

## Postpartum hemorrhage: An audit of one year at Tertiary Care Hospital

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### Abstract

**Background:** Postpartum hemorrhage (PPH) remains a leading cause of maternal mortality in developing countries.

**Objective:** To determine the maternal outcome by an audit of one year among the cases of primary postpartum hemorrhage at a tertiary care hospital.

**Methodology:** This cross-sectional study was conducted in the Department of Obstetrics and Gynecology, DHQ Teaching Rawalpindi from 1<sup>st</sup> January 2019 to 31<sup>st</sup> December 2019. A total of 9122 deliveries were conducted at the hospital. We reviewed the charts of all the patients who fulfilled our inclusion criteria and gathered data on a structured, pre-tested proformas prepared for the purpose.

**Results:** A total of 9122 maternities were reported during the study period with the frequency of PPH 70 (0.77%). Booking status, 25 (35.7%), high parity 18 (25.7%), and uterine atony in 54 (77%) out of 70 PPH patients, were associated with PPH. Medical management of PPH with uterotonic drugs was successful in 23 (30%) of patients. Uterine packing was done in 27 (38%) patients and bleeding was successfully arrested in 24 (90%) of these 27 patients. Hysterectomy was performed in 9 (12.8%) patients. Maternal death due to PPH was reported in 1 (1.4%) cases.

**Conclusion:** PPH is the leading cause of maternal mortality and morbidity, associated with booking status, parity, and uterine atony. Hospital management should emphasize the predefined protocol to be followed in managing a patient with postpartum hemorrhage.

**Keywords:** Postpartum hemorrhage, Uterine atony, Uterine packing

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### Introduction

Birth is a normal physiological process which the female body is designed to do, and it's part of the female natural reproductive life cycle.<sup>1</sup> In most situations, especially when there aren't any unnecessary interventions, vaginal birth is a perfectly safe, low-risk, and preferred method of giving birth. Pregnancy and birth, although natural processes aren't without risks.<sup>1</sup> A pregnancy that has progressed without any apparent hitch can still give way to complications during delivery.<sup>2</sup> Complications during pregnancy and childbirth are a leading cause of death and disability among women of reproductive age in developing countries.<sup>3</sup> All women who carry a pregnancy beyond 20 weeks' gestation are at risk for PPH and its sequel. Heavy bleeding after a baby is born (postpartum hemorrhage) is a complication of pregnancy that has the potential to be very serious, even resulting in death in rare cases. For women known to have risk factors for PPH, appropriate steps for

prevention should be incited during antenatal and intrapartum periods to reduce this risk. PPH can also occur with no risk factors.<sup>3,4</sup>

Although maternal mortality rates have declined greatly in the developed world, PPH remains a leading cause of maternal mortality elsewhere. In industrialized countries, PPH usually ranks in the top 3 causes of maternal mortality, along with embolism and hypertension. In the developing world, several countries have maternal mortality rates in excess of 1000 women per 100,000 live births, and World Health Organization statistics suggest that 60% of maternal deaths in developing countries are due to PPH, accounting for more than 100,000 maternal deaths per year.<sup>3</sup> PPH is defined as blood loss of more than 500 ml following a vaginal delivery or more than 1000 mL following cesarean delivery.<sup>4,5</sup> A loss of these amounts within 24 hours of delivery is termed early or primary PPH, whereas such losses are termed late or secondary PPH if they occur 24 hours after delivery. PPH occurs in 2% of all deliveries.<sup>6,7</sup> In developing countries most deaths resulting from

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PPH occur during the first 24 hours after birth mainly due to delay in seeking care, delay in reaching care, and delay in receiving care.<sup>8,9</sup>

It is essential that when heavy bleeding occurs, the birth attendants must act quickly as Ian Donald said “while managing PPH Time lapsed should not be counted in a minute---one has not lost one minute, but 60 seconds”, and use proven techniques to stop the bleeding and help the woman recover. Improving health care for women during childbirth in order to prevent and treat PPH is an essential step towards the achievement of the Millennium Development Goals.<sup>10</sup> This study was conducted to determine the maternal outcome by an audit of one year among the cases of primary postpartum hemorrhage at a tertiary care hospital.

## Methodology

This cross-sectional study was conducted in the Department of Obstetrics and Gynecology, DHQ Teaching, Rawalpindi from 1<sup>st</sup> January to 31<sup>st</sup> December 2019. All the booked, non-booked cases delivered at DHQ and presented with primary PPH were included in the study, for further data analysis, on causes, treatment, and outcome. We reviewed a total of 9122 charts of all the patients who fulfilled our inclusion criteria and gathered data on a structured, pre-tested proforma prepared for the purpose. Those having incomplete records were excluded. In our study primary PPH was defined as the loss of 500 ml or more of blood from the genital tract within 24 hours of the birth of a baby. PPH was labeled as minor (500-1000 ml) or major (more than 1000 ml). Major PPH was divided into moderate (1000-2000 ml) or severe (more than 2000 ml). Women with pre-existing bleeding disorders and women taking therapeutic anticoagulants were excluded. Estimation of blood loss: Blood loss estimation was made by subjective as well as objective assessment. Subjective measures included counting of swabs, estimation of blood clots, and blood in the suction bottle. Objective assessment was made by estimation of Hb levels, need for blood transfusions, clinical condition of the patient, and degree of shock. Active management of the third stage of labor was offered to all women delivering at our institution.

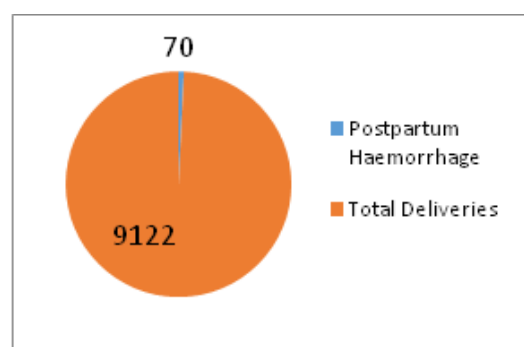
Information regarding booking status, mode of delivery, possible risk factors, causes of PPH, the therapeutic medical and surgical interventions,

and outcomes of the management was collected. The data obtained from the file review were coded and entered in SPSS version 16.0 for analysis. Descriptive statistics have been presented for a consecutive series of patients with primary PPH. Ethical approval from the Ethical Committee of the Institute was sought.

## Results

A total of 9122 maternities were reported in the Hospital, within the study period. The prevalence of PPH at the tertiary level for the study period was 70 (0.77%) out of 9122 deliveries. (Figure-I)

**Figure-I: Postpartum Haemorrhage among Total Deliveries at a Tertiary Care Hospital**



In this study, case notes of women who delivered in the hospitals were further explored to identify the women with primary PPH and 70 women were identified. Therefore, the result of this study focused on the 70 cases of women with primary PPH during one year of the study period. For most of the PPH cases in the tertiary institution, the women were mostly non-booked or referred from primary health care centers and private hospitals i.e 45 (64.3%) patients. From the information in the case notes referrals were made when patients had obstructed labor, the prolonged first or second stage of labor, and fetal distress due to meconium staining of liquor. Only 25 (35.7%) women had antenatal care at our institution (booked cases). The age range of the women was between 22 and 42 with a mean age of 29±6 years.

A chi-square test reflected a significant association between booking status 25 (35.7%) and occurrence of PPH ( $\chi^2 = 5.714$ ,  $df = 1$ ,  $p=0.017$ ). The leading associated risk factors for primary PPH were high parity 18 (25.7%), and anemia 11 (15.7%) followed by birth weight >4 with or without polyhydramnios 9 (12.8%), and multiple pregnancies 8 (11.4%). Others

include antepartum haemorrhage 7 (10%), previous history of PPH, 5 (7.1%), preeclampsia 6 (8.5%), chorioamnionitis 4 (5.7%), and abnormal lie/presentation 3 (4.2%). In addition, uterine atony was the most common etiological factor 54 (77.1%) for primary PPH followed by the retained placenta and retained placental tissue in 7 (10%) patients. Other etiologies included cervical/vaginal tears in 3 (4.2%) patients, abnormally adherent / low lying placentas in 5 (7.1%) patients' and 1 (1.4%) patient with uterine rupture.

All the patients having PPH, 70 (100%) had active management of the third stage of labor. All the cases of primary PPH diagnosed during the study period received additional administration of 10 IU intravenous uterotonic (oxytocin), 1 gram intravenous Tranexamic acid, and 800mg misoprostol per rectal. Bleeding was arrested without complications in 21 (30%) with medical management. In our tertiary care center, EUA and uterine packing were done in 27 (38.5%) patients and bleeding was successfully arrested in 90% of patients.

B-lynch was applied in 6 patients, who went into PPH during cesarean section. Bleeding was successfully arrested in 4 (66%) patients. Internal iliac ligation was done in 1 patient where uterine packing failed and was unsuccessful. Hysterectomy was performed in 9 (12.8%) patients, 3 patients had morbidly adherent placenta, 2 cases failed uterine packing, 1 case of uterine rupture, and 3 cases where B-lynch and internal iliac ligation failed. Evacuation of the placenta and placental remains was done in 7 (10%) cases. However, repair of tear/laceration was only documented in 3 (4.2%) cases. Maternal death due to PPH was reported in 1 (1.4%) case.

## Discussion

PPH, a leading cause of maternal mortality, causes an estimated 140,000 deaths each year globally - this roughly corresponds to one woman dying every 4 minutes. In addition, serious morbidity may follow PPH in the form of various sequels.<sup>11,12</sup> Massive PPH is associated with a worse prognosis. Inability to stabilize a patient who is in hemorrhagic shock can eventually result in death.<sup>11</sup> The incidence of PPH in this audit was 0.77% of all deliveries in 2019 at DHQ Hospital Rawalpindi, Pakistan. This figure is certainly

comparable to that reported in studies conducted at AKUH, Karachi which was 0.64%.<sup>11</sup> However other population-based studies where the incidence of massive PPH has been reported to be as high as 1.1%.<sup>13,14</sup> The prevalence of postpartum hemorrhage (PPH) (blood loss  $\geq 500$  ml) ranged from 7.2% in Oceania to 25.7% in Africa. The prevalence of severe PPH (blood loss  $\geq 1000$  ml) was highest in Africa at 5.1% and the lowest in Asia at 1.9%.<sup>12</sup> In a recent review, PPH was also found to have an increasing trend in the more developed parts of the world.<sup>15</sup> The exact reasons for this rise remain unclear.

In the current study increased incidence of PPH was recorded among non booked patients. The larger percentage of non booked women who had PPH in this study confirmed the importance of quality antenatal care in early recognition of risk and control of complications associated with pregnancy. The age range of presentation at our institution was 22–42 years. Incidence of PPH was reported in similar age group in other studies.<sup>15,16</sup>

Multiparas showed an increased incidence of PPH in our study. A study was done in Nigeria by A.E.Olowokere also had more incidences in multiparas.<sup>13</sup> Whereas in studies conducted by Lill Trine et al and Michael Kramer showed increased incidence in primiparas.<sup>14,15</sup> The NICE guideline on intrapartum care identified eight cross-sectional studies assessing parity as a risk factor for PPH and recommended that grand multiparas (parity 4 or more) should be advised to give birth in an obstetric unit where more emergency treatment options are available.<sup>16</sup> The majority of patients had spontaneous labor followed by augmentation of labor and delivery by cesarean section. Similar results were presented in studies by A.E.Olowokere and Lill Trine et al,<sup>13,14</sup> whereas others showed increased risk with cesarean section and augmentation of labor.<sup>15</sup> A study conducted in Uganda c-section was a risk factor for PPH.<sup>17</sup> Major risk factors identified were high parity, anemia, macrosomia with or without polyhydramnios and antepartum hemorrhage followed by preeclampsia, chorioamnionitis, and malpresentation. Anemia remained a major risk factor in many of the studies followed by the history of PPH in a previous pregnancy, preeclampsia, and increased fetal weight.<sup>18-20</sup>

Although active management of the third stage of labor and use of uterotonic drugs helps contract the uterus and hence decreased postpartum blood loss due to relaxed uterine muscles<sup>21</sup> still Uterine atony



remained major etiology in our setup causing PPH in 77% of cases followed by RPOC's and tears as other main etiologies. Uterine atony remained the major etiology in many reviewed studies. In an Irish study, atony accounted for 76% of the total cases of PPH.<sup>22</sup> Incidence of uterine atony was high in the study conducted at AKUH i.e (96%).<sup>11</sup> Medical management of PPH with uterotonic drugs was successful in 30% of patients and these patients did not need any mechanical or surgical treatment. Many international articles support the use of tranexamic acid and misoprostol along with oxytocin in the treatment of PPH with significant decreases in rates of acute cases of PPH and mean blood loss.<sup>23-25</sup> Uterine packing was done in 30 (43%) patients and bleeding was successfully arrested in 27 (90%) patients. Similar results were shown in a study conducted in 2008 by Khairunnisa where uterovaginal packing was successful in 89.14% of patients.<sup>26</sup> Also in studies done by Ge J and GUO YN success rate was 92% and 90.9 % respectively.<sup>27,28</sup> Thus uterine packing with an abdominal sponge or gynaec gauze has proved to be an effective method for preventing PPH. B- Lynch was applied in 8 patients and bleeding was arrested in 6/8 (75%) patients. In a study conducted in Singapore, the b-lynch suture was successful in 71% of patients.<sup>29</sup> Whereas a study conducted in Mumbai India by Nidhi kalkal showed that the procedure was successful in 100% of the cases.<sup>30</sup> Internal iliac ligation was done in 1 (1.4%) patients which were not successful in our setup. VM Joshi in 2007 in India demonstrated that internal iliac artery ligation for arresting postpartum hemorrhage was successful in only 39% of cases.<sup>31</sup> Timely recognition and intervention are fundamental in preventing serious maternal morbidity and mortality from massive PPH. A combination of conservative therapies is adequate and successful in most cases. However, when the hemorrhagic process continues and when either clotting abnormalities or hemodynamic instability develop, the next step must be an invasive intervention.<sup>32,33</sup>

## Conclusion

Postpartum hemorrhage is the leading cause of maternal mortality and morbidity, associated with booking status, parity, and uterine atony. Identifying high-risk factors and active

management of the third stage of labor is key to the prevention of PPH. It is very important to assess postpartum blood loss, identify the etiology, and strict adherence to predefined protocol in order to reduce maternal morbidity and mortality that can result from postpartum hemorrhage. A serious postpartum hemorrhage requires teamwork and there are many things to be done at the same time by a limited number of people, hence hospital management should emphasize the predefined protocol to be followed in managing a patient with postpartum hemorrhage so that every patient is managed appropriately without any delay of time.

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