Original Article

Primary Postpartum Hemorrhage, Still a Big Challenge in Developing World (Experience in Tertiary care Hospitals, KSA versus Pakistan)

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Abstract

Background: Postpartum Hemorrhage (PPH) is still the leading cause of maternal mortality and morbidity in developing world inspite of major developments in its prevention and management in 21st century. While working in KSA, author observed a comparatively low frequency of postpartum hemorrhage in Kingdom of Saudi Arabia (KSA) as compared to her past experience in Pakistan where this figure is still very high. This observation led to conduct this study to find out the reasons for this difference.

Objectives: The objective of this study is to find out

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the differences in frequency, risk factors and management options especially cesarean hysterectomy for PPH between KSA and Pakistan.

Study Design: Observational study.

Place and Duration of Study: One year study (2007) conducted in tertiary care hospitals i.e. Maternity and Children Hospital Buraida (MCH), KSA and Services Hospital Gyne. Unit II, Lahore (SHL) Pakistan.

Methods: The sample included all patients who suffered from PPH over study period in both hospitals. The Sample was divided into two groups; Group A included 105 cases of primary PPH out of 8757 deliveries in MCH Buraida.KSA and Group B included 150 cases of primary PPH out of 2064 deliveries in SHL Gyne Unit 2 Pakistan. Data were collected on a structured proforma regarding risk factors, causes and management options of PPH and compared between the two groups.

Analysis of Data: Data was analyzed using computer programme SPSS Version 13 for windows and a p-value of < 0.05 taken as statistically significant.

Results: Significant difference was found in frequency of primary PPH (1.19% vesus 7.2% ;p-value < 0.05) and risk factors for PPH; anemia (10% versus 78%; p-value- < 0.05), prolonged labor (0% versus 9%), obstructed labor (0% versus 6%), grand multiparity (28% versus60%) ,injudicious use of oxytocin (0.95% versus 5.3%) and emergency C-section (20% versus 77%; p-value < 0.05), low socioeconomic class, transport problems, and frequency of unbooked cases between Group A and B respectively. Comparatively high frequency of cesarean hysterectomy noted in Pakistan as compared to KSA (3.39/1000 versus 0.45/ 1000 deliveries) respectively.

Conclusion: The findings suggest that PPH figures in KSA correspond to those of developed world, and of Pakistan resemble to those seen in developing world, but much better than some African countries. It is concluded that PPH is still a big challenge in developing countries. The reason for this difference is poor socioeconomic status, high prevalence of anemia, home deliveries, inadequate transport services and lack of obstetric services at primary health care level.

Key Points: Postpartum hemorrhage (PPH), frequency, risk factors, management options, cesarean hysterectomy, Pakistan, KSA.

Introduction

Postpartum hemorrhage (PPH) is the leading cause of death in developing countries, accounting for 25% of maternal deaths.[1] It complicates 6% of deliveries.[1,2] Even with appropriate management, upto 3% of vaginal deliveries result in severe postpartum hemorrhage.[3, 4]

Postpartum hemorrhage is blood loss in excess of 500 ml in vaginal birth and > 1000 ml in cesarean section (WHO).[5] Another definition is a pre and post delivery hematocrit difference of >10%.[3] Postpartum hemorrhage during first 24 hours after delivery is called primary and secondary if it occurs 24 hours up to 6 weeks after delivery. Important causes of PPH include uterine atony (70%), genital tract trauma (20%), retained placenta (8 – 10%) coagulation disorders and uterine inversion (1 – 2%).[5] The risk factors for PPH include anemia, grand multiparity, over distension of uterus (polyhydramnios, multiple pregnancies), ante partum hemorrhage, injudicious use of oxytocin, prolonged difficult labor, genital tract infections & instrumental deliveries.[6]

The background causes of PPH in under developing world are low socioeconomic status, poor transport services, inadequate obstetric services with great prevalence of anemia and mismanaged labor by poorly trained lady health visitors at home. In case PPH occurs at home, mothers either die at home or on the way to hospital as a result of poor transport services. They may reach hospital in a state of irreversible shock leading to death or may survive with residual morbidity like chronic anemia, Sheehan's Syndrome, renal failure and Adult Respiratory Syndrome.[6,7]

The implementation of new changes in prevention and treatment of PPH is an essential part of a wider commitment towards saving mothers from complications of childbirth.[6,7]

Developed countries like United Kingdom, after conducting confidential inquiries into maternal deaths have identified the avoidable risk factors for PPH. In these countries, protocols have been developed to manage PPH. But such strategies are still not well applied in under developing countries.[8] Evidence based, low cost and feasible interventions are available to prevent and manage PPH and improve maternal survival.[9,10] The best preventive strategy is active management of 3rd stage of labor (AMTSL).[10]

While working in KSA, it is noted that frequency of PPH and emergency hysterectomy done for PPH is quite low here as compared to Pakistan. So a comparative study is conducted to compare the frequency of PPH, its risk factors and management options between Pakistani and Saudi ladies.

Materials and Methods

The study was conducted over one year (2007). The sample was divided into two groups; Group A included 105 cases of PPH out of 8757 patients delivered in MCH Buraida, KSA while Group B included 150 patients who suffered PPH out of a total of 2064 deliveries in SHL, Gyne Unit 2, Pakistan.

Inclusion Criteria

All patients who suffered from primary PPH:

1. Both delivered by vaginal route and by cesarean section.
2. All cases irrespective of any cause.
3. All grades from mild to moderate and severe PPH.

Exclusion Criteria

All patients with secondary PPH.

Outcome Measures

1. Frequency of primary PPH.
2. Background Risk factors and Causes of primary PPH.
3. Management options used.
4. Frequency of cesarean hysterectomy.
5. Maternal mortality and morbidity.

Data were collected from hospital registers (MCH, KSA) and collected by the on duty registrars (SHL, Pakistan) and recorded on a structured Performa regarding risk factors for PPH and management strategies applied in each case. All patients were evaluated by history, physical examination and baseline investigations including blood coagulation profile, hemoglobin and hematocrit before and 48 hours after delivery.

Social class was classified into rich, middle and poor class according to the husband profession and living standards.

Frequency of anemia in both groups was calculated by defining anemia in pregnancy according to WHO criteria i.e. < 11 gm/dl.

PPH is defined as blood loss in excess of 500 ml in vaginal delivery and > 1000 ml in cesarean section (WHO). Other criteria to define PPH are blood loss severe enough to bring hemodynamic instability of the patient and hematocrit difference of > 10% between pre and post delivery. Blood loss after delivery was estimated by special drapes put under the parturient and removed after 1 hour of delivery and blood collected in graduated plastic bags depending upon severity PPH is divided into two groups.

1. **Mild to Moderate:** Blood loss between 500 – 1000 ml (vaginal delivery), mild hemodynamic instability, majority of the patient managed successfully with simple measures like oxytocic drugs, stitching a tear, vaginal packing, or may need 1 to 2 packs of blood transfusion especially if previously anemic.
2. **Severe PPH:** Blood loss. > 1000 ml, patient clinically unstable, and needed multiple blood transfusions and rapidly ends up in shock if not timely resuscitated and treated.

Maternal mortality data was collected from especially maintained maternal mortality registers. Difficulties encountered in obtaining consent for cesarean hysterectomy as a life saving procedure were also noted.

Data were compared between the two groups. Results were analyzed using SPSS Version 13 of computer applying student t test and p-value for statistical significance.

Results

Table 1 shows Obstetric data in KSA (MCH–Buraida) and in Pakistan (SHL) during year 2007.

Significant difference is found in frequency of cesarean section (25% versus 37.5%), emergency C-section (20% versus 77%; p-value < 0.05) and forceps delivery (4% versus 31.4%) between Group A and B respectively.

There is no significant difference in age (30 versus 28) and parity (PG; 20% versus 25%, G2-5; 42% versus 35% and grand multipara; 38%versus 40%) between two groups.

There is significant difference in frequency of PPH; 1.19% versus 7.2% (p-value < 0.05) in Group A. and B respectively as shown in Table 2.

Table 3 shows that uterine atony remained the leading cause of primary PPH in both groups (70% versus 80%), followed by genital tract trauma (10% versus 12%), retained placenta (15% versus 5%) in Group A and B respectively while DIC and uterine inversion remained 1 – 2% (both) in both groups.

From table 4 it is evident that there is statistically significant difference in risk factors for PPH; grand multiparity (28% versus 40%), prolonged labor (none versus 9%), obstructed labor (none versus 4%), in judicious use of syntocin one (0.95% versus 5.3%) and

Table 1: Obstetric data in KSA (MCH – Buraida – 2007) and in Pakistan (SHL – 2007).

Parameters	KSA (Group – A)	PAKISTAN (Group – B)	P-value
• Total no. of deliveries.	8757	2064	
• Total no of C-Section	2193 (25.05%) Elective – 1754 (80%) Emergency – 439 (20%)	774 (37.5 %) Elective – 174 (23%) Emergency – 600 (77%)	< 0.05
• Total no of vaginal deliveries	6564 (74.95%)	1290 (62.5%)	
• Total no. of instrumental deliveries.	201 (3%)	150 (11.6%)	< 0.05
A) – forceps del.	7 (4%)	47 (31.4%)	< 0.05
B) – vacuum extraction	194 (96%)	103 (68.6%)	< 0.05

Table 2: Frequency of PPH in group A and B.

Variable	Group – A	Group – B	P-Value
Total no. of cases of PPH.	105 (1.19%)	150 (7.2%)	< 0.05
a) – Mild to moderate PPH	95 (90.47%)	115 (76.6%)	< 0.05
b) – Severe PPH	10 (9.53%)	35 (23.4%)	< 0.05

Table 3: Causes of Primary PPH

Variables	Group A	Group B	p-value
Uterine atony	73 (70%)	120 (80%)	< 0.05
Genital tract trauma	10 (10%)	19 (12%)	> 0.05
Retained Placenta	15 (15%)	7 (05%)	> 0.05
DIC	1 (1-2%)	2 (1.5%)	> 0.05
Uterine inversion	2 (2%)	2 (1.5%)	> 0.05

Table 4: Risk factors for PPH.

Variables	Group – A (105)	Group – B (150)	P-value
1. Grandmultiparity	30 (28%)	60 (40%)	< 0.05
2. Prolonged labor	None (0%)	4 (9%)	< 0.05
3. Obstructed labor.	None (0%)	6 (4%)	> 0.05
4. Injudicious use of oxytocin	1 (0.95%)	8 (5.3%)	> 0.08
5. APH a) Placenta previa b) Abruptio placenta	2 (1.9) 1 1	2 (1.3) 2	> 0.05
6. Placenta accrete	2 (1.9%)	3 (2%)	> 0.05
7. Twin pregnancy	6 (5.7%)	5 (3.3%)	> 0.05
8. Polyhydramnios	3 (2.8%)	4 (2.6%)	> 0.05

Variables	Group – A (105)	Group – B (150)	P-value
9. Prolonged rupture of membranes	1 (0.95%)	8 (5.3%)	< 0.05
Home delivery	None	75 (50%)	
Anemia	10 (9.5%)		< 0.05
Living Standards		117 (78%)	
1. Poor class	2%	70%	
2. Middle class	80%	28%	< 0.05
3. Upper class	18%	2%	
Others;			
1. Antenatal care	95% booked	32% booked	< 0.05
2. Transport problems	2%	65% have transport problems	
3. Difficulty in getting consent for cesarean Hysterectomy	Yes (3cases).committee arranged from 3 consultant	Yes (1 case)	< 0.05

Table 5: Frequency and indications of Cesarean hysterectomy in both groups.

Variables	Group – A	Group – B	P-Value
No. of Cesarean hysterectomies	4 (0.45/1000 deliveries)	7 (3.39/1000 deliveries)	< 0.05
No. of Cesarean hysterectomies			
Uterine atony	2	5	
Placenta previa accrete	1		
Ruptured uterus	1	2	

Table 6: Maternal mortality and morbidity in both groups in PPH.

Variables	Group – A	Group – B	P-value
Maternal mortality	None	1 (45/100.000)	> 0.05
Maternal morbidity			
1. Renal failure	None	2 (1.3%)	
2. DIC	None	2 (1.3%)	
3. Anemia	2 (1.9%)	87 (58%)	

prolonged rupture of membranes (0.95% versus 5.3%) between the Group A and B respectively.

All cases of PPH received medical treatment (oxytocin), bimanual massage done in cases with uterine atony along with 3 tablets of misoprostol used per rectum Conservative surgery done in both groups included uterine artery ligation (2 versus 4 cases), internal iliac artery ligation (4 versus nil), B-Lynch Brace Suture (2 versus none), uterine artery embolization (1 versus none) in Group A & B respectively.

Cesarean Hysterectomy was done (4 versus 7 cases; 0.45/1000 versus 3.39/1000) in Group A and Group B respectively as a life saving procedure when conservative medical and surgical measures failed.

There was no maternal death in Group A, and one maternal death in Group B. This was a case of grand multipara with home delivery & reached hospital in a state of irreversible shock, DIC and renal failure. There is a significant difference in maternal complications due to PPH between the two groups; renal failure (none versus 1.9%), DIC (none versus 1.9%) and postpartum anemia (1.9% versus 58%) in 6 weeks follow up visit between Group A and B respectively.

Discussion

The results of this study show picture of two different worlds; the figures in KSA resemble to those of developed world and other oil producing Gulf States as shown by similar studies conducted in KSA[11] and that of Pakistan to the developing world, but better than some African countries.[12]

The frequency of primary PPH in our study is 1 – 2% in Group. A and 7 – 8% in Group B. Which coincides with frequency mentioned in developed and developing world in many studie.[11,12] The incidence of PPH ranges between 5% and 8% in places where some form of prophylaxis is practiced, but may be as high as 18% when a physiological approach is the norm.[13]

There is significant difference in prevalence of background risk factors &causes of PPH between two countries. Out of 150 patients who suffered PPH in Pakistan, 50% were delivered outside hospital (80% at home by traditional birth attendants and rest 20% in private hospitals by nurses) as compared to KSA where there is no record of home delivery and 10% patients were brought from private hospital after delivery with PPH. High frequency of anemia is noted in Pakistan as compared to Saudi community; 78% versus 9.5% (p-value < 0.05) in pregnancy respectively. Also poor class noted in 70% versus 2% (p-value < 0.05), transport problems 65% versus 1 – 2% (p-value < 0.05) and frequency of booked cases was 31% versus 95% (p-value < 0.05) in Pakistan and KSA respectively. These results coincide with results of other studies mentioned in literature.[14-17]

Uterine atony remained the leading (80%) cause of primary PPH in Pakistan with prolonged difficult labor, obstructed labor, injudicious use of oxytocin, prolonged rupture of membranes with chorioamnionitis and grandmultiparity remained major risk factors for uterine atony. These results are similar to results of a study in Indonesia.[18].

In KSA main risk factors noted were uterine atony with placenta previa and placenta.

Accrete responsible for severe PPH. Surprisingly grand multiparity is more common in KSA as compared to Pakistan (45% versus 20% in the overall sample delivered) but frequency of PPH was not significantly (28% versus 40%) raised in this group in KSA, a fact which shows that keeping other factors normal, grandmultiparity itself is not a risk factor for severe PPH. One study conducted in New York concludes that grand multiparity of itself in a healthy, economically stable population with modern medical care is not a major risk factor and that previous reports primarily reflected social class factors and not parity per se.[19] One study conducted in KSA concludes that with few exceptions the grandmultipara can be safely delivered by means of modern obstetric managent.[20] These results are different from some other studies in KSA which showed grandmultiparity as an important risk factor for primary PPH.in KSA.[11]

Frequency of outlet forceps delivery remained high in Pakistan (47%) as compared to KSA (7%) correlating with genital tract injuries as the second (12%) leading cause of Primary PPH with cervical tears noted in 40%, vaginal tears in 30%, 1st & 2nd degree perineal tears in 20% and mixed cervical and vaginal tears in 10% cases out of all forceps delivery in Pakistan. Ventouse is the instrument of 1st choice (RCOG) due to its low risk of maternal trauma. Vacuum preferably must be used in 2nd stage of labor to reduce frequency of genital tract trauma and resultant PPH.[16,17]

Retained placenta was recorded in 15% versus 5% cases respectively in Group A and B. In KSA, out of 15.2 cases were related to adherent placenta due to previous 2 scars; one was removed successfully under general anesthesia while 2nd case ended up in cesarean hysterectomy for placenta accrete with severe life threatening PPH. In Pakistan, out of 05 cases, 03 cases were delivered at home and received in hospital with retained placenta with cord hanging out of vulva. All cases were infected and managed with manual removal of placenta under G.A, blood transfusion and antibiotics.

DIC (diagnosed by low s/fibrinogen and platelets and raised fibrin degradation products and ruling out all other causes of PPH) as a cause of PPH was recorded in 1 – 2% of cases in both groups. They were managed by infusion of fresh frozen plasma. In Pakistan, one case of grandmultipara with abruption placenta presented with DIC at the time of admission with hematuria, ending up in severe PPH treated by fresh frozen plasma. These figures correspond to other studies results with DIC as a cause of PPH in 1 – 2% of cases.[16,17]

All cases delivered in hospitals in both groups were managed by active management of third stage of labor i.e.inj oxytocin 10 U.I/V at the time of delivery of anterior shoulder or crowning of head, controlled cord traction and uterine massage. The cases delivered outside hospital in Pakistan had no reliable record. The joint statement by the International Federation of Gynecologists and Obstetricians and the International Confederation of Midwives states that active manage-

ment of the third stage should be offered to all women as it reduces the incidence of postpartum hemorrhage due to uterine atony by 60%.[9, 13, 21]

All patients with severe PPH were resuscitated first followed by definite treatment in both groups. Inadequate and delayed resuscitation is an important cause of maternal death due to PPH. Karpati et al[22] in northern France showed that if patients were inadequately resuscitated over a period of time following major postpartum hemorrhage, up to 50% suffered significant myocardial damage.

Other conservative measures used in both cases both medical and surgical include, rectal misoprostol, ligation of uterine, and internal iliac arteries in both setups. In Group A, B Lynch Brace Suture was applied in 2 cases with successful outcome, and one case of primigravida with placenta accrete was transferred to Riyadh for uterine artery embolization which was also successful.

The frequency of cesarean hysterectomy remained relatively high in Pakistan as compared to that in KSA (3.39/1000 versus 0.45/1000). In modern obstetrics the overall incidence of peri-partum hysterectomy is 0.05%,[23] but there is a considerable difference in its incidence in different parts of the world depending upon modern obstetrical services, standard and awareness of antenatal car. In Nigeria, the incidence is 1 in 3492[24] and 1.3 / 1000 births in South California.[25,26]

There was one maternal death in Pakistan (45/ 100.000) versus no maternal mortality in KSA. This case which was delivered at home reached very late in hospital with irreversible shock, renal failure and DIC. However, deaths due to PPH is reported to represent between 17% and 40% of maternal mortality in some parts of the world.[5] One study reported maternal mortality due to PPH in KSA is 18/100,000 births[11] and reaching up to 500 / 100,000 births in some of African countries.[27- 30]

Difficulty was encountered in KSA in getting consent for cesarean hysterectomy in 3 cases even when it has to be performed as a life saving procedure. So a committee of three consultants was formulated to solve this issue. In Pakistan, it was difficult to get consent for hysterectomy in one case, but with appropriate counseling of husband and family, the issue was solved.

Results of this study show that from prevention to resuscitation and definite management to treatment of complication, PPH is still a big challenge in developing countries that needs multistep approach; from primary to secondary and tertiary level, adhering to protocols and guidelines, and conducting audits, to fight this biggest killer of mothers.

Conclusion

Frequency of PPH and PPH related maternal mortality and morbidity in KSA corresponds to that of developped world while that of Pakistan is similar to that seen in developing countries. Proper antenatal care, active management of 3rd stage of labor, delivery in a well equipped hospital and aggressive protocol of management of postpartum hemorrhage are the main differences between KSA and Pakistan.

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