

# The Causes of Post-Partum Hemorrhage in Patients Attending in a Tertiary Care Hospital

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## Abstract

**Background:** Post-partum hemorrhage is defined as excessive bleeding following a vaginal delivery or cesarean section of more than 500ml and 1000ml respectively. Post-partum hemorrhage is a potentially life-threatening complication of vaginal and cesarean delivery. The aim of the study was to identify the causes of PPH cases and find out modalities and maternal outcomes of PPH cases and different presentations of PPH patients, to identify the causes of primary & secondary PPH. **Methods:** This cross-sectional study was conducted at Dhaka Medical College & Hospital, Dhaka, Bangladesh during the period from July 2011 to December 2011. The total number of patients in the present study was 200. Patients were selected from those who developed PPH after vaginal delivery or LSCS or instrumental delivery. Patients who were admitted as cases of PPH after home or other institutional delivery. The data were entered into a computer and statistical analysis of the results was obtained by using windows-based computer software devised with Statistical Packages for Social Sciences version 24. **Results:** During the study period, 407 PPH cases were admitted and the incidence of PPH was 5.72% of the total obstetric cases. Out of 407 cases, 317 (77.89%) were primary PPH cases and 90 (22.11%) were secondary PPH. Among the study people, 89% of patients developed primary PPH, and only 11% developed secondary PPH, 77% of the patients developed no complications other than PPH. 0.5% of patients expired remaining 23% of the patients developed some kind of complication following PPH. **Conclusion:** Maternal mortality has been used traditionally as a measure of the quality of health care. Recently maternal mortality is being taken into account to assess the burden of the disease. Safe motherhood policies, systematic evaluation, aggressive and appropriate treatment, prompt resuscitation, and volume replacement minimize the potentially serious outcomes associated with PPH. Most of the patients can be managed at the upazilla level by properly trained personnel. Only one-tenth of the patients require surgical management with active management of third-stage labor. So detecting the complications as early as possible and early referred to the tertiary level hospital would be able to reduce the complications and will improve the maternal outcome.

**Keywords:** Post-partum hemorrhage (PPH), Maternal mortality, Uterine atony, Puerperal sepsis.

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## INTRODUCTION

Postpartum hemorrhage (PPH) is an important cause of maternal mortality and morbidity. In the developing world, it is estimated to count for 28% of maternal death [1]. The majority of these deaths (88%) occur within 4 hours of delivery [2]. In Bangladesh, PPH constitutes 26% of all maternal death [3]. PPH is a life-threatening complication and the leading cause of death among women of reproductive age group in developing countries. In Bangladesh, PPH remains the

number one killer of mothers. It is still an important issue in the developing world [4]. About 13% of all deliveries may result in PPH with a blood loss of more than one liter while life-threatening hemorrhage occurs 1 in 100 deliveries [5]. There are 6000,000 maternal deaths reported worldwide every year, and 99% of those occur in developing countries [6]. Postpartum hemorrhage accounts for approximately 25% of all maternal death worldwide and for up to 60% of death in some countries [7]. In industrialized countries, PPH usually ranks in the top three causes of maternal

mortality [8]. PPH is traditionally defined as blood loss greater than 500 ml during vaginal delivery or greater than 1,000 ml with LUCS. Another proposed definition of PPH is a 10% drop in Hb level [9]. The diagnosis of PPH therefore remains a subjective clinical assessment that includes any amount of blood loss that threatens the women's hemodynamic stability. Incidence of PPH in the USA is 2%-4% of all pregnancies [10]. According to Bangladesh Demographic & Health survey 2007, 15% of patients present with excessive bleeding during delivery [11]. So prevention and control of PPH are necessary to reduce the high incidence of PPH. Various surgical measures like ligation of the uterine artery [12], bilateral ligation of the internal iliac artery [13], ligation of the ovarian artery [14], and sometimes B-lynch suture can be trained. Hysterectomy is used as a last measure to save the life of the patient. This study was undertaken in a tertiary level hospital (Dhaka Medical College Hospital) in Bangladesh. So, our study on the cause of PPH among the patients admitted can give us a real picture of the cause of PPH and may help us to make a standard treatment protocol as well as reduce maternal mortality and morbidity.

## METHODS

This Cross-sectional study was conducted at the Dhaka Medical College & Hospital, Dhaka, Bangladesh from July 2011 to December 2011. The total number of patients was 200. Patients were selected from those who had developed PPH after vaginal delivery or LSCS or instrumental delivery. Patients who were admitted as cases of PPH after home or other institutional delivery. Procedures of collecting data: Review of admission registry, hospital indoor documents i.e. patient chart and operation notes. Two hundred patients with post-partum hemorrhage could be reached by the investigator during the specified period of six months. Informed consent was taken from each patient and in cases where the patient was very ill and was unable to provide consent, the legal guardian was asked for consent. The patients were allocated to the group of either primary PPH or secondary PPH according to their history. A detailed history from patients and their parties was taken about the time of developing PPH, duration of pregnancy, antenatal check-up frequency and status, parity and anemic status, mode of delivery, and management given by us and received outside the hospital were all examined carefully and recorded. Their pulse, BP, temp, edema, anemia, jaundice, signs of any infection, subinvolution of uterus, whether the placenta was retained or not, and local injury to the genital tract were examined. Blood transfusion was needed or not, history of any bleeding disorder, any history of blood transfusion reaction, or complications developed due to PPH were assessed. The data were entered into a computer and statistical analysis of the results was obtained by using windows-based computer software devised with Statistical Packages for Social Sciences version 24.

## RESULTS

Table 1 shows that the mean age of the patients was 28.05 years with a 5.29 standard deviation, the median age was 28.64 years and the age range was 18-38 years. Patients of 20 or less was 5%, (10), 21-25 years was 21%, 42, 26-30 years was 46%, 91, 31-35 years was 25%, (50) and 36- above years was 4%, (7). Table 2 shows low parity (0-1) for patients who developed PPH of 21%, (42). Medium parity i.e. (2-4) patients who developed PPH 49%, (98), High parity i.e. ( $\geq 5$ ) patients who developed PPH 30%, (60). Out of the 200 cases, only 37.5%, (75) of the patients received antenatal care and 62.5%, (125) of the patients did not receive antenatal care. This data is statistically significant. Out of the 200 cases, only 68%, (136) of the patients were anemic who developed PPH and 32%, (64) were not anemic. The result shows that anemic patients are more prone to develop PPH than patients who were not anemic. Among the study people 89%, (178) patients developed primary PPH, and only 11%, (22) developed secondary PPH. Out of the 200 cases, only 27.59%, (55) ended in preterm delivery, 65%, (130) in term delivery, and 7.5% (15) in post-dated delivery. Sometimes prematurity and post-dated pregnancy predispose the retained placenta which is often the cause of PPH. Moreover, the incidence of PPH is more in term pregnancy. Table 6 shows vaginal delivery in 77.5%, (155) of the patients assisted vaginal delivery in 2.5%, (5) of the patients, and LSCS in 20%, (40) of the patients. The study shows that the patients who developed PPH delivered the baby at home in 46.5%, (93) cases, at hospitals below the tertiary level in 12.5%, (25) cases, and at tertiary level hospitals (MMCH) in 41%, (85) cases. Table 9 shows predisposing factors of PPH. These are antepartum hemorrhage 11%, (22) PET or eclampsia 13%, 26. Jaundice 3%, 6 chronic hypertension 6.50%, (13), overdistension of the uterus due to multiple pregnancies or polyhydramnios 10%, (20), gynecological problems like fibroid uterus, Ca-cervix, Cervical polyp 2.5%, (5), obstructed labor 21.10.5%, (5), instrumental delivery (2.5%). Prolong 3rd stage of labor 4.00. Figure 1 shows among the study people (200 Cases) various causes were detected. These are uterine atony 48%, (96), retained placenta 27%, (54), retained bits of placenta 6%, (11), genital tract injury 7%, (14), inversion of uterus 2%, (3), ruptured uterus 3%, (5), infection 4%, (8), combination of atony and traumatic 3%, (5) and Coagulation disorder 2%, (4). Table 10 shows the number of units of blood transfused during the management of postpartum hemorrhage cases. 4%, (8) of patients did not require a blood transfusion. 26%, (52) patients required 01 unit of blood, and 70%, (40), patients required more than 01 unit of blood transfusion. 2%, (4) of the patients were cured by oxytocin therapy. 31%, 62 of the patients required oxytocin and misoprostol therapy as a uterotonic agent and were cured. 7%, (14) of patients required repairing of genital tract injury. Manual removal of the placenta was done in 27%, (54) cases. Bimanual compression

controlled PPH in 11%, (22) cases. Intrauterine tamponade was done in 8%, (16) cases, Dilation and curettage were required in 9% (18) cases, and laparotomy followed by hysterectomy was required in

7%, (4) cases. Laparotomy followed by other procedures like- repair of rupture uterus 1% (2), B-Lynch 1.5% (3), and ligation of vessels was done in 0.5% (1) cases.

**Table 1: Age group (n=200)**

Age group	Frequency	Percent	Mean	Median	Std. Deviation	Maximum & Minimum
20 or less	10	5%	28.05			18&38
21-25	42	21%				
26-30	91	46%		28.64	4.86	
31-35	50	25%				
36-Above	7	4%				

**Table 2: Parity (n=200)**

Parity	No. of patients	Percent
Low Parity (0-1)	42	21%
Medium Parity (2-4)	98	49%
High Parity ( $\geq 5$ )	60	30%

**Table 3: Patient receiving antenatal care (n=200)**

Antenatal Care	No. of patients	Percentage
Received	75	37.5%
Did not receive	125	62.5%

**Table 4: Patients anemic status during admission (n=200)**

Anemic Status	No. of Patient	Percent
Anemic patient	136	68%
Not anemic patient	64	32%

**Table 5: Duration of Pregnancy (n=200)**

Duration of pregnancy	No. of patients	Percent
Preterm	55	27.59%
Term	130	65%
Post dated	15	7.5%

**Table 6: Mode of delivery (n=200)**

Mode of delivery	No. of patients	Percent
Vaginal delivery	155	77.5%
Assisted delivery	5	2.5%
Delivery by LSCS	40	20%

**Table 7: Place of delivery (n=200)**

Place of delivery	No. of patients	Percent
Home	93	46.5%
Hospital below tertiary level	25	12.5%
Tertiary level hospital	85	41%

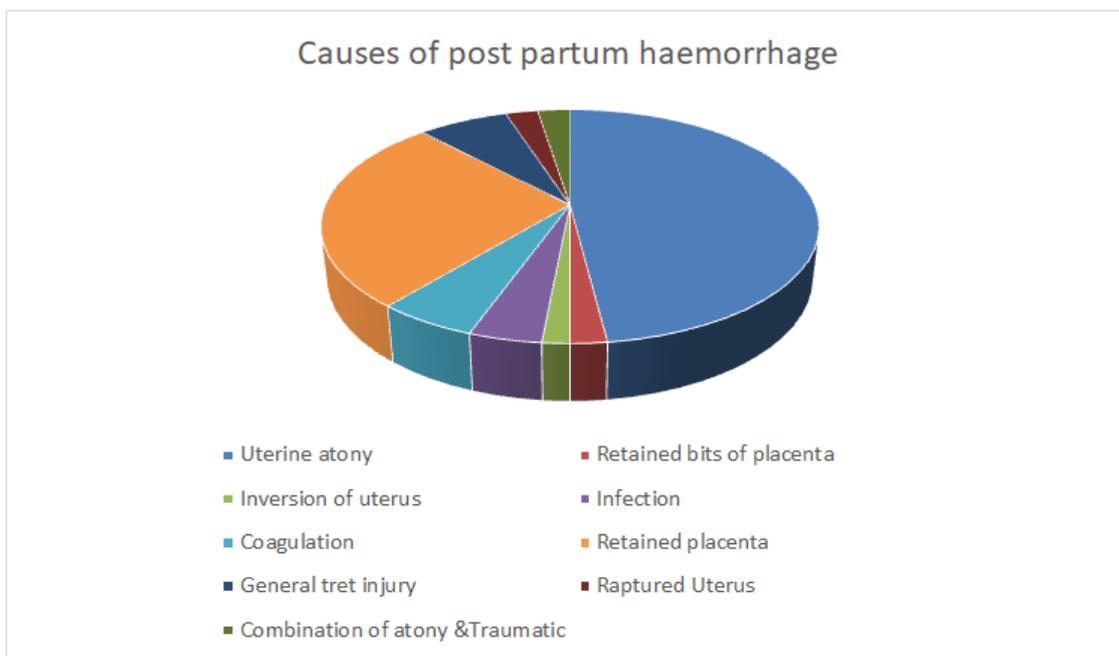
**Table 8: Type of PPH (n=200)**

Type of PPH	No. of patients	Percent
Primary	178	89%
Secondary	22	11%

**Table 9: Predisposing factors of PPH (n=200)**

Condition	No. of patients	Percent
APH	22	11.00%
PET/Eclampsia	26	13.00%
Jaundice	6	3.00%
Hypertension	13	6.50%

Condition	No. of patients	Percent
Over distension of uterus	20	10.00%
Gynaecological	5	2.50%
Obstructed labor	21	10.50%
Prolonged labor	30	15.00%
Initiation or augmentation of labor by oxytocin	40	20.00%
Instrumental delivery	5	2.50%
Prolong 3rd stage of labor	8	4.00%
P/H/O PPH	4	2.00%



**Figure 1: Causes of postpartum hemorrhage (n=200)**

Figure 1 Pie chart showing causes of PPH.

**Table 10: Blood transfusion required (n=200)**

No. of Blood Unit	No. of patients	Percent
Not required	8	4%
1 unit	52	26%
>1 unit	140	70%

**Table 11: Modalities of management (n=200)**

Condition	No. of patients	Percent
Oxytocin therapy	4	2%
Oxytocin & misoprostol therapy	62	31%
Repair of the genital tract injury	14	7%
Removal of placenta (manual)	54	27%
Bimanual compression	22	11%
Intrauterine taponads	16	8%
DE&C	18	9%
Laparotomy followed by hysterectomy	4	7%
Laparotomy followed by other procedures like		
B-Lynch	3	1.5%
Repair of ruptured uterus	2	1%
Ligation of vessels	1	0.5%

**Table 12: Complications associated with PPH (n=45)**

Type of complication	No. of patients	Percent
Shock	30	65%
Puerperal sepsis	8	17%
Transfusion reaction	1	2%
Renal failure	2	4%
Pulmonary embolism/thrombosis/thrombophlebitis	2	4%
Death	3	7%

## DISCUSSION

Postpartum hemorrhage (PPH) still is a challenging problem for obstetricians. PPH remains a significant complication of childbirth in many developed and developing countries. Although most can be treated successfully with conservative measures such as medication, about 10% of the women with PPH require major surgical procedures and even hysterectomy to save their lives [15]. It has been estimated that PPH increases the risk of morbidity 50 times, and has nearly 5 times higher morbidity than mortality. In developing countries like Bangladesh-PPH is one of the leading obstetric causes of maternal mortality [16, 17]. Finding show the characteristics of the study subjects out of 200 cases the range of age was 18-38years and mean age was 28.05, 4.86 (SD), and the median age was 28.64 years. A study by Naz *et al.*, showed ages of the patients ranged from 18-45 years with a mean age of 31,56+ 2 S.D years [18]. The majority of the patients, 72 (43.90%), were in the age group of 31-40 years, as shown in table-1. Another study by Chohan *et al.*, showed the major predisposing factor was grand multiparity in twenty-five (50%) patients [19]. Another study by Farhana *et al.*, showed fourteen (11.8%) patients were less than 20 years of age, 38(32.2%) patients belonged to the age group of 20-30 years, and 44 (37.2%) patients belonged to 31-40 year age group while 22 (18.6%) patients were more than 41 years of age [20]. The table shows low parity (0-1) for patients who developed PPH with a frequency of 21%, (42). Medium parity Le (2-4) patients who developed PPH 49%, (98), High parity i.e. (≥5) patients who developed PPH 30%, (60). In the study of Farhana *et al.*, it was observed that eighteen (15.2%) patients were primiparas, 31(26.2%) were multipara and 69(58.4%) patients were grand multiparas [20]. A study by Talat *et al.*, showed primiparas were 18(10.97%), 52 (31.70%) were multipara, 57 (34.75%) were grand multipara and 37(22.56%) were more than para 9, In our experience multiparous women are more prone to develop PPH, while several studies have shown that grand multiparity predisposes to PPH [18]. Gestational age in this study showed preterm, term, and post-term pregnancies. PPH was 65% in term pregnancy 27.5% in pre-term pregnancy and 7.5% in postdated pregnancies. Sometimes prematurity and postdated pregnancy predispose to the retained placenta which is one of the causes of PPH. Regarding the antenatal care of the 200 patients only 37.5% had antenatal care; the rest 62.5% had no antenatal care at all. In developing countries like

Bangladesh, these statistics are very much significant. For a lack of antenatal care, high-risk patients with predisposing factors of PPH cannot be identified and proper management protocol not be established before the occurrence of complications like PPH. Another study showed that out of fifty, fifteen (30%) were booked patients [19]. Table VII- shows vaginal delivery in 77.5%, (155) of the patients assisted vaginal delivery in 2.5 %, (5) of the patients, and LSCS in 20%, (40) of the patients. Table VIII- shows that the patients who developed PPH delivered the baby at home in 46.5%, (93) cases, at hospitals below tertiary level in 12.5%, (25) cases, and tertiary level hospitals in 41 %, (85) cases. That means most patients with PPH cannot read in due time. They develop complications or die at home before reaching the hospital due to massive hemorrhage. Another study by Bibi *et al.* showed Patients delivered by traditional birth attendants in 70 (51.4%), lady health workers in 40 (29.47), and by doctors in 26 (19.2%) [21]. Among the study people 89%, (178) patients developed primary PPH, and only 11% (22) developed secondary PPH. It indicates that the majority of PPH were primary which occurs within 24 hours of delivery. So the complications of primary PPH would be reduced, if proper management of primary PPH can be given by the trained persons who conduct deliveries, it would be able to reduce the PPH-related deaths in the near future. In the study by Farhana *et al.*, they showed that 118 (9.5%) patients had PPH out of 1231 patients. Of these 118 patients, 98 (83%) had primary PPH while 20(16.9%) had secondary PPH [20]. Table 9 shows predisposing factors of PPH. These are antepartum hemorrhage 11%, (22) PE or eclampsia 13%, 26. Jaundice 3%, 6 chronic hypertension 6.50%, (13), overdistension of the uterus due to multiple pregnancies or polyhydramnios 10%, (20), gynecological problems like fibroid uterus, Cervix, Cervical polyp 2.5%, (5), obstructed labor 21. 10.5%, (5), instrumental delivery (2.5%). Prolong 3rd stage of labor 4.00 %, (8), Previous history of PPH 2.00%, (4). So these risk factors should be considered carefully during the antenatal period and delivery. Among the study people (200 Cases) various causes were detected. These are uterine atony 48%, (96), retained placenta 27%, (54), retained bits of placenta 6%, (11), genital tract injury 7%, (14), inversion of uterus 2%, (3), ruptured uterus 3%, (5), infection 4% (8), combination of atony and traumatic 3%, (5) and Coagulation disorder 2% (4). In a study by Talat *et al.*, the placenta accounted for 24 (14.63%) cases of PPH

[18]. PPH due to retained placental Pakistan showed Retained pieces occurred in 14 (8.54%) cases. Thirteen (7.93%) cases of PPH followed APH. PPH due to coagulation disorders was seen in 3 (1.83%) cases, 2 due to liver disease, and 1 case due to thrombocytopenia. In the study of Farhana *et al.*, it was observed that regarding causes of PPH, the most common cause was uterine atony found in 76(64.4%) cases, followed by perineal and vaginal tears in 41(34.7%) and prolonged labor in 29(24.5%) [20]. Another study by Bibi *et al.* showed Uterine atony was identified as a major cause of 96 (70.5%), traumatic lesions of the genital tract, 40 (29.4%) [21]. Induced labor, 33 (24.3%), augmented labor 62 (45.5%). The most important cause was uterine atony, 96 (70.5%), and traumatic lesions of the genital tract, 40 (29.4%). Factors causing uterine atony were augmented labor 20 (20.9%), prolonged labor 21 (21.9%), retained placental tissues, 11 (12.5%), retained placenta, 11 (11.4%) Couvelliar uterus, 10 (10.4%), placenta Previa, 8 (8.3%), placenta increta, 7 (7.3%), chorioamnionitis 5 (5.2%), and multiple pregnancy, 2 (2.1%). Risk factors, grand multiparity 70 (51.5%), antepartum hemorrhage 12 (8.9%), instrumental delivery 10(7.3%), previous PPH, 6 (4.5%), chorioamnionitis, 5 (3.6%), multiple pregnancy, 2 (1.5%), no risk factor, 21 (15.4%). The number of units of blood transfused during the management of postpartum hemorrhage cases. was 4 %, (8) patients did not require a blood transfusion. 26%, (52) patients required 01 unit of blood, and 70 %, (140), patients required more than 01 unit of blood transfusion. Regarding management modalities, 2%, (4) of the patients were cured by oxytocin therapy. 31%, 62 of the patients required oxytocin and misoprostol therapy as a uterotonic agent and were cured. 7%, (14) of patients required repairing of genital tract injury. Manual removal of the placenta was done at 27%. (54) cases. Bimanual compression controlled PPH in 11%, (22) cases. Balloon therapy was done in 8%, (16) cases, Dilation and curettage were required in 9%, (18) cases, laparotomy followed by other procedures like- repair, B-Lynch, ligation of vessels was done in 3%, (6) cases and laparotomy followed by hysterectomy was required in 7%, 4 cases. Various complications were followed by postpartum hemorrhage in the study people. Among them 15%, (30) developed shock, 0.5%, (1) developed puerperal sepsis. 4%, (8) developed transfusion reaction, 1%, (2) developed renal failure. Pulmonary embolism/ thrombosis/ thrombophlebitis associated in 1%, (2) cases. 1.5%, (3) patients expired. The remaining 77% of the patients developed no complications and returned to their healthy life. Failure of the uterus to contract adequately after childbirth (atonicity) is the most common cause of PPH, the leading cause of maternal death in Africa and Asia [22]. Overall hospital deliveries had a better outcome, milder course, and lesser complications due to active management of the 3rd stage of labor and early intervention for management of PPH.

## CONCLUSION

The recent employment of skilled birth attendants (SBAS) at the grass-root level has become great hope for preventing maternal morbidity and mortality from preventable causes like PPH. They can be involved in the community-based study on PPH or other issues of maternal health successfully. We hope that further study initiatives would be taken by the future researcher to decrease the mortality and morbidity from PPH.

## RECOMMENDATION

The recommendation mentioned in the present study may guide the policy maker and the future researcher as well. To avoid maternal morbidity and mortality, it is essential to find out the avoidable factors responsible for the development of PPH and their consequences. The two vital role players in this context are standard antenatal care and skilled birth attendants. Despite the fact that good antenatal care helps recognize risk factors for the development of PPH and also in the timely diagnosis of preexisting health problems, it is still being observed in many studies that even with the recognition and proper management of risk factors. PPH cannot be prevented in most cases. However, properly organized antenatal visits provide an opportunity to educate the women regarding the importance of skilled birth attendants and better utilization of emergency obstetric services.

## REFERENCES

1. Walder, J. (1997). Misoprostol: preventing postpartum haemorrhage. *Modern Midwife*, 7(9), 23-27.
2. Birperth. (1995). Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies. Reports on baseline Survey for Assessment of EOC services in Bangladesh.
3. Mathai, M., Gülmezoglu, A. M., & Hill, S. (2007). Saving women's lives: evidence-based recommendations for the prevention of postpartum haemorrhage. *Bulletin of the World Health Organization*, 85(4), 322-323.
4. Khan, K. S., Wajdyla, D., Sayl, L., Gulmezoglu, A. M., Van Look, P. F. (2006). WHO analysis of causes of maternal death: A Systemic review. *Lancet*, 367, 1066-1074.
5. Macqhail, S., & Fitzgerald, J. (2001). Massive postpartum hemorrhage. *Curr Obstet Gynecol*, 11, 106-114.
6. Bouwmeester, F. W., Bolte, A. C., & Van Geijn, H. P. (2005). Pharmacological and surgical therapy for primary postpartum hemorrhage. *Current pharmaceutical design*, 11(6), 759-773.
7. ICDDR, B Publication. (2007). ICDDR, B Periodical Mother New Bor News, 2(2), 2007> Section 1: Postpartum Hemorrhage an overview files.

8. Smith, J. R. (2006). Postpartum Hemorrhage e Medicine Specialties> obstertric & gynaecology, June 13, 2006.
9. Combs, C. A., Murphy, E. L., & Laros Jr, R. K. (1991). Factors associated with postpartum hemorrhage with vaginal birth. *Obstetrics and gynecology*, 77(1), 69-76.
10. Michael, P. W. 2006. Pregnancy, Postpartum Hemorrhage, e Medicine Specialties> Emergency Medicine> Obstertic & Medicine Specialties> MaySO, 2006.
11. Bangladesh Demographic & health Survey. (2007). National Institute of Population Research & Training (NIPORT) Dhaka, Bangladesh.
12. Waters, E. G. (1952). Surgical management of postpartum hemorrhage with particular reference to ligation of uterine arteries. *American journal of obstetrics and gynecology*, 64(5), 1143-1148.
13. Evans, S. T. E. P. H. E. N., & McSHANE, P. A. T. R. I. C. I. A. (1985). The efficacy of internal iliac artery ligation in obstetric hemorrhage. *Surgery, gynecology & obstetrics*, 160(3), 250-253.
14. Cruikshank, S. H. (1983). Surgical control of pelvic hemorrhage: Ovarian artery ligation. *Am J Obstet Gynecol*, 147, 724-725.
15. Richard, J., & Kumar, M. (2001). Management of massive post partum journal of obstetrics and gynecology, 108, 420-422
16. Kaul, V., Bagga, R., Jain, V., & Gopalan, S. (2006). The impact of primary postpartum hemorrhage in" nearmiss" morbidity and mortality in a tertiary care hospital in north India. *Indian J Med Sci*, 60(6), 233-240.
17. Naz, H., Sarwar, I., Fawad, A., & Nisa, A. U. (2008). Maternal morbidity and mortality due to primary PPH--experience at Ayub Teaching Hospital Abbottabad. *J Ayub Med Coll Abbottabad*, 20(2), 59-65.
18. Naz, T., & Hassan, L. (2010). Primary postpartum hemorrhage; Profile at a tertiary care hospital. *Journal of Medical Sciences*, 18(1), 49-53.
19. Chohan, A., Butt, F., Mansoor, H., & Falak, T. (2006). Primary postpartum hemorrhage: Outcome of different treatment measures. *Biomedica*, 22(1), 16-20.
20. Yousef, F., & Haider, G. (2009). Postpartum hemorrhage an experience at tertiary care hospital. *J Surg Pak Int*, 14, 80-84.
21. Bibi, S., Danish, N., Fawad, A., & Jamil, M. (2007). An audit of primary post partum haemorrhage. *Journal of Ayub Medical College Abbottabad*, 19(4), 102-106.
22. Dildy Iii, G. A. (2002). Postpartum hemorrhage: new management options. *Clinical obstetrics and gynecology*, 45(2), 330-344.