

# Emergency peripartum hysterectomy in Isfahan; maternal mortality and morbidity rates among the women who underwent peripartum hysterectomy

Fatemeh Mostajeran Gurtani, Behrooz Fadaei<sup>1</sup>, Mojtaba Akbari<sup>1</sup>

Department of Obstetrics and Gynecology, <sup>1</sup>Medical Students' Research Center, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

## Abstract

**Background:** Peripartum hysterectomy is associated with significant morbidity and mortality. We determined the factors leading to and maternal mortality and morbidity rates among the women who underwent peripartum hysterectomy in Iran.

**Materials and Methods:** This case-series study was conducted from March 2004 to March 2009 in the Department of Gynecology and Obstetrics at two central university hospitals (Azahra hospital and Shahid Beheshti Hospital) in Isfahan. Forty one women among 29,444 deliveries underwent peripartum hysterectomy. Women who had delivery before 24 weeks and a hysterectomy for other reasons like sterilizations were excluded. Incidence, indications and maternal complications including maternal death and urological, infectious and wound complications were evaluated after operation.

**Results:** During the study period, the incidence of peripartum hysterectomy estimated about 1.39 per 1,000 deliveries. The maternal mortality rate was 17.07%. There was no statistical difference in mortality rates between referrals and non-referrals women ( $P = 0.6$ ). Post-operative complications included infection (22%), bladder injuries (7.3%), urine retention (4.8%) and wound dehiscence (4.87%). The main indication was placenta accreta 28 (68.3%).

**Conclusion:** This study indicated the high rate of mortality among patients underwent peripartum hysterectomy. Evaluation of management during referring the patients and designing more studies to evaluate the mortality and morbidities are warranted.

**Key Words:** Hysterectomy, maternal morbidity, maternal mortality, peripartum, placenta accreta

### Address for correspondence:

Dr. Behrooz Fadaei, #15, Abshar Apartment, 1<sup>st</sup> Abashar Street, Isfahan, Iran. E-mail: drbfadaei@yahoo.com

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## INTRODUCTION

Emergency peripartum hysterectomy is a life-saving surgical procedure, which is performed to control massive hemorrhage. The incidence rate has estimated about 1.5 per 1,000 deliveries in developed countries.<sup>[1-3]</sup> Cesarean delivery is the major risk factor for peripartum hysterectomy and due to recently raising cesarean delivery rate and the increasing population with a scarred uterus, the incidence of emergency peripartum hysterectomy may indirectly

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increase. Historically, the most common indication cited for peripartum hysterectomy was uterine atony<sup>[4-9]</sup> but, more recent reports have suggested that abnormal placentation, including placenta accreta, has become the most common indication for peripartum hysterectomy.<sup>[10,11]</sup>

Peripartum hysterectomy is associated with significant morbidity and mortality. The main complications related to emergency peripartum hysterectomy include transfusions,<sup>[12-14]</sup> disseminated intravascular coagulation, infection and potential injury to the adjacent lower urinary tract,<sup>[15,16]</sup> and even maternal death.<sup>[6,17]</sup> Maternal mortality rates reported from 1% to 6%<sup>[6,9]</sup> but, some studies in regions with limited medical and hospital resources indicated that this rate is as high as 30%.<sup>[18]</sup> Although, many studies estimated the rate of peripartum hysterectomy, the majority of them are retrospective studies. In addition, some studies showed that almost all maternal mortalities were in patients whom referred to the central hospitals<sup>[1]</sup> and it is necessary to estimate the management was occurred before receiving the patients in central hospitals. Therefore, we conducted a study to determine factors that may lead to maternal mortality/morbidity among the women who underwent peripartum hysterectomy with the focus on referral or non-referral patient status.

## MATERIALS AND METHODS

This case-series study was conducted from March 2004 to March 2009 in the Department of Gynecology and Obstetrics at two central university hospitals (Azahra hospital and Shahid Beheshti Hospital), and the Ethics Committee of Isfahan University of Medical Sciences approved the study protocol. The study was registered at ClinicalTrials.gov (Identifier: NCT01285258).

Forty one patients, after registering demographic data and obstetric properties such as age, type of admission (referral or non-referral), parity, gravidity, gestational age, previous cesarean delivery, mode of delivery, the indications and type of hysterectomy were included in the study. Women who had delivery before 24 weeks and a hysterectomy for other reasons like sterilizations were excluded. Both, medical and surgical modalities were used to control the hemorrhage before hysterectomy. All patients received information on the purpose of the study and complications of surgery and signed a consent form and in the emergency situations the information explained to the persons who were responsible for patients.

Numbers of blood transfusion units, the pathology

reports and maternal complications, including maternal death and urological, infectious and wound complications were evaluated after operation. Blood transfusions were the number of unit of fresh frozen plasma and whole blood cell given during hospitalizations. The hysterectomy was performed shortly (within hours) after delivery.

All the patients received prophylactic antibiotics comprising ampicillin, gentamicin and metronidazole peri-operatively. Febrile morbidity was defined as a temperature of 38°C or more on any two consecutive days after surgery but excluding the first day.

All statistical analysis was done using the SPSS v.16. A Chi-squared test was used to compare the mortality rate between referral and non-referral patient's hysterectomy outcomes. Frequencies and percentages were given as descriptive statistics. Alpha was set at 0.05 for the statistical significance level.

## RESULTS

Between 2004 and 2009, there were a total of 29,444 deliveries in two central university hospitals. Forty one emergency hysterectomies were performed with identified rate of 1.39 per 1,000 deliveries during the study period. Maternal characteristics are shown in Table 1. Thirteen (31.7%) of the patients were referred from other centers due to postpartum hemorrhage [Table 2]. There were 4 (9.8%) nulliparous and 37 (90.2%) multiparous women. There were 10 (76.9%) and 25 (89.2%) cesarean sections among the referrals and non-referrals groups. The most common indication for cesarean section was repeat cesarean [Table 2].

There were seven deaths (3 in referrals vs. 4 in non-referrals) with the total mortality rate of 17.07%. There was no statistical difference in mortality rates between referrals and non-referrals women ( $P = 0.6$ ). All patients received blood transfusions, with the median number of units of blood transfused being  $6.8 \pm 3.3$  (2-16) units.

The post-operative conditions and maternal outcomes are shown in Table 3. There were three (7.3%) cases of intraoperative bladder injury. Two of these patients had previously three cesarean sections and the present pregnancy was complicated with placenta previa. The other one had two previous cesarean sections. Post-operative complications occurred in 16 patients for a rate of 39%.

Indications for peripartum hysterectomy are shown in Table 4. The most common indication for hysterectomy was placenta accreta with or without previa (28 patients, 68.3%), followed by uterine

**Table 1: Maternal characteristics**

Characteristic	n=41
Age (years, mean±SD, range)	32.4±5.5 (20-45)
Gravidity (median, range)	3 (1-7)
Parity (median, range)	2 (0-4)
Gestational age (weeks, mean±SD, range)	35.1±2.6 (30-40)
Previous cesarean n (%)	27 (65.9)

**Table 2: Referrals and non-referrals characteristics and outcomes**

Characteristics	Referral (n=13)	Non-referral (n=28)	P value
Age (years, mean±SD)	30.6±5.3	33.2±5.5	0.17
Gravidity (median, range)	3 (1-5)	3 (1-7)	0.65
Parity (median, range)	2 (0-4)	2 (0-4)	0.3
Gestational age (weeks, mean±SD)	36±1.9	34±2.7	0.09
Previous cesarean n (%)	6 (46.2)	21 (75)	0.7
Death n (%)	3 (23.1)	4 (14.8)	0.6
Blood transfusion unit (mean, range)	7 (2-16)	7 (2-12)	0.6

**Table 3: Characteristic: Operative complications, post-operative conditions and maternal outcomes of the patients who underwent hysterectomy**

Characteristic*	n=41
Bladder injury (n, %)	3 (7.3)
Infection (n, %)	9 (22)
Wound dehiscence (n, %)	2 (4.8)
Urine retention (n, %)	2 (4.8)
Maternal mortality (n, %)	7 (17)
Total blood transfusion units (mean±SD, range)	6.8±3.3 (2-16)

\*Some patients had more than one complication

**Table 4: Indications for peripartum hysterectomy**

Indication n (%)	n=41
Placenta accreta	28 (68.3)
Uterine atony	7 (17.1)
Placenta previa	4 (9.8)
Uterine rupture	2 (4.8)

atony (7 patients, 17.1%). The mean birth weight was 2740 ± 952 g.

## DISCUSSION

Peripartum hysterectomy, a surgical procedure performed at the time of delivery or in the immediate postpartum period, although a rare event, is associated with increased morbidity and mortality. This study showed the total rate of maternal mortality about 17% in patients whom underwent peripartum hysterectomy. This rate is extremely higher compared to the 0% and 4.5% reported in other studies in developed countries<sup>[19,20]</sup> and is near to the rate of mortality in under developing countries with limited medical and hospital resources, respectively.<sup>[21,22]</sup> It

may due to our patients were selected from two central university hospitals, which contain complicated cases and this may influence the outcomes. Other reasons might be that many previous studies designed as retrospective and was not multicentric. Also, we should not ignore the effect of higher medical and hospital resources in developed counties in reaching these rates. As our knowledge, there is the first study to evaluate the mortality rate in peripartum hysterectomy in Iran and more studies are warranted.

Although, the mortality rate in referral patients (23%) was not significantly different with non-referral patients, but this high rate can be the result of weak management of patients before reaching the central hospital but maybe the small size of our sample makes the none significant different. Our results agreed with Forna and colleagues findings, which showed almost all maternal mortalities were in patients whom referred to the central hospitals.<sup>[1]</sup>

The most common indication for hysterectomy was placenta accreta with or without previa followed by uterine atony. Our findings were agreed with many studies.<sup>[23,24]</sup> However, our results were different with the findings from Nasrat and colleagues<sup>[25]</sup> which showed atonic postpartum haemorrhage followed by ruptured uterus were the most common indications. The increased prevalence of cesarean delivery and the introduction of pharmacologic agents to prevent uterine atony may explain why recent studies are showing that abnormal placentation is replacing uterine atony as the most frequent indication for emergency postpartum hysterectomy.<sup>[26-28]</sup>

In our study, the post-operative complication rate was estimated about 39%, which is in regard to Karayalcin and colleagues findings, which showed 31.5% complications patients whom underwent peripartum hysterectomy.<sup>[29]</sup> There was a high prevalence of infectious morbidity in our study. It considered, we should study in detail our choice of antibiotics with the view to altering from combination of Gentamicin and Clindamycin to more powerful ones.

The rate of peripartum hysterectomy was estimated about 1.39 per 1,000 deliveries during our study period. Many studies have estimated an incidence rate in the US between 0.8 and 1.5 per 1,000 deliveries.<sup>[1-3]</sup> However, the incidence has been reported to be as high as 2.28 per 1,000 deliveries in other studies.<sup>[30]</sup> This variation is due in part to the different definitions regarding the time period for peripartum hysterectomy used in different studies, either within 24 h of a delivery<sup>[30]</sup> or during the same hospitalization period.<sup>[1,2]</sup>

## CONCLUSIONS

This study indicated the high rate of mortality among patients underwent peripartum hysterectomy. Evaluation of management during referring the patients and designing the more study to evaluate the mortality and morbidities are warranted.

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