

## A PROSPECTIVE STUDY ON PRIMARY POSTPARTUM HAEMORRHAGE IN TERTIARY CARE CENTRE OVER A PERIOD OF 2 YEARS

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### Abstract

**Background:** Atonic PPH is common among high-risk pregnancies. Its incidence can be lowered by universal adoption of AMTSL. Uterine atony is the major cause of primary PPH and a major threat to the life of women in labour and most important cause of maternal mortality. The present study assessed the risk factors, underlying causes, complications, morbidity and various management strategies of primary atonic PPH. **Materials and Methods:** This study was a prospective study conducted in a tertiary care centre over a period of two years from December 2019 to December 2021 on cases with primary atonic PPH at CKMH, Warangal. During this period a total of 8,027 deliveries were conducted. **Result:** Out of 8,027 deliveries, PPH was noted in 171 women. Out of these, in 140 women atonic PPH was noted accounting for 81.37% of all PPH cases. Risk of PPH is higher in both extremes of age i.e. less than 20 years and greater than 40yrs of age. In this study, 42 primigravidae and 98 parous women were noted. 82 unbooked and 58 booked cases were noted. PPH was noted in 56 vaginal deliveries and 84 caesarean sections of which 51 were emergency LSCS and 33 were done electively. The most common risk factor for atonic PPH is anemia, followed by multiparity and preeclampsia. 80 cases responded to uterotonics and uterine massage only, in 33 cases balloon tamponade was effective in controlling PPH, 18 cases needed compression sutures, in 9 cases uterine artery ligation was done and hysterectomy was done in 1 case. Most of the cases were already anemic at the time of delivery, it worsened after PPH. 41 women required transfusion which accounts for 29.2% which was the highest. **Conclusion:** The present study concluded that anaemia is the major risk factor contributing to PPH, followed by multiparity and preeclampsia. Early identification of risk factors and treatment of preventable ones like anaemia, implementation of prevention strategies should be mainstay of management. Avoidance of delay in identification and transfer, identification of high-risk cases and timely transfer and referral to higher centres.

## INTRODUCTION

Postpartum hemorrhage is traditionally defined as the blood loss from the genital tract, exceeding 500mL within 24hrs of vaginal delivery and 1000mL during a cesarean section or 1500mL at cesarean hysterectomy. "PPH is best defined as any amount of blood loss that threatens the hemodynamic stability of the women and necessitates transfusion".<sup>[1]</sup> Alternatively, 10% drop in hematocrit or the need for transfusion in the first 24hrs after delivery is also defined as PPH. PPH is classified as primary PPH, which occurs in the first 24 hrs postpartum and secondary PPH which occurs between 24hrs and 6 weeks postpartum. Primary PPH can be minor (500 mL – 1000mL) and major (>1000mL). Major PPH can further be divided to moderate (loss of 1000mL-

2000mL) and massive (loss of >2000mL or 30-40% of women's blood volume) resulting in changes in women's hemodynamic parameters. PPH accounts for a quarter (24%) of maternal deaths worldwide<sup>1</sup> and its incidence in developing countries is increasing.<sup>[2,3,4]</sup> In developing countries PPH is the single most important cause of maternal death contributing upto 60% of all maternal deaths. According to Confidential Enquiries into Maternal and Child Health (CEMACH) Report, obstetric hemorrhage occurs in around 3.7 per 1000 births with uterine atony being the commonest cause.<sup>[5]</sup> Although there has been significant reduction in number of maternal deaths due to PPH in the United Kingdom, it is sixth leading cause of direct maternal deaths and a significant contributor of maternal morbidity. Primary PPH is commonly due to

abnormalities of one or more of the following processes namely tone which is a non-contracting, atonic uterus is the commonest cause (80%), tissue (3-5%) which is retained products of conception, adherent placenta, trauma (10-15%) which is genital tract lacerations and hematomas, uterine rupture, uterine inversion, thrombin (1-2%) which is coagulation defects or abnormalities. Secondary PPH is commonly due to subinvolution of placental site, retained products of conception, placenta accreta, infection, endometritis, myometritis, parametritis, infection or dehiscence of caesarean scar. Primary Atonic PPH is the most common type accounting for 80% of cases. Hence the need for study on its risk factors, associated morbidity and mortality and its burden on maternal health and health care system.

## MATERIALS AND METHODS

This study was conducted from December 2019 to December 2021 on cases with primary atonic PPH at CKMH, Warangal. Main source of data for this study are booked and unbooked cases. Detail information will be elicited with special reference to parity, nutritional status, blood investigations, amount of blood loss. Careful observation of vitals will be done. Women with blood loss greater than or equal to 500ml after normal vaginal delivery and loss greater than or equal to 1000ml after caesarean section within 24hrs after childbirth, women who are already anemic with blood loss less than 500ml but develop signs and symptoms of hemodynamic instability were included in the present study. Women developing PPH after 24 hrs of childbirth [Secondary PPH], women developing PPH secondary to trauma [traumatic PPH], retained tissue and women with bleeding disorders were excluded in the present

study. Assessment of blood loss was done majorly by visual assessment of blood loss. In addition to it, blood loss during caesarean section was measured using graduated containers. In this method, contamination by amniotic fluid was a limitation. In case of a vaginal delivery and also during caesarean section mops and swabs were used which were measured prior and after soakage to calculate the amount of blood loss.

## RESULTS

A prospective study on primary PPH in a tertiary care centre over a period of two years was conducted from December 2019 to December 2021. During this period a total of 8,027 deliveries were conducted. The incidence of PPH in our hospital was found to be around 2.14%. Out of 8,027 deliveries, PPH was noted in 171 women. Out of these, in 140 women atonic PPH was noted accounting for 81.37% of all PPH cases.

[Table 1] shows that risk of PPH is highest in women aged between 26-30 years(37.5%), followed by women aged 21-25 years (27.5%). Also risk of PPH is higher in both extremes of age i.e. less than 20 years and greater than 40yrs of age. Risk of PPH increases with parity although it is not uncommon in primigravidae. In this study, 42 primigravidae and 98 parous women were noted.

In this study, 82 unbooked and 58 booked cases were noted.

[Table 2] shows that in this study, PPH was noted in 56 vaginal deliveries and 84 caesarean sections of which 51 were emergency LSCS and 33 were done electively.

**Table 1: Age wise incidence of PPH, correlation of parity with occurrence of PPH.**

Age (years)	Number	Percentage
<20	5	3.7
21-25	38	27.5
26-30	53	37.5
31-35	35	25
36-40	9	6.3
Parity	Number	Percentage
Primigravidae	42	30
Multiparous	98	70

**Table 2: Correlation of mode of delivery and PPH**

Mode of Delivery	Number	Percentage
Vaginal	56	40
Caesarean	84	60

**Table 3: Risk factors associated with atonic PPH**

Risk factor	Number	Percentage
Anemia	99	71.25
Multiparity (>2)	42	30
Preeclampsia	44	31.25
Placenta previa	7	5.1
Abruptio placentae	15	11.25
Prolonged labour	15	11.25
Precipitate labour	10	7.5
Multiple pregnancy	9	6.25

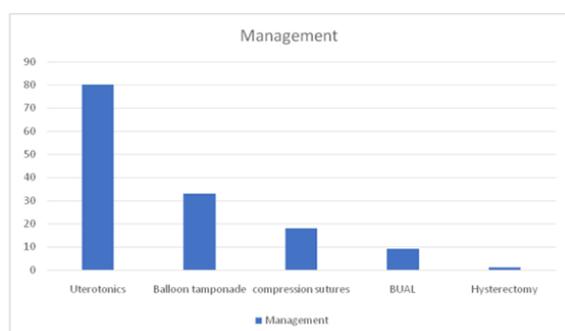
Big baby	10	7.5
Polyhydramnios	14	10
Obesity	16	11.25

**Table 4: Management of atonic PPH**

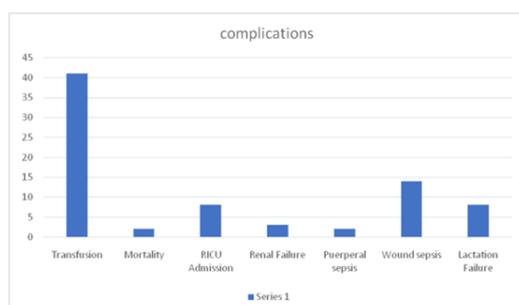
Management	Number	Percentage
Uterotonics+Uterine massage	80	57.14
Balloon Tamponade	33	23.57
Compression Sutures	18	12.85
Uterine artery ligation (BUAL)	9	6.42
Hysterectomy	1	0.71

**Table 5: Complications and outcome**

Complications	Number	Percentage
Transfusion	41	29.2
Mortality	2	1.4
RICU admission	8	5.75
Renal Failure	3	2.1
Puerperal Sepsis	2	1.42
Wound Sepsis	14	10.75
Lactation Failure	8	5.71



**Figure 1: Management of atonic PPH**



**Figure 2: Complications in PPH**

[Table 3] shows that there are a multitude of risk factors associated with atonic PPH. The most common risk factor for atonic PPH is anemia, followed by multiparity and preeclampsia. Other important risk factors are placenta previa, abruption, multiple pregnancy, polyhydramnios, prolonged labour, precipitate labour, big baby, induced labour, obesity, extremes of age.

[Table 4] shows that among the cases studied, 80 cases responded to uterotonics and uterine massage only, in 33 cases balloon tamponade was effective in controlling PPH, 18 cases needed compression sutures, in 9 cases uterine artery ligation was done and hysterectomy was done in 1 case.

[Table 5] shows that most of the cases were already anemic at the time of delivery, it worsened after PPH.

41 women required transfusion which accounts for 29.2%. 8 women required RICU support. There was mortality in 2 cases secondary to irreversible hypovolemic shock and renal failure. 3 cases had acute renal failure. Puerperal sepsis was noted in 2 case. Wound sepsis noted in 14 cases as these women were already malnourished and anemic. Lactation failure was noted in 8 cases.

## DISCUSSION

Postpartum hemorrhage is one of the most important and common complication of third stage of labour. It is one of the most leading cause of maternal mortality accounting for a quarter of maternal deaths worldwide. In developing countries, its incidence is higher, and causes 140,000 deaths annually and accounts for 60% of maternal deaths. PPH occurs in 4-5% of all deliveries. Uterine atony is the commonest cause accounting to around 80% of all cases. The place of delivery and severity of hemorrhage determines the outcome. If the woman has developed PPH following delivery in a facility, the immediate medical and surgical interventions are possible. It is not so, when woman delivers at home or in a small hospital illequipped with facilities to manage obstetric emergencies. Diagnosis of PPH and decision to transfer to a hospital or tertiary care centre is very crucial. Home deliveries or deliveries in a small facilities have a negative influence on outcome as critical time is lost in transfer of patient to higher centres. PPH occurs in 4-5% in all deliveries. Its incidence is around 2- 4% in vaginal deliveries and around 6% in caesarean deliveries. In this study, the incidence of PPH was found to be 2.14%. Uterine atonicity accounts for 81.37% of all cases of PPH i.e. 1.74% of all deliveries. In the study by Solwayo Ngwenya et al,<sup>[6]</sup> and Chandrika S. Kodla et al,<sup>[7]</sup> reported similar findings. Various authors, Sheikh et al,<sup>[8]</sup> Bateman et al,<sup>[9]</sup> and Lutomski et al,<sup>[10]</sup> estimated the incidence of PPH as 1-5% which is comparable to our study. Another study by

Rueangchainikhom et al.<sup>[11]</sup> the incidence of PPH was 1.98%. The study of Solwayo Ngwenya<sup>6</sup> and the study of Sam Ononge et al.<sup>[12]</sup> observed that the mean age of woman with PPH was 27.7+ 6.9yrs and 24.4+ 6 yrs respectively. In the study conducted by Sam Ononge et al,<sup>[12]</sup> it was observed that 17(20.7%) participants were < 20 yrs of age, 58(70.7%) participants were between 21-35 years of age, around 8% greater than 35yrs of age. In the present study, highest incidence was noted between age of 26-30 yrs (37.5%) followed by 21-25yrs (27.5%), in age group 31- 35yrs (25%), 36-40yrs (6.3%), < 20 yrs of age- 3.7%. Although risk is higher in both extremes of age i.e less than 20yrs and greater than 40yrs of age, incidence is low as majority of the deliveries occur in the age group of 21- 34 yrs. In the Zimbabwe study of Joupilla,<sup>[13]</sup> association of increased maternal age and atonic PPH was noted. Whereas no such association with increased maternal age was reported in Ashraf T,<sup>[14]</sup> and Adetoro studies.<sup>[15]</sup> In the present study, PPH was noted more in caesarean deliveries(84) than in vaginal deliveries(56) more in emergency caesarean than elective. In the present study, unbooked cases, most of which were referred from other centres were greater than unbooked cases. In the present study, anemia (71.25%), multiparity (30%), preeclampsia (31.25%), placenta previa (5.1%), abruption (11.25%), prolonged labour (11.25%), was noted. Similar findings were reported by Solwayo Ngwenya et al,<sup>[6]</sup> and Chandrika S. Kodla et al,<sup>[7]</sup> whereas no significant risk factor was identified in 18% of the cases. This study reported that majority of the patients had blood loss of less than 1500ml (78.2%) and 31.8% had blood loss greater than 1500ml. these results were comparable with that of study by Stones<sup>79</sup>. 29.25% of the patients needed blood transfusion. In this study, 57.14% cases were managed using only uterotonic [oxytocin, ergometrine, prostaglandins- prostadin and PGE1]. 23.57% required balloon tamponade, 12.85% needed compression sutures, 6.42% needed uterine artery ligation (BUAL) and 0.71% needed hysterectomy in addition to uterotonic. AMTSL was done in all the deliveries conducted in our hospital. In a study by Bibi et al,<sup>[16]</sup> 78% cases of atonic PPH were controlled with uterotonic. Manual removal was done in 8% cases, compression sutures were applied in 2.2% and hysterectomy was done 3.67% cases. Su LL et al,<sup>[17]</sup> study reported that 100 µg of intravenous carbetocin is more effective than oxytocin for preventing PPH in women undergoing caesarean deliveries. Carbetocin is associated with less blood loss compared to syntometrine in the prevention of PPH for women who have vaginal deliveries and is associated with significantly fewer adverse effects. B Lynch C et al,<sup>[18]</sup> study reported that the B-Lynch suturing technique (brace suture) may be very helpful because to its ease of use, potential for saving lives, general level of safety, and ability to preserve the uterus and hence fertility. It is possible to evaluate satisfactory hemostasis right away after application. Other more drastic surgical techniques, such as those

outlined in this work and the literature, can be considered if it fails, which has not yet been the case. The unique benefit of this cutting-edge method is that it offers an alternative to major surgical operations like hysterectomy or the regulation of pelvic arterial pulse pressure. This suturing method has been used effectively so far with no issues or obvious complications. A systematic review to evaluate success rates of treatment of major PPH by uterine balloon tamponade, uterine compression sutures and step wise devascularisation was done. At present there is no evidence to suggest that any method is superior for management of severe PPH. In case of failure of conservative medical and surgical treatment, hysterectomy must be performed, which can be lifesaving.

## CONCLUSION

The present study concluded that anaemia is the major risk factor contributing to PPH, followed by multiparity and preeclampsia. Early identification of risk factors and treatment of preventable ones like anaemia, implementation of prevention strategies should be mainstay of management. Universal adoption of AMTSL must be done to lower incidence of PPH. Estimation of blood loss must be done accurately along with careful assessment of clinical status of woman using shock index and urgency grid. Institutional deliveries will help prevent and manage this complication in an effective manner. Facility preparedness in all respects will prevent deaths due to atonic PPH. Wise prompt decisions regarding use of different modalities and their combinations will prevent morbidity and mortality. Technical expertise, confidence and surgical skills are essential to manage complicated cases. Anaesthesia, ICU backup and availability of blood and components improve outcome. Avoidance of delay in identification and transfer, identification of high risk cases and timely transfer and referral to higher centres.

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