

Post partum hemorrhage and its predisposing factors In WHO Multi-Country Survey on Maternal and Newborn Health, Pakistan

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Abstract

Objective: To determine the incidence and predisposing factors for Postpartum hemorrhage (PPH) among Pakistani women delivering in 16 referral facilities included in World health organization (WHO) Multicountry survey (MCS) on maternal and new born health (MNH), 2011.

Methodology: This cross-sectional study was conducted in 16 referral level health care facilities across Pakistan, from 1st March to 30th May, 2011 to evaluate the incidence and management strategies linked to maternal and neonatal mortalities. Data were collected from the hospital records of all women delivering in the studied facilities or admitted within 7 days of delivery or abortion with near miss maternal mortality. The data was entered and analyzed on SPSS. This study is a sub analysis of 217 women with PPH among the total population of 13175 delivered women. The incidence and predisposing factors of women with PPH were compared to the rest of the study population.

Results: Out of a total of 13175 women included in the study 217 (1.6%) suffered from PPH. The average maternal age was similar in both groups. Of the total 217 women with PPH, 32.0% women with PPH delivered preterm compared to 11% in the non PPH group. Cesarean delivery (51% vs 34%) and previous cesarean section 34% vs 19% were significantly associated with PPH. Similarly, general anesthesia 28.4% vs 3.1% for regional analgesia and antibiotics use 40.5% vs 21.7% were associated with PPH. Illiteracy was associated with PPH 41% vs 31% (p 0.001). There were 18 (8.3%) maternal deaths contributing to 47.3% of overall deaths in the study.

Conclusion: PPH is still responsible for an unacceptably large proportion of maternal mortality in Pakistan. Improved literacy rates, good nutrition, iron supplementation during antenatal visits and availability of better health facilities at the door step can reduce severe morbidity and maternal deaths from PPH.

Keywords: PPH, risk factors.

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Introduction

Empress Mumtaz, the wife of Emperor Shah Jahan of India bore 14 children and died after her last childbirth in 1630 of PPH. Shah Jahan built the world's most

beautiful tomb in her memory, the Taj mahal.¹ The health situation of parturient women in South Asia however remained unchanged despite the high cost of

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the monument which may have been better utilized to improve obstetric care for the women of the Indian subcontinent. Global maternal mortality in 2013 was 210/100,000 live births.² The most common cause of maternal mortality was PPH and accounted for one quarter of the maternal deaths.³

Postpartum hemorrhage has been defined as any blood loss from the genital tract during vaginal delivery above 500ml⁴ and 1000ml⁵ for Cesarean deliveries. Bleeding within 24hrs of vaginal delivery is termed primary PPH, whereas bleeding occurring afterwards but within 12 weeks of delivery is defined as secondary haemorrhage.⁶ Causes of Primary PPH are best described by the mnemonic 4T's (tone, tissue, trauma, thrombin) with uterine atony, the most common cause noted in 70% of cases.⁷ In Pakistan Demographic and Health Survey (PDHS) 2007, PPH contributed 27.2% to maternal mortality in Pakistan⁸ while in the latest PDHS 2012-2013, maternal mortality figures are not described.⁹

The WHO conducted a multicountry survey in 2011 to assess, maternal and neonatal mortality in referral level facilities across the world in 26 countries including Pakistan¹⁰ the results of which were published in 2013 in LANCET. This sub analysis was undertaken to assess the incidence and predisposing factors for PPH noted in 217 of the 13175 studied Pakistani women included in WHO MCS as PPH remains the commonest cause of maternal mortality in Pakistan

Methodology

Sixteen referral level government health care facilities from the federal capital, Islamabad and provinces of Sind and Punjab, participated in the cross sectional WHO MCS on maternal & newborn health. These facilities included Pakistan institute of Medical Sciences (PIMS), Federal Government Services Hospital (FGSH) from Islamabad. From Punjab seven Hospital including RMC hospitals, Benazir Bhutto Hospital (BBH), Holy Family Hospital (HFH), Shiekh Zayed Hospital Lahore, Services Hospital Lahore, Nishtar Hospital Multan, Bahawalpur Victoria Hospital, Muridke Hospital, DHQ Toba Tek Singh. From Sind province, Civil Hospital Karachi, Korangi Hospital Karachi, Qatar Hospital Karachi, Sobhraj Maternity hospital Karachi, And secondary facilities in Rohri, Badin and civil hospital Jacobabad. The study was started after taking approval from WHO ethical committee in Geneva than by national bioethics committee PMRC Pakistan. The duration of the study was from 1st March to 30th May, 2011. Inclusion criteria for facility selection were $\geq 1,000$

deliveries annually and the capacity to perform a caesarean section. Multistage cluster sampling strategy was used to select seven facilities from the provinces of Sind and Punjab while the two large government referral level facilities were selected from Islamabad. All women giving birth at participating facilities and those admitted within seven days postpartum or post abortion with near miss maternal mortality were included. Trained personnel collected data daily from hospital records at the time of discharge, transfer or death. Data was dispatched to the central collaborating office at MCH Centre, PIMS, Islamabad for web-based entry. Data analysis was done on SPSS 18.

For sub analysis of the WHO, MCS in Pakistan, among the 13175 women 217 suffering from PPH were selected. The studied characteristics compared among the PPH and non PPH groups were maternal demographics including age, education, gestational age, gravidity, parity, number of previous cesarean sections. The mode of delivery, delivery or abortion before arrival in a health facility, use of uterotonics for prevention of PPH, use of prophylactic antibiotics, administration of general anesthesia vs spinal anesthesia and maternal vital status at discharge were studied.

Results

There were total 13,156 deliveries among which 13,122 women delivered in the participating facilities. The rest of women 34 (0.25%) were referred. Vaginal deliveries were 8,570 and 4,552 (34.65%) were cesarean sections. Two hundred and seventeen (1.6%) women had PPH. Out of which 204 (94%) women delivered within the selected health facilities while only 13 (6%) women delivered before arrival in the hospital. There were 18 maternal deaths due to PPH contributing to 47.3% in overall deaths that occurred in the survey.

Out of 16 women who delivered before arrival in the health facility, 13 reported PPH while 3 presented with other conditions ($P < 0.001$). Illiteracy and Less than 5 yrs education were significantly associated with PPH ($P < 0.001$) as shown in table I. On the other hand, maternal education beyond primary school reduced the risk of PPH, 52% vs 38.7%. Preterm delivery was also significantly associated with PPH, 32% vs 11% ($p < 0.001$). Multigravidas were at a higher risk of PPH compared to primigravidae, 76.5% vs 68.3% ($p < 0.001$). Previous cesarean delivery was also significantly associated with PPH 34.6% vs 19.6% ($P < 0.001$). A number of previous cesarean sections increased the risk of PPH. Previous 1 to 2 (29.9% vs

17.7%) and previous 3 or more (4.6% vs 1.8%) $p < 0.001$. Cesarean section delivery was significantly associated with PPH as compared to the vaginal mode of delivery.

Table I: Significant risk factors for PPH			
Variables	PPH Group (n=217)	NON PPH Group (n=12958)	P Value
Education			
Illiterate	89 (41.0%)	4064 (31.4%)	0.001
Up to primary	44 (20.3%)	2034 (15.7%)	
Gestational age (weeks)			
< 37	70 (32.3%)	1421 (11.0%)	<0.001
Gravidity			
Multigravida	166 (76.5%)	8852 (68.3%)	<0.001
Previous cesarean section			
Yes	75 (34.6%)	2535 (19.6%)	<0.001

General anesthesia increased the risk of PPH as compared to spinal anesthesia (28.4% vs 3.1%) $p < 0.001$. Use of antibiotics was more common in women with PPH (77.2% vs 57.8%) ($P < 0.001$).

Use of prophylactic oxytocin for prevention of postpartum hemorrhage significantly reduced PPH (94.9% vs 97.9%) ($P < 0.001$). There was more chance of women developing PPH if oxytocin was not used prophylactically. Use of misoprostol, ergometrine and other uterotonics for prophylaxis of PPH are not useful for reducing postpartum hemorrhage as shown in table II.

Table II: Effect of Misoprostol and other Uterotonics on PPH			
Variables	PPH Group (n=217)	NON PPH Group (n=12958)	P Value
Misoprostol for Prevention of PPH (n=13162)			
Yes	150 (69.8%)	7077 (54.7%)	<0.001
No	65 (30.2%)	5870 (45.3%)	
Ergotamine for prevention of PPH			
Yes	87 (40.5%)	2806 (21.7%)	<0.001
No	128 (59.5%)	10141 (78.3%)	
Other uterotonics for prevention of PPH			
Yes	25 (11.6%)	188 (1.5%)	<0.001
No	190 (88.4%)	12759 (98.5%)	

Discussion

A tragic and preventable complication of the third stage of labor is PPH. It is still a major cause of maternal

morbidity and mortality in developing countries. In the UK it accounts for 10% of all direct maternal deaths.¹¹ This is in contrast with 27.1% of hemorrhage related deaths across the world.¹² This discrepancy is because most of the women in developing countries live in rural areas, often with no antenatal care and repeated short spaced child births due to lack of contraception. Moreover, deliveries are conducted at home by untrained birth attendants.¹³ The complications of pregnancy like anemia, hypertension, and multiple pregnancies remain undetected and the patient is brought to the hospital very late and usually in a morbid state. Traditional practices during puerperium result in further ill health.

The incidence of PPH in the present study was 1.6%. This is lower compared to the results of previous studies reported in Pakistan from Multan (3.9%)¹⁴ and in Khyber Agency (21.3 %) ¹⁵, in England it is 13% in 2011-2012¹⁶, while in Africa (10.5%).¹⁷

There were total 18 (47.3%) maternal deaths due to PPH in this survey. The results showed that the risk of PPH is significantly increased if the women delivered before arrival in the health facility which is significantly higher than reported from USA 11.3%.¹⁸ A study in France reported 33% maternal mortality from PPH.¹⁹ Health and Demographic Surveillance System (HDSS) data in rural western Kenya revealed 26% maternal mortality due to PPH.²⁰

Education status of women was significantly associated with PPH similar to a study conducted in Khyber Agency which revealed that almost 99.8% patients received no formal education.¹⁵ Educational status of the woman directly affects the health seeking behavior of parturient. It has an impact on the overall health of the patient and when anemic patients enter parturition they are less tolerant of any volume of blood loss. Thus, empowerment of women and awareness about PPH may help in decreasing its incidence.

Multigravidae were at significantly higher risk of PPH, in our study which is in contrast to other studies which did not demonstrate any relation between multiparity and major obstetric haemorrhage.^{21, 22} However in the study conducted in Khyber Agency Pakistan a positive association of PPH and multiparity¹⁵ was observed. Our study found a significant association between cesarean section and PPH similar to another study conducted in New Zealand which revealed two to the three-fold increased risk of PPH with cesarean section.²³ Preterm labor was also an independent risk factor for PPH in our study similar to a hospital-based cohort study of a

tertiary-care university maternity hospital in Montreal.²¹ Our study showed that general anesthesia predisposes women to PPH in general agreement with literature that shows that general anesthesia is associated with a higher blood loss than neuraxial anaesthesia (spinal, epidural).²⁴

Use of oxytocin for prevention of PPH in referral level facilities of Pakistan is a standard. It should be given in 100% women. The use of misoprostol along with oxytocin is challenged in this study as a negative association of misoprostol use with PPH was found (69.8% vs 54.7%) ($p < 0.001$). This is in contrast to several studies which report that misoprostol is as effective as oxytocin for active management of third stage of labor. One study suggested that misoprostol is more effective in reducing the blood loss and the duration of the third stage of labor as compared to oxytocin.²⁵ A study conducted in Karachi in 2014 showed that there is no difference in the management of third stage of labor whether oxytocin is used or misoprostol.²⁶ Our results are consistent with that of a systematic review of literature from Cochrane library and WHO recommendations that misoprostol is slightly less effective in preventing PPH. Severe PPH and need for other uterotonic use were more frequent with misoprostol. An important point raised in this study is that the combined use of oxytocin and misoprostol did not prove effective.²⁷ Similarly, another study in India showed that misoprostol use results in greater blood loss after delivery. This article recommended that larger studies should be conducted to prove the effect of misoprostol in active management of the third stage of labour.²⁸

Conclusion

Multiparity, preterm labor, cesarean delivery, prior cesarean section and lack of education were significantly associated with PPH. AMTSL can prevent PPH. Oxytocin remains the gold standard while misoprostol use should be considered for domiciliary or low resource facilities. Timely diagnosis and management of PPH can reduce severe maternal morbidity and mortality.

Strengths: This multicountry survey was conducted in busy referral level hospitals in Pakistan across the two populous provinces, namely Punjab and Sindh as well as the capital city Islamabad over a three-month period. The results high light the persistent poor national maternal health indices despite claims regarding various programs and initiatives by the successive Governments, NGO's and Donors

LIMITATIONS

Predisposing factors of PPH in labor such as prolonged labor were not studied. Only short-term (7 days postnatal) intra-hospital data was collected. A small number of survivors may have developed PPH in the remaining puerperal period. The data source, namely routine hospital records, could be suboptimal in view of the number of personnel involved and multiple sites.

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