



THE FREQUENCY OF POSTPARTUM HEMORRHAGE IN PREGNANT WOMEN WITH PREVIOUS UTERINE SURGERIES

Ashraf Talaat Abdelfattah, Wael Sabry Nossair, Ahmed Ismail Mohammed, Ahmed Mohamed Aboul Fotouh

Article History: Received: 20.05.2023

Revised: 25.06.2023

Accepted: 01.07.2023

Abstract

Background: The global burden of postpartum hemorrhage (PPH) in women with placenta previa is a major public health concern. Although there are different reports on the incidence of PPH in different countries, to date, no research has reviewed them.

Aim: The aim of this work was to estimate the magnitude of the postpartum hemorrhage in pregnant women with previous uterine surgeries to reduce maternal mortality and morbidity of patients.

Methods: This a cross sectional study included 150 Females in child bearing period who underwent normal vaginal delivery or cesarean section complicated by PPH.

Results: there was 132 (88%) had uterine massage, 132 (88%) had Uterotonic drugs, all of them had fluid replacement, all of them had intrauterine tamponade, balloon. The mean post-treatment hemoglobin was 7.4 ± 1.1 , there was 144 (96%) had hemoglobin drop, 14 (9.3%) had DIC, and 65(43.3%) had ICU admission.

Conclusion: The most common risk factors of PPH were uterine atony, placental abnormalities, history of previous cesarean sections and previous gynecological operations. Prediction of PPH can help in selection of subsequent delivery type and preparation and improvements in treatment, thus a decrease in the complications and make the necessary preparations before delivery.

Keywords: Frequency; Postpartum Hemorrhage; Pregnant Women; Uterine Surgeries.

Obstetrics and Gynecology department, Faculty of Medicine Zagazig University

Resident of Obstetrics & Gynecology at heliopolis hospital

Corresponding author: Ahmed Mohamed Aboul Fotouh

Email: goldenstone6261@gmail.com

DOI: 10.48047/ecb/2023.12.Si8.636

Introduction

Postpartum hemorrhage (PPH) is widely recognized as the most important cause of major obstetric morbidity and mortality worldwide. Most common definition of PPH is loss of blood ≥ 500 mL after vaginal birth or ≥ 1000 mL after cesarean delivery (1).

According to definition used, the rates vary between 3 and 6 % for PPH and 0.5–1 % for severe PPH requiring transfusion or resulting in coagulopathy. Despite improvements in management strategies, population-based studies demonstrated that prevalence of PPH has been gradually increasing in several countries (2).

PPH is called primary, which occurs within 24 h following delivery, or secondary, which occurs 24 h to 12 weeks postpartum (3). Most significant percentage of the primary PPH corresponds to uterine atony, and other causes include placental abnormalities, genital tract lacerations and trauma, coagulation disorders and retained uterine contents that can present as unique or contributing factors (4). Complications from postpartum hemorrhage include orthostatic hypotension, anemia, and fatigue, which

may make maternal care of the newborn more difficult. Post-partum anemia increases the risk of post-partum depression. Blood transfusion may be necessary and carries associated risks (5).

The aim of this work was to estimate the magnitude of the postpartum hemorrhage in pregnant women with previous uterine surgeries to reduce maternal mortality and morbidity of patients.

Patients and Methods

This study was conducted on patients delivered at hospital in Obstetrics & Gynecology Department, Faculty of Medicine, Zagazig University Hospital. Assuming the target population was 500 pregnant women and the estimated prevalence rate of postpartum hemorrhage was 16.6%. At 95% CI and effect size =1. The estimated sample size was 150 pregnant women.

Open epi.

Inclusion criteria: The patient was selected according to these criteria: Cases suffered from PPH, previous uterine surgeries and cases delivered both vaginal and C.S

Exclusion criteria: Women who received a blood transfusion because of postpartum anemia, without evidence of excessive hemorrhage, pregnant women with no history of previous uterine surgeries

Operational design:

Type of study: This is a cross sectional study.

Methods:

History: Upon admission each patient was asked about her personal, menstrual, family, past and obstetric history, detailed medical history and detailed drug history

All patients were subjected to:

Personal history: Name – age – parity – occupation – duration of marriage, address, special habits of medical importance as smoking and Family history of medical diseases as hypertension or diabetes mellitus.

Menstrual history: Gestational age of present pregnancy determination according to last menstrual period (if patient sure about the date and had 3 regular cycles before the pregnancy or has ultrasound report done in first trimester) and confirmation by ultrasound assessment.

Present history: Associated symptoms: (bleeding “primary postpartum hemorrhage” , abdominal pain). History suggesting risk factors or causes of PPH

Obstetric history: for each previous delivery: Number, antepartum period (previous preterm labor or abortion, ectopic pregnancy, and outcome), postpartum and puerperium period, previous history of postpartum hemorrhage and history of process of labor and delivery: course of labor, spontaneous or assisted vaginal delivery, partogram, indication of caesarean section, fetal outcome and place of delivery, and history of bleeding if delivered outside as regard time, onset, and amount.

Surgical history: Any cervical surgeries, previous cesarean section, myomectomy, ovarian cystectomy, dilatation and curettage (D&C) after abortion and previous rupture uterus

Medical history: Hypertension, diabetes mellitus, liver, renal diseases, coagulopathies, Anemia, APH, PPH, blood transfusion, and of previous uterine surgery

Routine investigation: Complete blood picture, coagulation profile, liver & Kidney function, random blood sugar and urine analysis for proteinuria.

General Examination: Vital signs (Blood pressure, pulse, temperature, respiratory rate and body mass index (BMI)), chest & heart examination and limbs examinations.

Abdominal examination: Patients with persistent excessive vaginal bleeding after vaginal delivery were assessed immediately for contraction, tone, fundal level, any masses, tenderness, and ascites

Local examination: Estimated blood loss, Quantify the amount of blood loss by collecting blood in graduated volumetric containers, using visual aids that correlate the size and appearance of blood on specific surfaces (eg, maternity pad), examination under anesthesia (uterus, cervix, vagina, and perineum), for trauma, for uterine atony retained placental tissues, Post cesarean, it may not be recognized when blood is retroperitoneal, confined to the uterine cavity after closure of the uterine incision,

Obstetric examination: All patients received primary management in the obstetric department, including vaginal gauze packing, uterine massage, and manual extraction of the placenta.

Per vaginal examination: Detailed vaginal examination using a retractor, intravenous administration of oxytocin, methyl-ergonovine, and intra-rectal misoprostol

Ultrasound examination: The ultrasound machine with a curvilinear abdominal probe, 3.5 Hertz device at radiology department at Zagazig University Hospital

Other investigations: Type and cross match for multiple units of packed red cells, complete blood picture (Hb. level and Hct. value at admission and 6 hours after delivery, coagulation profile, PTT, PT and INR, renal function tests, liver function tests, urine analysis and etiology (Uterine muscle state , birth canal injury ,retained tissue and placental site)

Provision of privacy: There are adequate provisions to maintain privacy of participants and Confidentiality of the data, the patient name were replaced by serial number, her address was confidential.

Administrative design: The study protocol was submitted for approval by Zagazig University Institutional Review Board (IRB).

Statistical Analysis: Statistical analyses were performed in SPSS version 16.0 (SPSS, Inc., Chicago, IL, USA) and presented as mean \pm standard deviation (SD). T-test was used to assess significant differences between the groups. P-value of <0.05 was considered statistically significant.

Results

This a cross sectional study included 150 Females in child bearing period who underwent normal vaginal delivery or cesarean section complicated by PPH

This cross sectional study was carried out on 150 females in Zagazig university hospitals; their age was ranged from 20 years to 45 years with median 29 years. 116 females (77.3%) were ranged from (20-30) years, 29 females (19.3%) were ranged from (31-40) years and only 5 females (4.5%) were ranged from (41 – 45) years as shown in **Figure (1)**.

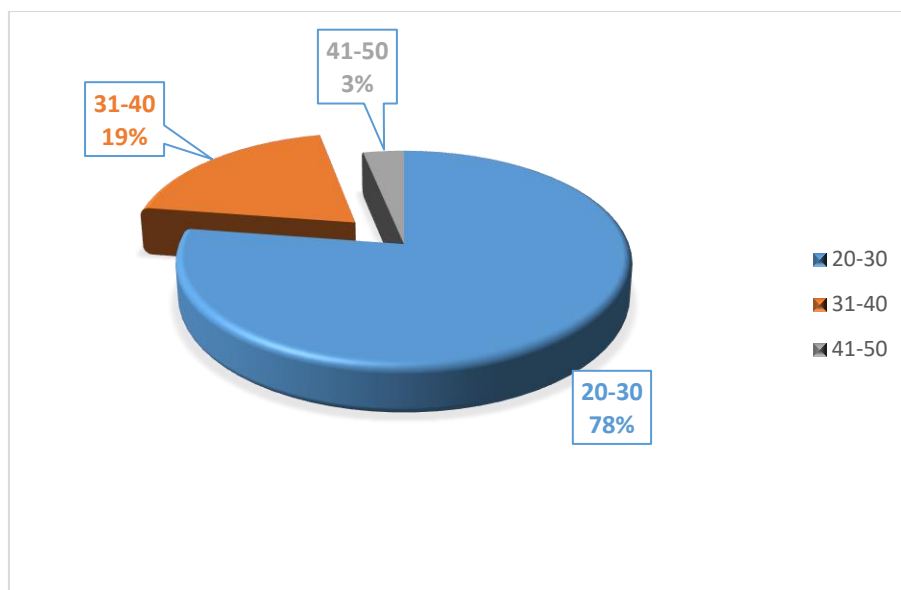


Fig (1): Distribution of all studied cases according to Age category

Obstetric history was presented in Figure (2), the most common Obstetric history were G3 P2 A0 in 38 patients (25.3%), G2 P1 A0 was in 27 patients

(18%), G4 P3 A0 in 20 patients (13.3%) and PG in 25 patients (16.7%).

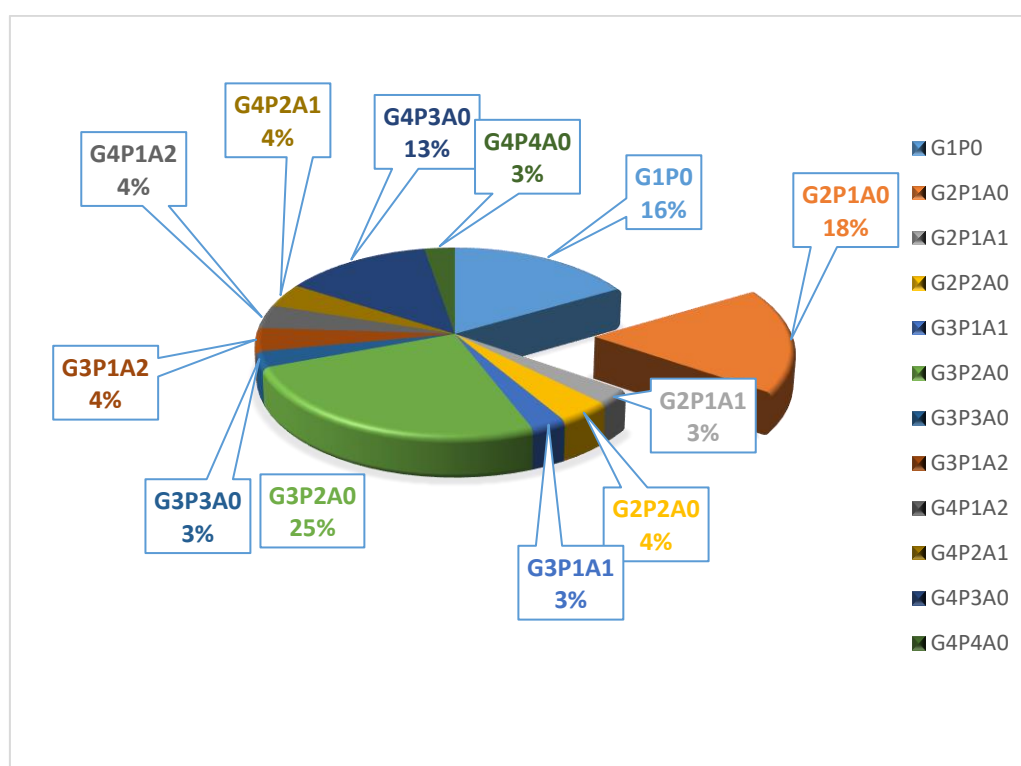


Fig. (2): Distribution of all studied cases according to obstetric history

As a regard of previous operation done for all patients, 33 patients were undergoing general operations as appendectomy in 21 patients (14%) and Appendectomy and cesarean in 12 patients (8%) while 117 patients were undergoing gynecological

operation as cesarean in 99 patients (66%), ovarian cystectomy in 4 patients (2.6%), salpingectomy and cesarean in 2 patents (1.3%), laparoscopy in 2 patients (1.3%) and ovarian cystectomy and cesarean in 2 patients (1.3%) as shown in Figure (3).

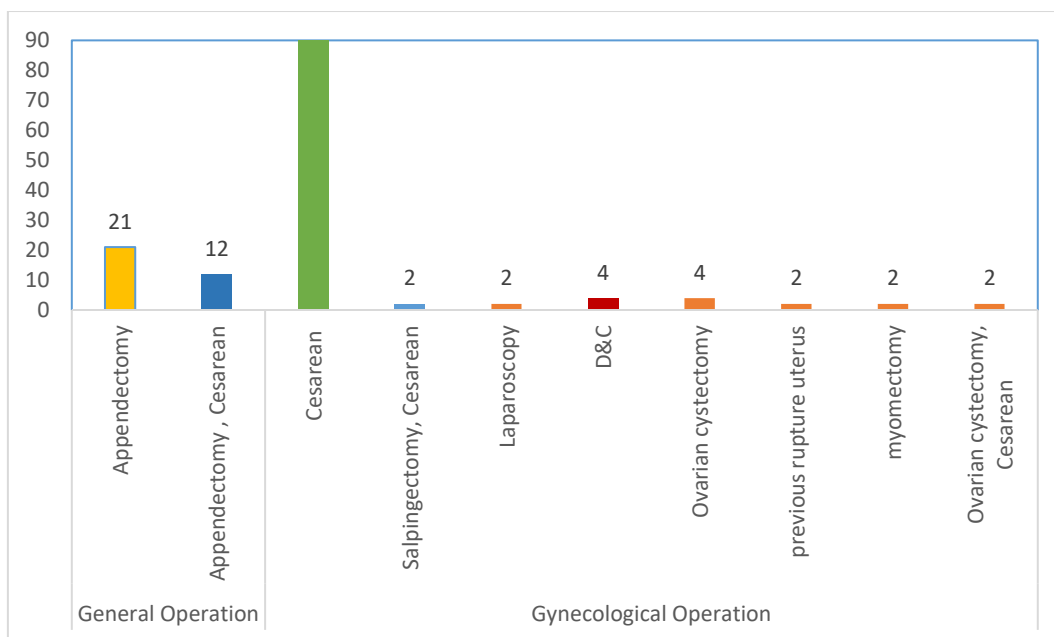


Fig (3): Distribution of all studied cases according to previous operation

57 patients (38%) were undergoing only one operation, 54 patients (36%) were undergoing 2 operations, 26 patients (17.3%) were undergoing 3

operations while 13 patients (8.7%) were undergoing 4 operations as shown in **Figure (4)**.

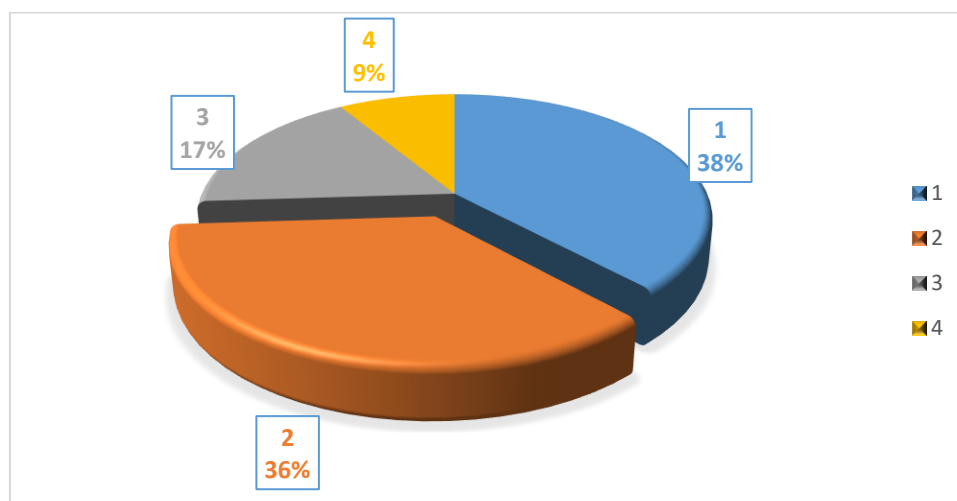


Fig (4): Distribution of all studied cases according to Number of operation

Figure (5) shows that there were 55 (36.7%) of the studied women had hypertension, and there were 36 (24%) of them had diabetes.

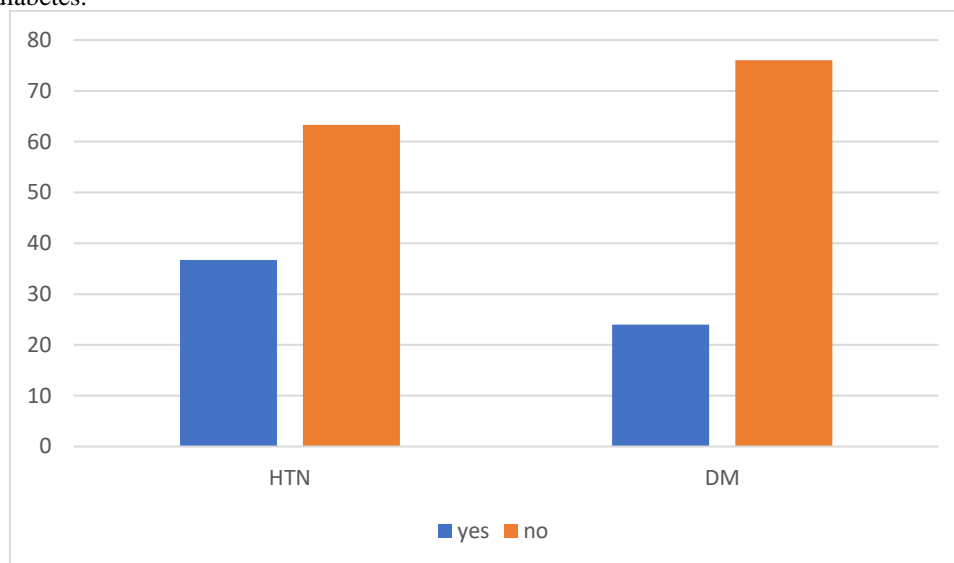


Fig (5): Distribution of the studied women regarding clinical history

Table 1: Distribution of the studied women regarding ultrasound findings

	(n=150)
No of fetuses	
Single	119 (79.3%)
Multiple	31 (20.7%)
Fetal age	
Preterm	30 (20%)
Full term	120 (80%)
Fetal viability	
Alive	138 (92%)
Dead	12 (8%)
Placenta site	
Normal	138 (92%)
Abnormal	12 (8%)
Rupture uterus	
Yes	9 (6%)
No	141 (94%)
Birth canal injury	
Yes	9 (6%)
No	141 (94%)
Retained tissue	
Yes	9 (6%)
No	141 (94%)
Uterine muscle atony	
Yes	119 (79.3%)
No	31 (20.7%)

In table 1 there was 119 (79.3%) of the studied cases had single fetus, 120 (80%) of them were full term, 138 (92%) were alive. As regard to placenta, there

were 138 (92%) had normal placenta, 9 (6%) had rupture uterus, 9 (6%) had birth canal injury, 9 (6%)

had retained tissue, and 119 (79.3%) had uterine muscle atony.

Table 2: Distribution of the studied women regarding management

	(n=150)
Uterine massage	
Yes	132 (88%)
No	18 (12%)
Uterotonic drugs	
Yes	132 (88%)
No	18(12%)
Fluid replacement	
Yes	150 (100%)
No	0 (0)
No of received packed RBCs	4 ± 1.4
No of plasma received	2.2 ± 1.2
Intrauterine tamponade, balloon	
Yes	0 (0)
No	150 (100%)
Hb post	7.4 ± 1.1
Hb drop	
Yes	144 (96%)
No	6 (4%)
DIC	
Yes	14 (9.3%)
No	136 (90.7%)
ICU admission	
Yes	65(43.3%)
No	85 (56.7%)

Table 2 shows that there was 132 (88%) had uterine massage, 132 (88%) had Uterotonic drugs, all of them had fluid replacement, all of them had intrauterine tamponade, balloon. The mean posttreatment hemoglobin was 7.4 ± 1.1 , there was 144 (96%) had hemoglobin drop, 14 (9.3%) had DIC, and 65(43.3%) had ICU admission.

There was 9 (%6) had Hysterectomy, 18(12%) had uterine artery ligations, 9 (%6) had Internal iliac artery ligation, all of them had no compression sutures, only 6 (4%) had died and 3 (2%) had Thromboembolic complication as in fig 6, 7.

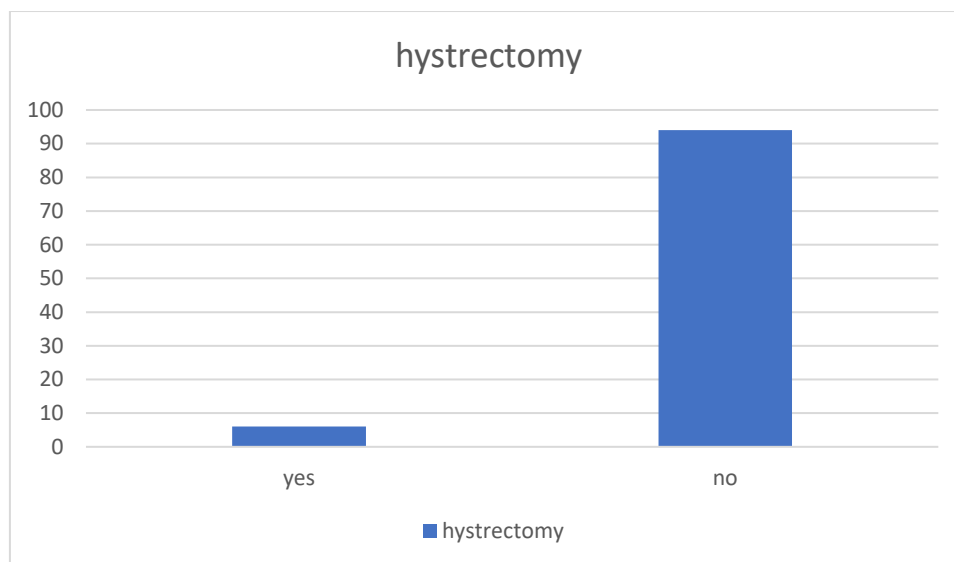


Fig (6): Distribution of the studied women regarding hysterectomy

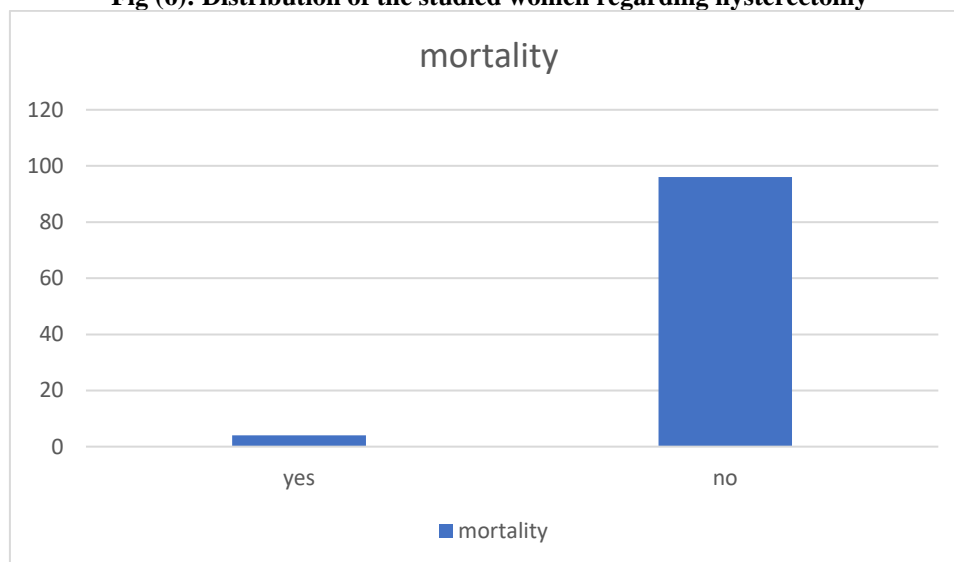


Fig (7): Distribution of the studied women regarding mortality

Discussion

With the increasing prevalence of postpartum hemorrhage, well-designed cohort studies and randomized clinical trials that evaluate interventions that are critical for predicting, preventing, and managing postpartum hemorrhage remain a high priority (6).

The aim of work of the current study was to estimate the magnitude of the postpartum hemorrhage in pregnant women with previous uterine surgeries to reduce maternal mortality and morbidity of patients. To elucidate this aim 150 Females in child bearing period who underwent normal vaginal delivery or cesarean section complicated by PPH included in the study.

The mean (\pm SD) age in years for the studied patients in this study was 30.8 ± 6.2 years, while that for **Hazra et al., (7)** was 30.25 ± 4.77 years and in the

study done by **Sheiner et al., (8)** showed a mean age of 28.4 ± 5.7 years.

In our study, the most common age group was between 20 to 30 years which agree with **Kramer et al., (9)** who found 80% of their studied cases were between 20 to 35 years.

In the present study, there were 117 patients were undergoing gynecological operation as cesarean in 107 patients (71.3%), ovarian cystectomy in 4 patients (2.6%), salpingectomy and cesarean in 2 patents (1.3%), that agree with **Green et al., (10)** who found that the main mode of birth in their cohort was caesarean section. One population-based case-control study in the UK by **Knight et al., (11)** showed that previous, and ongoing, caesarean deliveries are risk factors for peripartum hysterectomy (odds ratio 3.52, 95% CI 2.35– 5.26 and odds ratio 7.13, 95% CI 3.71–13.7,

respectively), and that the odds increased with the number of previous caesarean deliveries

In our study, there were 57 patients (38%) were undergoing only one operation, 54 patients (36%) were undergoing 2 operations, 26 patients (17.3%) were undergoing 3 operations while 13 patients (8.7%) were undergoing 4 operations which coincide with **Nawal Dayoub, (12)** who found that (8.6%) of PPH cases and (23%) of sever PPH cases had history of previous surgeries.

Also, in the study done by **Nyfløt et al., (2)** there were 19 (1.8%) had previous Uterine surgery and 126 (11.8%) had Previous cesarean

Previous cesarean delivery did explain a substantial fraction (37.6 %) of severe PPH, signaling the presence of placentation abnormalities. Incidence of placenta accreta was found to increase 2–30-fold according to number of previous cesarean deliveries **(13)**.

In the study done by **Ekin et al., (3)** Maternal age >35 years, body mass index >30, previous cesarean delivery and multiple gestation were associated with severe PPH. Increase in occurrence of severe PPH could be explained in partly by changes in rates of cesarean delivery, induction of labor or by increases in maternal age or body mass index. In addition, increased recognition or reporting PPH may also impact on the incidence of PPH.

In the current study, there were 12(8%) of the studied cases had abnormal placenta which agree with **Vandenbergh et al., (14)**, **Campbell et al., (15)** who found an increased risk with placenta previa and being pregnant with multiples, both well known risk factors in severe PPH and peripartum hysterectomy. Although antepartum hemorrhage is commonly caused by PP and placental abruption, placental abruption accounts for only a fraction of the cases of hemorrhage in pregnancy **(16)**. The association between PP and PAS and the risk of PPH is well documented and the need for transfusion usually indicates greater severity of hemorrhage **(17)**.

This is consistent with the findings of previous studies, which reported placenta accreta and uterine atony as the most common causes of hemorrhage leading to peripartum hysterectomy **(18)**.

Regarding to Rupture uterus, there were 9 (%6) of the studied cases had Rupture uterus which relatively near to **Kramer et al., (9)** who found that uterine trauma at delivery was in 2% of their studied cases and in the study done by **Nyfløt et al., (2)** there were 12 (1.1%) of their studied cases had Uterine rupture

In the current study, there were 9 (6%) had birth canal injury, 9 (6%) had retained tissue in our studied cases which near to the results in the study done by **Nyfløt et al., (2)** who found that 114 (10.7%) had birth canal trauma and 122 (11.4%) had

retained tissue from their studied cases. Retained placental tissue, including abnormal placentation, has been estimated to cause approximately 10% of all PPHs **(19)**.

Regarding to management, all the cases had fluid replacement, most of the cases had Uterotonic drugs and Uterine massage and no cases had intrauterine tamponade, balloon, that in agreement with the study by **Mousa and Alfirevic, (20)** showed uterotonics to be the most commonly used drugs by all maternity units. Although many units indicated that they may commonly use oxytocin, ergometrine and carboprost. **Ijaiya et al., (21)** did uterine massage and uterotonic therapy for 49.1% of PPH cases, bimanual compression of uterus in 3.5%. Repair of lower genital laceration was done in 19.8%, and repair of ruptured uterus in 2.9% of cases.

Regarding to DIC, there were 14 (9.3%) had DIC in our studied cases while in the study done by **Nyfløt et al., (2)** there were 18 (8%) had DIC and that near to our results.

In our study, there were 65(43.3%) had ICU admission which lower than the results in the study done by **Green et al., (22)** who found that 149 (82%) were admitted to level 3 intensive care. Also in the study done by **Shilei et al., (23)** there were 88.2% had ICU admission.

In our study, there was 9 (%6) had Hysterectomy, which near to the results in the study done by **Pettersen et al., (24)** who found 1.6% of women with severe PPHs required a hysterectomy. This rate was somewhat higher than the 2.7% rate observed among women with PPHs studied in the WOMAN trial, conducted in Europe and the Americas by **Huque et al., (25)**.

In this study, there were 18(12%) had uterine artery ligations, 9 (%6) had Internal iliac artery ligation and all of them had no compression sutures **(8)** showed that Uterine or internal iliac artery ligation was done in 0.9% of women with PPH in which exploration of birth canal was done, while 3.5% of those who needed packed RBCs transfusion had it done.

As regard to mortality, there were 6 (4%) had died which near to the results in the study done by **Green et al., (10)** who found that two women (1%) only died. Also, **Agten et al., (26)** who found that mortality from PPH decreased from 5.9% in 1993 to 3.5% in 2014.

In this study, there were 3 (2%) women had thromboembolic complication which near to the results in the study done by **Pettersen et al., (24)** who found 4 (9.5) of their studied cases had thrombotic complications.

Conclusion

The most common risk factors of PPH were uterine atony, placental abnormalities, history of previous cesarean sections and previous gynecological operations. Prediction of PPH can help in selection of subsequent delivery type and preparation and improvements in treatment, thus a decrease in the complications and make the necessary preparations before delivery.

References

1. Borovac-Pinheiro A, Pacagnella RC, Cecatti JG, Miller S, El Ayadi AM, et al. Postpartum hemorrhage: new insights for definition and diagnosis. *American journal of obstetrics and gynecology*, 2018; 219(2), 162-168.
2. Nyfløt, L., Sandven, I., Oldereid, N., Stray-Pedersen, B., Vangen, S.J. Assisted reproductive technology and severe postpartum haemorrhage: a case-control study. *International Journal of Obstetrics & Gynaecology*, 2017a ; 124, 1198-1205.
3. Ekin, A., Gezer, C., Solmaz, U., Taner, C. E., Dogan, A, Ozeren, M. Predictors of severity in primary postpartum hemorrhage. *Archives of gynecology and obstetrics*, 2015; 292, 1247-1254.
4. Shinohara S, Okuda Y, Hirata S, Suzuki K. Predictive factors for secondary postpartum hemorrhage: a case-control study in Japan. *The Journal of Maternal-Fetal & Neonatal Medicine*, 2020; 1-5.
5. Higgins N, Patel SK, Toledo P. Postpartum hemorrhage revisited: new challenges and solutions. *Current Opinion in Anesthesiology*, 2019; 32(3), 278-284.
6. Meher, S. How should we diagnose and assess the severity of pph in clinical trials? *Best practice research clinical obstetricsgynaecology*, 2019; 61, 41-54.
7. Hazra, S., Chilaka, V., Rajendran, S, Konje, J. Massive postpartum haemorrhage as a cause of maternal morbidity in a large tertiary hospital. *Journal of obstetrics gynaecology*, 2004; 24, 519-520.
8. Sheiner, E., Sarid, L., Levy, A., Seidman, D. S, Hallak, M. Obstetric risk factors and outcome of pregnancies complicated with early postpartum hemorrhage: a population-based study. *The journal of maternal-fetal neonatal medicine.*, 2005; 18, 149-154.
9. Kramer, M. S., Dahhou, M., Vallerand, D., Liston, R, Joseph, K. Risk factors for postpartum hemorrhage: can we explain the recent temporal increase? *Journal of obstetrics and gynaecology canada*, 2011; 33, 810-819.
10. Green L, Knight M, Seeney FM, Hopkinson C, Collins PW, et al. The epidemiology and outcomes of women with postpartum haemorrhage requiring massive transfusion with eight or more units of red cells: a national cross-sectional study. *BJOG: An International Journal of Obstetrics & Gynaecology*, 2016; 123(13), 2164-2170.
11. Knight, M., Kurinczuk, J. J., Spark ,P, Brocklehurst, P. Cesarean delivery and peripartum hysterectomy. *United kingdom obstetric surveillance system steering committee %j obstetrics gynecology*, 2008; 111, 97-105.
12. Nawal Dayoub, M. Identifying risk factors of severe primary post-partum hemorrhage. *Bahrain medical bulletin*, 2021; 43.
13. Silver, R. M., Landon, M. B., Rouse, D. J., Leveno, K. J., Spong, C. Y., Thom, E. A., et al. Maternal morbidity associated with multiple repeat cesarean deliveries. 2006; 107, 1226-1232.
14. Vandenberghe, G., Guisset, M., Janssens, I., Van Leeuw, V., Roelens, K., Hanssens, M., et al. A nationwide population-based cohort study of peripartum hysterectomy and arterial embolisation in belgium: results from the belgian obstetric surveillance system. *Bmj open*, 2017; 7, e016208.
15. Campbell, S. M., Corcoran, P., Manning, E., Greene, R. A. Peripartum hysterectomy incidence, risk factors and clinical characteristics in ireland. *European journal of obstetrics gynecology reproductive biology and endocrinology*, 2016; 207, 56-61.
16. Jauniaux, E., Alfirevic, Z., Bhide, A., Belfort, M., Burton, G., Collins, S., Dornan, S., Jurkovic, D., Kayem, G, Silver, R. Placenta praevia and placenta accreta: diagnosis and management: green-top guideline no. 27a. *Bjog: an international journal of obstetrics & gynaecology*, 2018; 126, e1-e48.
17. Higgins, M. F., Monteith, C., Foley, M, O'herlihy, C. Real increasing incidence of hysterectomy for placenta accreta following previous caesarean section. *European journal of obstetrics & gynecology and reproductive biology*, 2013; 171, 54-56.
18. Allam, i. S., goma, i. A., fathi, h. M, sukkar, g. F. M. Incidence of emergency peripartum hysterectomy in ain-shams university maternity hospital, egypt: a retrospective study. *Archives of gynecology and obstetrics*, 2014; 290, 891-896.
19. Kramer, M. S., Berg, C., Abenhaim, H., Dahhou, M., Rouleau, J., Mehrabadi, A., et al. Incidence, risk factors, and temporal trends in severe postpartum hemorrhage. *American journal of obstetrics and gynecology*, 2013; 209, 449. E1-449. E7.
20. Mousa, H. A, Alfirevic, Z. Major postpartum hemorrhage: survey of maternity units in the

- united kingdom. *Acta obstetrica et gynecologica scandinavica*, 2002; 81, 727-730.
21. Ijaiya, M., Aboyeji, A, Abubakar, D. Analysis of 348 consecutive cases of primary postpartum haemorrhage at a tertiary hospital in nigeria. *Journal of obstetrics gynaecology*, 2003; 23, 374-377.
22. Green, L., Knight, M., Seeney, F., Hopkinson, C., Collins, P. W., Collis, R., et al. The epidemiology and outcomes of women with postpartum haemorrhage requiring massive transfusion with eight or more units of red cells: a national cross-sectional study. *Bjog: an international journal of obstetrics gynaecology.*, 2016; 123, 2164-2170.
23. Shilei, B., Lizi, Z., Yulian, L., Yingyu, L., Lijun, H., Minshan, H., et al. The risk of postpartum hemorrhage following prior prelabor cesarean delivery stratified by abnormal placentation: a multicenter historical cohort study. *Frontiers in medicine*, 2021; 1719.
24. Pettersen, S., Falk, R. S., Vangen, S, Nyfløt, L. T. Peripartum hysterectomy due to severe postpartum hemorrhage: a hospital-based study. *Acta obstetrica et gynecologica scandinavica*, 2022.
25. Huque, S., Roberts, I., Fawole, B., Chaudhri, R., Arulkumaran, S, Shakur-Still, H. Risk factors for peripartum hysterectomy among women with postpartum haemorrhage: analysis of data from the woman trial. *Bmc pregnancy childbirth*, 2018;18,1-8.
26. Agten, A. K., Passweg, D., Von Orelli, S., Ringel, N., Tschudi, R. Tutschek, B. Temporal trends of postpartum haemorrhage in switzerland: a 22-year retrospective population-based cohort study. *Swiss medical weekly*, 2017.