.

KEYWORDS: *Postpartum Haemorrhage (PPH), Uterine Balloon Tamponade (UBT), Uterovaginal Packing (UVP), Uterine Atony, Efficacy.*

INTRODUCTION

Postpartum haemorrhage is considered a major cause of maternal morbidity and mortality worldwide so far.[1] It is one of the five leading causes of maternal mortality in both developed (1/100000 deliveries) and developing countries (1/1000 deliveries).[2] Postpartum haemorrhage is commonly defined as bleeding above 500 ml in vaginal delivery or 1000 ml in cesarean delivery.[3] Another definition of postpartum

haemorrhage is that blood loss is sufficient to cause hypovolemia and shock.[4] A massive postpartum haemorrhage is defined as a blood loss of more than 1500 ml with an incidence of 1%.[5] Estimation of blood loss at delivery is usually subjective and inaccurate, so postpartum haemorrhage should be diagnosed with any amount of blood loss that threatens the hemodynamic stability of the women.[6] The most common cause of primary postpartum haemorrhage is uterine atony followed by genital tract trauma, retained products of conception (placenta and membranes), ruptured uterus, and coagulopathies.[7] The most common consequences of postpartum haemorrhage include hypovolemic shock, disseminated intravascular coagulation (DIC), renal failure, hepatic failure and adult respiratory distress syndrome.[8] Primary postpartum haemorrhage occurs in 4 to 6% of pregnancies and is caused by uterine atony in 80% of cases.[9] The risk factors of uterine atony are fetal macrosomia, multiple gestations, polyhydramnios, multiparity, prolonged, and obstructed labour. Active management of the third stage of labour is recommended for prophylaxis of postpartum haemorrhage, but haemorrhage can occur despite active management of the third stage of labour.[10] Management of intractable postpartum haemorrhage unresponsive to medical treatment, i.e., uterotonics like oxytocin and prostaglandin, necessitates prompt action. To encounter such a refractory postpartum haemorrhage, a well-defined and prudently organised stepwise approach is required, including the administration of drugs and less invasive mechanical interventions followed by further surgical interventions and hysterectomy as the last resort to save the mother.[11] In the 1980s, the idea of using an intrauterine balloon to produce a tamponade effect was introduced. Various types of balloon tamponade have since been shown to produce a similar success rate of up to 91.5%.[12] Commercial balloon devices were expensive and unaffordable for low resource settings; hence as an alternative, Gold Drath in 1983 introduced the use of a foley catheter as a tamponade device to halt postpartum hemorrhage.[13] In a low-resource country, in case of no other available option, Uterovaginal packing with gauze is a common practice to control postpartum haemorrhage. It is an inexpensive, quick, safe and effective method to control postpartum haemorrhage with reported efficacy of 90.9%.[14] Both of these techniques work in two ways. Firstly, directly exerting pressure on the sinuses in the placental bed stops further blood loss. Secondly, it works by placing the uterine vessels on the stretch, which decreases the perfusion pressure and blood loss from the genital tract ultimately.[15] Because of being the least invasive and easily available, these methods could be availed before proceeding to any major surgical intervention.[16] These conservative techniques have a therapeutic as well as a prophylactic role in the management of postpartum haemorrhage. They have an obvious therapeutic role in ceasing blood loss from the genital tract and preventing multiorgan failure and coagulopathy secondary to excessive blood loss and shock, which advocates their prophylactic role. These procedures are also considered justified in settings where "time gain" is the aim for patient's stabilisation and transfer to a well-equipped setup or tertiary care centre. This study aims to determine and compare the efficacy of uterine balloon tamponade (UBT) and uterovaginal packing (UVP).

METHODOLOGY

This comparative prospective cross-sectional study was conducted in the department of Obstetrics and gynaecology, Hayatabad Medical Complex Peshawar. Ethical approval was obtained from Institutional Ethical Review Committee (IERB Ref No: 489/2021). The study was completed within one year, from January 2021 to December 2021. Non Probability consecutive sampling technique was executed to collect cases for this study. The sample size was 140, calculated by an online WHO sample size calculator, keeping 84.7%1 efficacy of uterovaginal packing and 84.1%21 efficacy of uterine balloon tamponade in treating postpartum haemorrhage, 95% confidence interval and 6% margin of error. All women between 18 to 40 years of age included in the study with a history of postpartum haemorrhage due to uterine atony occurring within 24 hours of parturition and not responding to recommended medical treatment(Green top guidelines No:52). Women of any parity with history of confinement after 28 weeks of gestation whether they delivered at a hospital in our department or referred from periphery and outskirts were enrolled for this study. Women with postpartum haemorrhage due to genital tract trauma retained placental tissue and membrane, low-lying placenta, abnormally invasive placenta, coagulopathy (DIC), secondary postpartum haemorrhage, febrile illness and women with uterine structural lesion were excluded from this study. 140 Patients were enrolled based on selection criteria and divided into two groups. Group A opted for uterovaginal packing (UVP), and group B opted for uterine balloon tamponade (UBT), with 70 patients in each group. After a complete evaluation of the case and establishing a diagnosis, the patient's condition with the needed procedure was explained and written informed consent was obtained. The postpartum haemorrhage was diagnosed by blood loss of more than 500 ml (one kidney tray)following vaginal

delivery and more than 1000 ml (two kidney trays) following Cesarean delivery. The blood loss estimation was done by kidney tray (equivalent to 500ml). Baseline investigations like blood group with cross-match, full blood count, coagulation and renal functions were done. Resuscitation was carried out side by side with standard protocols set for such obstetrical emergencies (Green top guidelines No: 52). An experienced and qualified gynaecologist did uterovaginal packing (UVP). Under all aseptic measures in the lithotomy position, a tight uniform packing of the whole uterine cavity was done with the help of sponge-holding forceps or fingers, using sterilised gauze of variable length (6 to 10m). Uterovaginal packing was started from the fundus up to the full vagina to maintain the pressure. The vaginal route was used to perform Uterovaginal packing in women who developed postpartum haemorrhage after vaginal delivery. In cases of cesarean sections, uterine packing was done with the help of fingers after securing angles of the uterine wound, and at the end of cesarean section, vaginal packing was accomplished to maintain the effect. It was labelled as effective if blood loss was arrested, hemodynamic stability persisted, and the absence of haemorrhage following removal of the pack after a specified interval, i.e., after 24 hours. Injectable antibiotics were offered for 3 to 5 days. Patients with Postpartum haemorrhage not responding to medical treatment and undergoing uterine balloon tamponade were categorised in group (B). After aseptic measures, two sterile foley catheters were inserted so that the first bulb occupying the upper uterine segment and the successive bulb of foley's catheter occupying the lower uterine segment was retained with a total of 300 ml of normal saline. Uterine balloon tamponade was labelled as effective in terms of no bleeding or blood loss < 100ml after insertion, and persistent hemodynamic stability was ensured by intermittent monitoring of the patient in the high dependency unit. Balloon tamponade was retained for 24 hours. Injectable antibiotics were administered for 3 to 5 days. Both procedures were abandoned in case of patient deterioration, and timely recourse to other surgical procedures was considered, as timing is the essence of this management. All data were entered in predesigned performa and analysed on SPSS version 22. Frequencies and percentages were calculated for the mode of delivery, booking status and effectiveness of the procedure. The Chi square test was applied to see the difference by taking a P value less than 0.05 as significant.

RESULT

During the study period, a total of 14000 deliveries were conducted in the OBG department. The frequency of postpartum haemorrhage amongst them was 4.5%. 90% of these cases were due to uterine atony, which mostly responded to recommended medical treatment. We restricted our focus to refractory postpartum haemorrhage secondary to uterine atony, so women with refractory postpartum haemorrhage were randomly offered uterovaginal packing and uterine balloon tamponade. Among group A (UVP), 90% and group (UBT), 87.1% of cases were successfully managed, and patients rest were treated with other surgical procedures, including hysterectomy. This study had no maternal demise due to obstetric haemorrhage or its management. Moreover, none of our patients developed any signs of infection in either group. The overall efficacy of these techniques was 88.6%, and the statistical difference between the groups was insignificant. (P-0.51).

Table 1: Success Rate of Both Techniques Concerning Demographic and Obstetric Characteristics

Characteristics / Variable		Study Group			Success Rate			P-Value
		Group A (UVP)	Group B (UBT)	Total	Group A (UVP)	Group B (UBT)	Total	
Age	18 - 30	27 (38.6 %)	20 (28.6 %)	47 (33.57%)	25 (35.7%)	17 (24.3%)	42 (30%)	0.8601
	31 - 40	43 (61.4 %)	50 (71.4 %)	93 (66.43%)	38 (54.3%)	44 (62.83%)	82 (58.6%)	
Parity	Primipara	22 (31.42%)	25 (35.71%)	47 (33.57%)	20 (28.6%)	22 (31.4%)	42 (30%)	0.6327
	Multipara	48 (68.6%)	45 (64.3%)	93 (66.43%)	43 (61.4%)	39 (55.7%)	82 (58.57%)	
Period of Gestation	> 37 weeks	54 (77.14%)	62 (88.57%)	116 (82.56%)	50 (71.43%)	55(78.6%)	105 (75%)	0.8730
	< 37 weeks	16 (22.86%)	08 (11.43%)	24 (11.43%)	13 (18.57%)	06 (8.6%)	19 (13.6%)	
Mode of Delivery	Vaginal Delivery	45 (64.3%)	68 (97.14%)	113 (80.71%)	40 (57.14%)	59 (84.28%)	99 (70.7%)	0.9774
	C/Section	25 (35.7)	02 (2.86%)	27 (19.3%)	23 (32.86%)	02 (2.86%)	25 (17.85%)	
Residence	Rural	52 (74.3%)	43 (61.4%)	95 (67.86%)	46 (65.7%)	40 (57.4%)	86 (61.4%)	0.1521
	Urban	18 (25.7%)	27 (38.6%)	45 (32.14%)	17 (24.3%)	21 (42.86%)	38 (27.14%)	
Booking	Yes	28 (40%)	30 (42.86%)	58 (41.4%)	28 (40%)	29 (41.4%)	57 (40.7%)	0.121
	No	42 (60%)	40 (57.14%)	82 (58.6%)	35 (50%)	32 (45.7%)	67 (47.8%)	

Table 2: Efficacy of Both Techniques

Efficacy	Study Group		Total	P-Value
	Group A (UVP)	Group B (UBT)		
Successful	63 (90%)	61 (87.14%)	124 (88.6%)	0.512
Failed	07 (10%)	09 (12.86%)	16 (11.4%)	

DISCUSSION

In our study, the procedure's efficacy is slightly higher in uterovaginal packing compared to uterine balloon tamponade (90% versus 87.14%) with no significant difference (p-0.51) statistically. Our study reported that 80.76% of normal vaginal delivery cases suffered from postpartum haemorrhage, whereas 19.3% of cases of Caesarean Section experienced postpartum haemorrhage. All women diagnosed with PPH not responding to medical treatment were offered uterovaginal packing or uterine balloon tamponade after complete evaluation. While discussing the individual procedure of this study, the efficacy of uterovaginal packing was found successful in 90% of cases to control postpartum haemorrhage. Different studies concluded different results with a negligible variation, like the success rate of Pradhan B 84.7%, Qadir M 85% and Renu Jain 85%.[1,8,16] Two studies by Kishwar N and Javed L reported 95.3% and 90.9% success rates, respectively.[2,17]As far as uterine balloon tamponade is concerned, our study concluded its efficacy as 87.14%. A study by Suarez S et al.[18] reported the overall success rate of uterine balloon tamponade as 85.9%. Akhter et al.[19] concluded the success rate of uterine balloon tamponade as 88.8% with no statistical significance when analysed for maternal age, gestational age and parity. A study by Maher MA20 also reported that only uterine balloon tamponade has an 87.5% success rate, which is consistent with our study in terms of efficacy. Similarly, Pala S et al.[21] reported 84.1% efficacy of uterine balloon tamponade, whereas Gauchotte E study had a higher success rate, i. e 92.1%.[22] Another study conducted by Babazhanova and colleague found a success rate of uterine balloon tamponade in the atonic uterus at 88% for controlling postpartum haemorrhage.[23] A comparative study by Rezk M et al.[24] depicted that uterine packing ceased acute bleeding in 93.3% of cases compared to only 68.1% in foley's catheter group(p-<0.05). Another study done by Wei J et al.[12] showed a success rate of 93.1% with uterine balloon tamponade versus 91.2% with intrauterine packing but the difference is not statistically significant, which is consistent with the result of our study. Conversely, Ashraf N reported the efficacy of uterine balloon tamponade as 73.6% and intrauterine packing as 59.4%, which is discordant with the result of our study.[5] Another study by Naeem S et al showing a success rate of 96% vs 84.9% for uterine balloon tamponade and intrauterine packing, respectively.[3] It was a statistically significant success rate (p-0.047) compared to our study (p-0.0.51). In our study comparison of uterovaginal packing and uterine balloon tamponade in postpartum haemorrhage due to uterine atony showed no significant difference between both the study groups. Most of the comparative studies showed a higher success rate in the uterine balloon tamponade group compared to the uterovaginal packing group. However, our study had more successful cases in the uterovaginal packing group, which may be attributed to the experience for years and years in uterovaginal packing. Our study showed that 33.5% of patients were in the age group 18 to 30 years, and 66.4% were in the age group 31 to 40. In our study, 33.57% of women were primiparous, and 66.43% were multiparous women. 82.5% of patients had more than 37 weeks of gestation and 17.14% of patients with postpartum hemorrhage were below 37 weeks. Naeem S et al.[3] study reported that most women (72) had 5 to 7 children, i. e multiparous. In that study, 53.4% of women fell between the age group of 25 to 30 years, and 46.4% were in the age group of 31 to 35. According to Naeem S et al ratio of booked and un-booked cases was 54% vs 46% in the uterine balloon tamponade group and 60.4% vs 39% in the uterovaginal packing group.[3] Overall in that study, booked patients were more in both groups. In contrast, our study had more unbooked cases in both groups (58.6%). Similar results were found in the study of Lohano R et al where booked cases were 28.8%, and unbooked cases were 57.7%.[25] The secret of successful management of postpartum haemorrhage is teamwork within a reasonable time frame. Postpartum haemorrhage is a common and lethal complication of parturition if early diagnosis and required management are not pursued in time. The recommendations are low resource settings or set up with limited surgical expertise should utilise this procedure (UVP /UBT) to prevent multiorgan failure, coagulopathy and mortality by arresting torrential haemorrhage so every obstetrician or trained birth attendant of Maternity services must be trained to encounter an obstetric haemorrhage with these easy and cost-effective procedures.

LIMITATIONS

Research studies with small sample sizes, during a limited period conducted in a single centre, all are limitations of this study and restrict the generalisation of study results. Determination of real burden requires different population-based studies, so multicentric randomised controlled trials should be considered before declaring either method as "Superior" to control

intractable postpartum haemorrhage unresponsive to recommended medical treatment.

CONCLUSION

The study concluded that Uterovaginal packing and uterine balloon tamponade; both are equally effective procedures for control of postpartum haemorrhage caused by uterine atony unresponsive to medical treatment.

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REFERENCES

1. Pradhan B, Laxmi RC, Sharma P, Sing A. Uterovaginal packing as treatment in primary Postpartum Hemorrhage in Patan hospital. Nep J Obstet Gynecol .2016;11(1): 44-6.
2. Kishwar N, Rauf B.Effectiveness of uterovaginal packing in the management of primary Postpartum Hemorrhage.J postgrad med inst .2022;36(2):95-103.
3. Naeem S, Parveen F, Najam H, Memon A. Intrauterine balloon tamponade versus intrauterine packing for treatment of Postpartum Hemorrhage. J Liaqat uni med health sci.2021;1-11.
4. Gadre S, Patel S, Gadre A; An overview of women with Postpartum Hemorrhage in a tertiary care center at capital of Madhya pardesh, India. Int J Reprod contracept obstet gynecol .2016;5:23-8.
5. Ashraf N, Ashraf A, Khursheed K; Efficacy and safety of intrauterine balloon tamponade versus uterovaginal roll gauze packing in patients presenting with primary Postpartum Hemorrhage after normal vaginal delivery. Annals king Edw Med uni .2018;24(s):889-92.
6. Kerr R, Eckert LO, Wini Koff B, Durocher J, Meher S; Fawcus S et al; Postpartum hemorrhage: Case definition and guidelines for data collection, analysis and presentation of immunisation safely data.vaccine.2016; 34(49):6102-6.
7. Edwards HM. Aetiology and treatment of severe postpartum Hemorrhage. Dan M.ed J. 2018 Mar; 65(3):B5444.
8. Qadri M, Amir S; to determine the efficacy of uterine packing in management of primary Postpartum Hemorrhage. JSMC. 2017; 7(2):79-82.
9. Sabir SA, Sultan S. The rate of success in Uterovaginal packing in atonic uterus in the Tertiary care hospital in low resource settings. J Med Science. 2021 July;29(3):96-98.
10. Miller HE,Ansari JR. Uterine atony. Curr opine Obstet Gynecol. 2022 Apr 1; 34(2):82-89.
11. Herrick T, Mvundura M, Burke TF, Abu-Hyder E. A low cost uterine balloon tamponade for management of Postpartum Hemorrhage: Modeling the potential impact on maternal mortality and morbidity in sub saharan Africa. BMC pregnancy and childbirth.2017;17(1):374.
12. Wei J, Dai Y wang Z, Gu N, Ju H, Xu Y, Xu B, Hu Y: Iintrauterine double balloon tamponade vs guaze packing in the management of placenta previa: A multicentre randomised control trial. Medicine (Baltimore). 2020 Feb; 99(7):1-7.
13. Makin J, Suarez-Rebling DI, Varma Shiv kumar P, Tarimo V, Burke TF. Innovative use of condom uterine balloon tamponade for Postpartum Hemorrhage in India and Tanzania. Case Rep Obstet Gynecol .2018 June 3;2018:4952048.
14. ALKreedees N, Asiri M.Uterine packing in the management of postpartum hemorrhage: A mini-Review Articles. Am J Pharmacol There. 2021 Jan 27;5(1):001-002.
15. Gupta M, Mitesh J. Role of condom catheter balloon tamponade in management of Atonic postpartum hemorrhage in cases of failed medical management. Int J Clin Obstet Gynaecol. 2017;1(2):62-64.
16. Dr. Jain R. Role of uterine packing in control of Postpartum Hemorrhage in modern obstetrics: JMSCR .2018;6(8):184-9.
17. Javed L, Munir SI, Eusaph AZ. Effectiveness of uterovaginal packing in management of primary Postpartum Hemorrhage. Annal king Edw Medi univ .2017;23(1):58-62.
18. Suarez S, Conde-Agude lo A, Borovac-pin heiro A, Suarez-Rebling D, Eckardt M, Theron G. Uterine balloon tamponade for the treatment of Postpartum Hemorrhage: A systematic review and meta analysis. AM J Obstet Gynecol. 2020;222(4):293.
19. Akhtar KT, Tabbasum S, Siddique S. Efficacy of balloon tamponade in control of primary Postpartum Hemorrhage. Professional Med J .2020;27(4):717-720.
20. Maher MA, Abdul Aziz A, Comparison between two management protocols for postpartum hemorrhage during cesarean section in placenta previa balloon protocol vs non balloon protocol. J Obstet Gynecol Res.2017;43(3):447-55
21. Pala S, Atilgan R, Baspinar M, Kavak, Yavuzkir S. Akyol A. Comparison of results of Bakri balloon tamponade and cesarean hysterectomy in management of placenta accrete and increta: A retrospective study. J Obstet Gynecol.2018;38(8):1186.
22. Gauchotte E, Torre M. Impact of uterine balloon tamponade on the use of invasive procedure in severe Postpartum Hemorrhage. Acta Obstet Gynecol scand .2017;96(7):877-822.
23. n S.D., Lyubchich A.S., Lyubchich N.I. Efficacy of using controlled uterine balloon tamponade for stopping atonic postpartum hemorrhage // Journal of obstetrics and women's diseases. - 2022. - Vol. 71. - N. 1. - P. 5-10.
24. Lohano R, Haq G, Kazi S, Sheikh S. Intrauterine balloon tamponade for the control of Postpartum Hemorrhage. J Pak Med Assoc.2016;66(1):22-6.
25. Rezk M, Saleh S, Shaheen A, Fakhry T. Uterine packing versus foley's catheter for the treatment of postpartum hemorrhage secondary to bleeding tendency in low-resource setting: A four-year observational study. J Matern Fetal Neonatal Med. 2017 Nov;30(22):2747-2751.

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