RETROSPECTIVE 6 YEARS STUDY OF MATERNAL OUTCOME AFTER CAESAREAN HYSTERECTOMY IN SULAIMANI MATERNITY TEACHING HOSPITAL

Chro Najmaddin Fattah [a] and Shanyar Mohamed [b]

Submitted: 1/17/2018; Accepted: 21/10/2018; Published: 21/6/2019

ABSTRACT

Background

Caesarean hysterectomy is one of the surgical procedures that performed as a last choice for saving mothers life challenging all obstetricians about the exact management between saving life or saving the fertility with the available resources.

Objectives

This study was conducted to determine incidence, associated factors and maternal morbidity and mortality after cesarean hysterectomy.

Patients and Methods

It is a descriptive retrospective study conducted over 6 years from 2012 to 2017 included all caesarean (peripartum) hysterectomies performed in Sulaimani maternity teaching hospital beyond 24 week gestation. File records was used to determine the data regarding the research. We used "IBM SPSS Statistics version 20" for the analysis of the data.

Results

The prevalence of cesarean hysterectomy was 0.56/1000 total deliveries. The ages were between 35-40 years, risk factors of last pregnancy were obesity, grand multiparity, and previous C\S were found in 55%, 65%, and 65% respectively. For antepartum and intrapartum risk factor antepartum hemorrhage and postpartum hemorrhage represented 20% and 30% respectively. Most of their pervious pregnancies delivered by (C/S) and 20% had history of 3 previous C/S, and 25% their pregnancy was complicated by gestational diabetes mellitus. Regarding intraoperative management blood product, B- Lynch suture, internal iliac artery ligation, intrauterine balloon, and recombinant factor 7 used in almost all cases. In follow up cases for 1 year chronic pelvic pain was most frequent complaint in 20% and ovarian cyst was also found in about 25%.

Conclusion

Prevalence of cesarean hysterectomy incidence was 0.56/1000 total deliveries. The significant risk factors were obesity, grand multiparity, and history of previous C\S sections. Regarding maternal age is not far from the international age related to cesarean hysterectomy.

Keywords: *Caesarean hysterectomy, Postpartum hemorrhage, Antepartum hemorrhage, Placenta previa, lacenta accreta/increta, multiparity.*

---

[a] Department of Gynecology and Obstetrics, College of Medicine, University of Sulaimani, Kurdistan Region, Iraq.
[b] Kurdistan Board Medical Studies Candidate.
Correspondence : shnyar@yahoo.com

https://doi.org/10.17656/jsmc.10192

INTRODUCTION

Cesarean hysterectomy is always a life-saving procedure, which is done after all conservative treatment options fail. The cesarean hysterectomy frequency is between 0.04 to 0.23 %. Even in up to date obstetrical practice post-partum hemorrhage remain an important cause of significant maternal morbidity and maternal mortality over the world. According to the recent report of Confidential Enquiry into maternal and child health, the number of maternal death due to bleeding is increased [1]. Up until 1980 uterine atony and uterine injury like rupture were the major common frequent causes for cesarean hysterectomy [2]. After that placenta accreta arise as the most repeated indication [2, 3]. This is related to the increasing cesarean section (C\S) rate and to the more successful treatment of bleeding after uterine atony by prostaglandin's, embolization, and surgical procedures as use of B-Lynch suture or selective de-vascularization [4, 5].

There is no real increase in the number of rupture of the uterus but it is due to global increase in cesarean sections rate [6]. Besides the link between past histories of cesarean section with placenta accrete and uterine rupture, cesarean section itself elevates the risk of cesarean hysterectomy, even after exception of patients who are not qualified for vaginal delivery [7].

The most usual indications for this operation include: abnormal placental implantation, placenta previa, uterine injury like rupture and uterine atony [8]. Invasive placentation (placenta accreta, increta, or percreta) shares to the significant challenges at Caesarean section. Caesarean hysterectomy in such situation may result in massive obstetrical hemorrhage regardless of surgical skills [9]. Cesarean hysterectomy is commonly undertaken in situation with life-threatening obstetric hemorrhage and may therefore be considered as "near miss" event. The analysis of near-miss events has been dedicated to complement the confidential enquiries into maternal death. A near miss event possibly determine as a sever life-threatening obstetric complication necessitating urgent medical intervention so as prevent likely death of the mother. Study of these events enhances the information offered by confidential enquiries into maternal death in a different ways. The figure of patients who experience a near miss event is more than the figure of patients who die and hence such studies have greater power to investigate risk indicators and management and identify possible cause of prevention [10, 11]. The first succeeded operation was performed in 1876 [12].

The objectives of this study were to examine the prevalence, indications, predisposing factors, associated complications, morbidity, and mortality of emergency cesarean hysterectomies in a tertiary center in Sulaimani Maternity Teaching Hospital.

PATIENTS AND METHODS

Tthis study was a descriptive retrospective study, conducted at Sulaimani maternity teaching hospital in Kurdistan of Iraq from 2012 to 2017 which is well equipped with emergency theater attached to delivery suites and blood transfusion facilities through duration of six years. The total number of deliveries 109662 including 74143 vaginal deliveries, 35519 caesarean (emergency and elective) deliveries and 20 cesarean hysterectomies in Sulaimani maternity hospital recorded.

The patients files of all identified patients were reviewed and analyzed regarding the maternal age, parity, gestational age at time of delivery, detail of the index pregnancy, associated medical diseases with pregnancy, previous obstetrics history (mode of delivery), indication for cesarean hysterectomy and type of operation performed, duration of hospital stay, and neonatal outcomes.

Intraoperative complications were known as the injury to the major blood vessels, bladder, ureter and bowel. Other maternal complications such as maternal death and hemorrhagic, neurological, urological, infectious, respiratory, renal, thromboembolic complications were also recorded.

All pregnant women who did hysterectomy during the initial caesarean or during the 24 hours next to the delivery included from gestational age 24 week and above. We used "IBM SPSS Statistics version 20" for the analysis of the data. In addition, a P-value of (0.05) was considered as statistically significant, and a P-value of (<0.001) as statistically very highly significant.

Verbal concept (by phone call) was taken from all patients to use their details in this study and all data were managed with respect of patients' privacy.

Ethical agreement taken from maternal teaching hospital included the director and the scientific committee of the hospital.

RESULTS

During the period from 17/02/2012 to 17/02/2017, there were 35519 Cesarean sections and 47173 vaginal deliveries. There had been 20 cesarean hysterectomies (18 performed after cesarean sections and 2 performed after vaginal delivery) with a ratio of 32.3% for C\S and ratio of 0.056% for cesarean hysterectomy (prevalence of 0.56/1000).

Table 1 55% (11 cases) live in suburban areas and 45% (9 cases) live inside the city and the case with maternal death was from suburban group. The majority of our patients were between the ages of 35-40 years 60% (12 cases), 25% (5 cases) between 29-35 years old, 15% (3 cases) between 41-42 years old.

Table 2 shows highly significant statistical association between number of gravidity and maternal outcome, there was 5% (1 case) gravida 2, 5% (1 case) gravida 4, 50% (10 cases) gravida 5, 25% (5 cases) gravida 6, 5% (1 case) gravida 7, and 10% (2 cases) gravida 8.

Table 3 shows that risk factors like obesity, grand multiparity, and previous C\S were found in large proportion of the cases 55% (11 cases), 65% (13 cases), 65% (13 cases) respectively with significant p-value. Surprisingly previous history of postpartum hemorrhage (PPH) found only in 25% (5cases). Also large for date pregnancy found in 30%(6 cases). Antepartum hemorrhage was found in 45% (9 cases) with significant p-value. Placenta previa found in 45% (9 cases) with significant p-value. With increasing average of cesarean sections placenta accreta found in 30% (6cases) with significant p-value. Lastly placenta increta/percreta found in 5% (1 case) and absent in 95% (19 cases).

Table 4 shows antepartum hemorrhage (APH) and postpartum hemorrhage (PPH) frequently present in most of our cases measuring 20% and 30% respectively and following that the prolonged labour, and use of oxytocin was 25%, uterine damage (rupture) and adhesions (damage to the bowl and bladder) account to 15%, uterine atony and sign of infection account for 10%, and finally Covular uterus 5%.

Table 5 shows 20% had history of 3 previous C/S, with 15% 2-4 previous C/S,5 % 1-2 previous C/S, and 5% 5 previous C/S.

Table 6shows 25% had gestational diabetes mellitus (GDM), 15% hypertensive, 5% both, and 5% mitral valve prolapse and hypothyroidism.

Table 7 shows the steps of management during the surgical operation and its association with the maternal outcome which is highly significant.

Table 8 shows the association between the findings on 1 year follow up and the maternal outcome, 30% of cases cannot be contacted due to wrong or changing phone number. 20% doing well, chronic pelvic pain was the most frequent complain during the contact about 20%, ovarian cyst was also experienced by about 25%, 5% for chronic constipation and chronic back and abdominal pain.

Table 1. Association of maternal outcome with residency and maternal age.

Associations		Maternal outcome			P-value (Pearson Chi-Square test)
		Good outcome	Death	Total	
Maternal age groups (year)	29-34	5 (25%)	0 (0%)	5 (25%)	0.83
	35-40	11 (55%)	1 (5%)	12 (60%)	
	41-42	3 (15%)	0 (0%)	3 (15%)	
Residency	Urban (inside city)	9 (45%)	0 (0%)	9 (45%)	0.48
	Suburban (outside city)	10 (50%)	1 (5%)	11 (55%)	

Table 2. Association of number of gravida with the maternal outcome.

Number of gravida (G)	Maternal outcome		Total	P-value (Pearson Chi-Square test)
	Good outcome	Death		
2	1 (5%)	0 (0%)	1 (5%)	
4	1 (5%)	0 (0%)	1 (5%)	
5	10 (50%)	0 (0%)	10 (50%)	
6	4 (20%)	1 (5%)	5 (25%)	0.01
7	1 (5%)	0 (0%)	1 (5%)	
8	2 (10%)	0 (0%)	2 (10%)	
Total	19 (95%)	1 (5%)	20 (100%)	

Table 3 Associations between risk factors of the last pregnancy with maternal outcom.

Risk factors in last pregnancy		Maternal outcome		Total	P-value (Pearson Chi-Square test)
		Good outcome	Death		
Obesity	**Yes**	11 (55%)	0 (0%)	11 (55%)	0.36
	No	8 (40%)	1 (5%)	9 (45%)	
Grand multiparity	**Yes**	12 (60%)	1 (5%)	13 (65%)	0.299
	No	7 (35%)	0 (0%)	7 (35%)	
Previous C/S	**Yes**	12 (60%)	1 (5%)	13 (65%)	0.55
	No	7 (35%)	0 (0%)	7 (35%)	
Previous history of PPH	**Yes**	5 (25%)	0 (0%)	5 (25%)	0.69
	No	14 (70%)	1 (5%)	15 (75%)	
Large for date pregnancy	**Yes**	6 (30%)	0 (0%)	6 (30%)	0.621
	No	13 (65%)	1 (5%)	14 (70%)	
APH	**Yes**	9 (45%)	0 (0%)	9 (45%)	0.36
	No	10 (50%)	1 (5%)	11 (55%)	
Placenta previa	**Yes**	8 (40%)	1 (5%)	9 (45%)	0.257
	No	11 (55%)	0 (0%)	11 (55%)	
Placenta accrete	**Yes**	6 (30%)	0 (0%)	6 (30%)	0.246
	No	13 (65%)	1 (5%)	14 (70%)	
Placenta increta/percreta	**Yes**	1 (5%)	0 (0%)	1 (5%)	0.943
	No	18 (90%)	1 (5%)	19 (95%)	

APH = Antepartum hemorrhage; C/S = Cesarean section; PPH = Post-partum hemorrhage

Table 4. Association of patients' antepartum and intrapartum risk factors with the maternal outcome.

Antepartum and intrapartum risk factors	Maternal outcome		Total	P-value (Pearson Chi-Square test)
	Good outcome	Death		
1, 2	2 (10%)	0 (0%)	2 (10%)	
1, 2, 4, 5, 10	1 (5%)	0 (0%)	1 (5%)	
1, 2, 7	1 (5%)	0 (0%)	1 (5%)	
1, 5, 8, 9	1 (5%)	0 (0%)	1 (5%)	
2, 5, 8, 9	1 (5%)	0 (0%)	1 (5%)	
4	1 (5%)	0 (0%)	1 (5%)	
4, 6	1 (5%)	0 (0%)	1 (5%)	0.395
4, 7	1 (5%)	0 (0%)	1 (5%)	
5	3 (15%)	0 (0%)	3 (15%)	
5, 7	1 (5%)	0 (0%)	1 (5%)	
6	2 (10%)	0 (0%)	2 (10%)	
Nil	4 (20%)	1 (5%)	5 (25%)	
Total	19 (95%)	1 (5%)	20 (100%)	

1=Prolonged labor; 2=Use of oxytocin; 3= Instrumental delivery; 4=APH in labor (Intrapartum); 5=PPH; 6=Adhesion, damage to bladder and/or bowel; 7=Uterine damage or rupture; 8=Sign of infection; 9= Uterine atony; 10 = Covular

Table 5. Association of past surgical history with the maternal outcome

Past surgical history	Maternal outcome		Total	P-value (Pearson Chi-Square test)
	Good outcome	Death		
Nil	5 (25%)	0 (0%)	5 (25%)	
One C/S and Incisional hernia	1 (5%)	0 (0%)	1 (5%)	
Two C/S	3 (15%)	0 (0%)	3 (15%)	
Two C/S and Cholecystectomy	1 (5%)	0 (0%)	1 (5%)	
Three C/S	4 (20%)	0 (0%)	4 (20%)	0.086
Four C/S	3 (15%)	0 (0%)	3 (15%)	
Five C/S	0 (0%)	1 (5%)	1 (5%)	
D&C for missed abortion	1 (5%)	0 (0%)	1 (5%)	
Total	19 (95%)	1 (5%)	20 (100%)	

Table 6. Association of past medical history with the maternal outcome.

Past medical history	Maternal outcome		Total	P-value (Pearson Chi-Square test)
	Good outcome	Death		
Hypertension	3 (15%)	0 (0%)	3 (15%)	0.93
GDM	5 (25%)	0 (0%)	5 (25%)	
Hypertension + GDM	1 (5%)	0 (0%)	1 (5%)	
MVP	1 (5%)	0 (0%)	1 (5%)	
Hypothyroidism	1 (5%)	0 (0%)	1 (5%)	
Total	19 (95%)	1 (5%)	20 (100%)	

DGM = Gestational diabetes mellitus; MVP = Mitral valve prolapse

Table 7. Association of steps of management during operation with the maternal outcome.

Steps of management	Maternal outcome		Total	P-value (Pearson Chi-Square test)
	Good outcome	Death		
1, 2, 3, 4	1 (5%)	0 (0%)	1 (5%)	0.002
1, 2, 3, 4, 5	3 (15%)	0 (0%)	3 (15%)	
1, 2, 3, 4, 5, 6	1 (5%)	0 (0%)	1 (5%)	
1, 2, 3, 4, 5, 6, 7	1 (5%)	0 (0%)	1 (5%)	
1, 3, 4, 5	8 (40%)	0 (0%)	8 (40%)	
1, 3, 4, 5, 6, 7	2 (10%)	0 (0%)	2 (10%)	
1, 3, 4, 5, 8	1 (5%)	0 (0%)	1 (5%)	
1, 4	0 (0%)	1 (5%)	1 (5%)	
3, 4, 5	1 (5%)	0 (0%)	1 (5%)	
4, 5, 6	1 (5%)	0 (0%)	1 (5%)	
Total	19 (95%)	1 (5%)	20 (100%)	

1=B-Lynch; 2=Intra-uterine balloon therapy; 3=Bilateral internal artery ligation; 4=Received blood; 5=Received FFP; 6=Received platelet; 7=Received cryoprecipitate; 8=Factor 7 (Novoseven)

Table 8. Association between the maternal outcome and follow up findings after one year.

Follow up after one year	Maternal outcome		Total	P-value (Pearson Chi-Square test)
	Good outcome	Death		
1	0 (0%)	0 (0%)	1 (5%)	0.005
1, 2, 3	1 (5%)	0 (0%)	1 (5%)	
1, 6	1 (5%)	0 (0%)	1 (5%)	
1, 7	1 (5%)	0 (0%)	1 (5%)	
2	2 (10%)	0 (0%)	2 (10%)	
3	1 (5%)	0 (0%)	1 (5%)	
4	6 (30%)	0 (0%)	6 (30%)	
5	4 (20%)	0 (0%)	4 (20%)	
7	1 (5%)	0 (0%)	1 (5%)	
8	1 (5%)	0 (0%)	1 (5%)	
9	0 (0%)	1 (5%)	1 (5%)	
Total	19 (95%)	1 (5%)	20 (100%)	

1=Chronic pelvic pain; 2=Ovarian cyst; 3=Recurrent UTI; 4=Couldn't be contacted; 5=Doing well; 6=Chronic abdominal pain; 7=Chronic back pain; 8=Chronic constipation; 9=Died . UTI = Urinary tract infection

DISCUSSION

In this study the ratio of cesarean sections to total deliveries carried in this Tertiary center was 32.3% compared to the WHO standard of 10-15%[13]. The rate of cesarean sections is much higher, this is due to up going rate of elective cesarean sections because of maternal request. Internationally the rate is dramatically going up as it is shown by a study done in Switzerland showing that the cause of the increase of cesarean section was due to greater fear of scarifying the fetus and to avoid labour pain especially after previous 1 C\S [14].

The little number of cases in this series is attributed to the fact that Cesarean hysterectomy is not common procedure and can be only performed after all other method had failed. The most prospective studies carried on this subject included only few cases [15, 16, 17]. Although we collected cases during 6-year period but still we could have 20 cases. The little number of cases has an effect on the test to become statistically significant. We think what appear to be statistically insignificance may be really significant for individual cases.

The incidence of cesarean hysterectomy in this study was 0.56/1000 and when compared with internationally published studies, the difference in the incidence of cesarean hysterectomy following vaginal delivery and cesarean sections found to be 0.1-0.3/1000 vaginal birth [6,18] and 0.17-8.7/1000 cesarean sections and when comparing our data to the data from neighboring country like 0.36/1000 in Turkey [19], 1.39/1000 Iran [20], 1/1000 Kuwait [21], 0.47/1000 United Arabic Emirates [22], 0.5/1000 Saudi Arabia [23], 1.9/1000 India [20], and in the developed countries like United states of the America it was 1.2-2.7/1000 [24], 0.3/1000 Ireland [25], 0.24/1000 china [26], 0.8/1000 Canada [18], 0.33/1000 Netherland [6], and 0.2 /1000 Norway [6]. Our result is near to that of neighboring countries.

There were many obstacles during performing this study, one of them was the little number of the patients and the presence of only one dead among them, other issue was the poor filing system and difficulties in obtaining all requested information from every file. Our result was showing one maternal death with insufficient standard care and longer time to reach tertiary academic center. The majority of our patients were between the ages of 35-40 years, comparable with other studies the mean age was (34.04+-8.04) and (34.6+-4.7) [27].

The only maternal death was gravida 6 which confirm that the raise in the gravidity is linked with more cesarean hysterectomy and adverse maternal outcome compared to a research performed in Saudi Arabia which percolates the same finding [28]. If we take each risk factor separately we will find that obesity,

grand multiparity, and previous C\S were found in large proportion of the cases 55% (11 cases), 65% (13 cases), 65% (13 cases) respectively with significant p-value. Surprisingly previous history of postpartum hemorrhage (PPH) found only in 25% (5cases). Also large for date pregnancy found in 30%(6 cases). Antepartum hemorrhage was found in 45% (9 cases) with significant p-value. Placenta previa found in 45% (9 cases) with significant p-value. With increasing average of cesarean sections placenta accreta found in 30% (6cases) with significant p-value. And lastly Placenta increta/percreta found in 5% (1case) and absent in 95% (19 cases).

Although APH and PPH were the most frequently measure in our cases, in contrast to other study they found morbidly adherent placenta and APH regarding as the main causes for cesarean hysterectomy [6, 11, 28]. We had one maternal death, she had multiple risk factors which were grand multiparity, history of past C\S sections, placenta previa, and placenta accrete.

We noticed that obesity, grand multiparity, and history of previous C\S sections was major risk factors from last pregnancy and we also found interestedly uterine atony had no such effect on the cause of cesarean hysterectomy and neither on maternal outcome in our research despite the previous reports where uterine atony was the master cause [19, 29, 30]. In compare to other research which performed in neighboring countries like Turkey the major cause was sever bleeding due to uterine atony [19], in Saudi Arabia was bleeding from the lower segment of the uterus due to morbidly adherent placenta (placenta accrete) [28]. Moreover in developed countries like in United Kingdom's uterine atony and morbidly adherent placenta which lead to sever PPH bleeding [11], again in Netherland morbidly adherent placenta due to previous cesarean section was the main cause for cesarean hysterectomy [6].

We had one local study done in Sulaimani and Erbil maternity teaching hospitals show that the 1st cause of cesarean hysterectomy was morbidly adherent placenta and secondly was the uterine atony [31].

About past surgical history, we noticed that majority of ladies delivered most of their pervious pregnancies by cesarean section (C/S) and we noticed that 20% had history of 3 previous C/S, with 15% 2-4 previous C/S,5 % 1-2 previous C/S, and 5% 5 previous C/S and she is the only dead case from the Study. In another study done in Eastern Taiwan, also history of previous C/S lead to raise the chance of emergency cesarean hysterectomy [17].

About past medical history, 25% had gestational diabetes mellitus (GDM), 15% hypertensive, 5% both, and 5% mitral valve prolapse and hypothyroidism. In another study conducted on the adverse pregnancy outcome of gestational diabetes mellitus (GDM) show that GDM was risk factor for postpartum hemorrhage with P-value 0.12 [32], but 40% and 25% respectively had no any adverse past medical or past surgical history.

In relation to the steps of management during the surgical operation and its association with the maternal outcome which is highly significant. These measurements undertaken before the decision for the hysterectomy take place. We noticed that use of blood specially and blood product generally used in all patient as a general measure of conservative management and because of most of the patients were hemodynamically unstable, B-Lynch suture were tried nearly in all cases, bilateral internal iliac artery ligated done by vascular surgeon, intrauterine balloon therapy inserted, all kind of blood product used (whole blood, fresh frozen plasma, platelets, cryoprecipitate), and in one case recombinant factor 7 also used. When compared it with the other study using blood product was similar to them, but use of B-Lynch suture and internal iliac ligation are more tried in our study, while B-Lynch suture is not that popular in other studies [16, 27]. With the only dead case of the study, only blood products transfusions and B-Lynch suture were used.

When looking at the association between the findings on 1 year follow up and the maternal outcome, 30% of cases cannot be contacted due to wrong or changing phone number. 20% doing well, chronic pelvic pain was the most frequent complain during the contact about 20%, ovarian cyst was also experienced by about 25%, 5% for chronic constipation and chronic back and abdominal pain. We refer the causes of majority of these symptoms to the adhesion due to difficult complicated and longtime operation. Comparing these results to other studies they noticed that in the early complication including fever, blood transfusion, urinary tract infection, and paralytic ileus were most present and about the late complication presence of adhesions in subsequent surgical operation for other indications was the frequent problem [33].

In conclusions, performing cesarean hysterectomy as a last available choice for saving women life with rate of

0.056% in our tertiary hospital with incidence 0.56/1000 which is near to the incidence of the neighboring countries and it's higher than developed countries like Norway, Netherland, and Ireland. And the major risk factors were obesity, grand multiparity, and history of previous C\S sections. In relation to age is not far from the international age related to cesarean hysterectomy.

Recommendation

Risk factors for rupture uterus should be identified during booking and all visits in antenatal clinics and also attempt to raise the community awareness about the impact of obesity, and previous caesarean sections by enhancing more for vaginal birth, also the presence of available information for all women about contraception to increase knowledge about the risk associated with multiparity.

REFERENCES

1- Confidential Enquiry into Maternal and Child Health: why mothers die 2000-2002, London (UK): Royal College of Obstetricians and Gynecologist; 2004; 6: 80-93.

2- Zorlu CG, Turan C, Isik AZ, Danisman N, Mungan T, Gokmen O. Emergency hysterectomy in modern obstetric practice . Acta Obstet Gyneacol Scand 1998;77:186-90.

3- Kastner ES, Fiqueroa R, Garry D, Maulik D, emergency peripartum hysterectomy: experience at a community teaching hospital. Obstet Gyneacol. 2002; 99:971-5

4- B-Lynch C, Coker A, Lawal AH, Abu J, Cowen M. The B-Lynch surgical technique for the control of massive postpartum hemorrhage an alternative to hysterectomy? Five cases reported. BJOG. 1997; 104:372-5.

5- AbdRabbo SA. Stepwise uterine devascularization: a novel technique for management of uncontrollable postpartum hemorrhage with preservation of the uterus. Am J Obstet Gynecol. 1994; 171:694-700.

6- Kwee A, Michiel L, Visser GHA, Bruinse HW. Emergency peripartum hysterectomy: A prospective study in the Netherlands. European journal of obstetrics and gynecology. 2006; 124:187-192

7- Kacmar J, Bhimani L, Boyd M, Shah-Hosseini R, Peipert JF. Route of delivery as a risk factor for emergency peripartum hysterectomy: a case control study. Obstet Gynecol. 2003; 102:141-5

8- Jagielska I, Kazdepka-Ziemińska A, Tyloch M, Papierski M, Zołniezewicz K, Grabiec M, et al. [Clinical study of perinatal hysterectomy between 2000-2011 in the clinic of obstetrics, gynecological diseases and oncological gynecology in Bydgoszcz]. Ginekol Pol. 2014; 85 (3):192-6.

9- Amsalem H, Kingdom JC, Farine D, Allen L, Yinon Y, D'Souza DL, et al. Planned caesarean hysterectomy versus "conserving" caesarean section in patients with placenta accreta .J Obstet Gynaecol Can. 2011; 33 (10):1005-10.

10- Polat Dursun. Use of bulldog vascular clamps to reduce intraoperative bleeding during cesarean hysterectomy for placenta percreta. Int J Gynaecol Obstet. 2017; 21.

11- Knight M. National perinatal epidemiology unit. Peripartum hysterectomy in UK: management and outcome of the associated hemorrhage. International J of obstetrics and gynecology. 2007; 114:1380-1387.

12- Sturdee DW, Rushton DI. Cesarean and postpartum hysterectomy. J Obstet Gynaecol. 1983; 93: 270-274.

13- WHO statement of cesarean sections rates, HRP.2015:1;1-3.

14- Andre K, Irene H, Rahel T, Corinne U, Dorothy H, Brigitte L, et al. Maternal request: a reason for rising rates of cesarean sections? Archives of gynecology and obstetrics. 2012:286 (1):93-98

15- Masafumi K, Shingo U. Cesarean hysterectomy for Abnormal Placentation Using Balloon Occlusion of the Common Iliac Artery: Case Series. Woman health open J. 2017; 3(1): 15-20.

16- Sahin Z, Yusif U, Yaprak E, Guler S, Mansur K. Peripartum hysterectomy in teaching hospital in the eastern region of Turkey. European journal of obstetrics and gynecology. 2005; 120:57-62.

17- Ding DC, S. Hsu, Chu TW, Chu TY. Emergency peripartum hysterectomy in a teaching hospital in eastern Taiwan. The journal of obstetrics and gynecology. 2009:26; 635-638

18- Machado LSM. Emergency peripartum hysterectomy: Incidence, indications, risk factors and outcome . North American journal of medical science. 2011; 3(8): 358-361

19- Tapisiz O, Altinbas S, Yarci B, Cenksoy P, Kaya A, Dede S, et al. . Emergency peripartum hysterectomy in a tertiary hospital in Ankara, Turkey: a 5 years review. Arch gynecology obstetrics. 2012; 286 (5):1131-1134

20- Gurtani FM, Fedaei B, Akbari M. Emergency peripartum hysterectomy in Asfahan; maternal mortality and morbidity rates among the women who underwent peripartum hysterectomy. Advanced biochemical research. 2013; 2: 20-32.

21- Wane R, Abu-Hudra N, Al-Tahir S. Emergency peripartum hysterectomy: A 13 years review at a tertiary center in Kuwait. J obstetrics gynecology India. 2014; 64 (6): 403-408

22- Muna A, Mahera A, Nawal M, Mushtaq O, Fatima C, Shazia M , et al. Emergency peripartum hysterectomy in the Dubai health system: A 15 years experience. Turk J Obstet Gynecol. 2018; 15(1): 1-7.

23- Yamani ZT. Indication of emergency peripartum hysterectomy; review 17 cases. Arch gynecology obstetrics. 2003; 268(3): 131-135

24- Glaze S, Ekwalanga P, Roberts G, Lange I, Birch C, Posengarten A, et al. Peripartum hysterectomy 1999-2006. Obstetrics and gynecology. 2008; 111(3):732-738

25- Mohaparta I, Ranjan S, Pruthwiraj. Emergency peripartum hysterectomy: A 3 year experience at tertiary care center. Perspective in medical research. 2016: 4(1): 42-44.

26- Jin Rong, Guo Yuna Chen Yan. Risk factor associated with. Emergency peripartum hysterectomy. China Med L 2014; 127 (5):900-904.

27- Shamsa A, Harris A, Anpalagan A. Peripartum hysterectomy in a tertiary hospital in western Sydney. The journal of obstetrics and gynecology. 2015; 35: 350-353.

28- Begum M, Alsafi F, EIFarra J, Tamim H, Lie Tin. Emergency peripartum hysterectomy in in a tertiary hospital in Saudi Arabia. The Journal of Obstetrics and gynecology of India. 2014; 64(5): 321-327.

29- Clark SL, Yeh SY, Phelan JP, Bruce S, Paul RH. Emergency hysterectomy for obstetric hemorrhage. Obstetrics and gynecology.1984:64(3):376-380.

30- Bai SW, Lee HJ, Cho JS, Park KH. Peripartum hysterectomy and associated factors. Journal of reproductive medicine. 2003:48; 148-152

31- Soz M, Atia S. Emergency cesarean hysterectomy Incidence, Indication and maternal outcome Sulaimani and Erbil maternity teaching hospital. 2013;1:12-13.

32- Dittakarn B, Pattarawalai T, Prasert S, Ratre S. Adverse pregnancy outcome of in gestational diabetes mellitus. J Med Assoc Thai. 2006; 89:23-28

33- Molly W, Staff W. C-section now, hysterectomy Complication later? MedPage Today General OB/GYN.2017:8;45-50