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Postpartum Hysterectomy Indications of a Tertiary Referral Center

Tersiyer Bir Referans Hastanesinin Postpartum Histerektomi Endikasyonları

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ABSTRACT

Objective: Aim of the study is to determine the incidence, indications, risk factors, results of pathological investigations and outcomes of peripartum hysterectomies in a tertiary referral center. **Material and Methods:** We conducted a retospective review of 125 postpartum hysterectomy cases between 2009 and 2013. Hysterectomy Indications, way of delivery, demographic data of patients, complications and results of pathologic eveluation were studied. Statistical analyses for vaginal delivery and caesarean section was performed. **Results:** The frequency of total postpartum hysterectomy was found 1,19 in one thousands live birth during the study period. This rate was found 3 and 0.13 for caesarean section and vaginal birth respectively. The frequency of postpartum hysterectomy of patients who have gone to caesarean section while vaginal birth was being planned, was found 0.04 (5/104256) in all one thousands live birth. The indications for hysterectomy was uterine atony (17.6%), placenta previa (20.8%), placenta accreta (8.8%), placenta percreta (36.8%), placenta increta (12%) and uterine rupture (4%). Placenta invasion anomalies and uterine rupture were found significantly more frequent in caesarean section than vaginal birth ($p<0.001$). **Conclusion:** Emergency postpartum hysterectomy remains a life-saving surgical intervention. Clinicians should be alert for postpartum bleeding especially with previous caesarean sections.

Keywords: Postpartum hysterectomy; atony; placenta percreta; caesarean section

ÖZET

Amaç: Çalışmanın amacı, tersiyer bir referans hastanesinde gerçekleştirilen postpartum histerektomilerin, insidans, endikasyon, risk faktörleri ve patolojik inceleme sonuçlarının değerlendirilmesidir. **Gereç ve Yöntemler:** Çalışmada, 2009 ve 2013 yılları arasında yapılan 125 postpartum histerektomi vakası retrospektif olarak değerlendirilmiştir. Histerektomi endikasyonları, doğum şekli, hastaların demografik özellikleri, komplikasyonlar ve patolojik değerlendirme sonuçları incelenmiştir. **Bulgular:** Çalışma süresince total postpartum histerektomi sıklığı bin canlı doğumda 1.19 olarak saptanmıştır. Bu oran sezeryan doğum ve vajinal doğum için sırasıyla 3 ve 0,13 olarak bulunmuştur. Normal doğum planlanırken sezeryana giden ve postpartum histerektomi uygulanan hastaların tüm canlı doğumlara oranı bin canlı doğumda 0,04 (5/104256) olarak saptanmıştır. Sezeryan ve vajinal doğum sonrası total histerektomi endikasyonları, atoni (%17.6), plasenta previa (%20.8), plasenta akreata (%8.8), plasenta perkreata (%36.8), plasenta inkreata (%12) ve uterin rüptür (%4) olarak saptandı. Plasental invazyon anomalileri ve rüptür, sezeryan doğumda vajinal yolla doğuma kıyasla anlamlı olarak daha fazla saptandı ($p<0.001$). **Sonuç:** Acil postpartum histerektomi hayati önemi olan bir cerrahi işlemdir. Klinisyenler özellikle geçirilmiş sezeryanı olan hastaların postpartum kanamalarında dikkatli olmalıdır.

Anahtar Kelimeler: Postpartum histerektomi; atoni; plasenta perkreata; sezeryan

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Peripartum mortality is a major health problem for developing countries especially in rural areas and poorer communities and 99% of maternal mortality appears in these parts of the world.[1] Although skilled care policy and preventive measures, 830 women die every day because of problems related to pregnancy.[2] According to World Health Organisation (WHO), most of the complications related to childbirth are preventable or treatable. The major causes of all maternal deaths include severe bleeding, infections, abortion complications and hypertensive disorders.[1]

Postpartum haemorrhage is one of the most common medical cause of maternal mortality with a frequency of 1 in 100000 deliveries in developed countries while it increases to 1 in 1000 deliveries in developing countries which is associated with less opportunities to reach intensive care units, blood products and advanced surgical management.[3]

Peripartum hysterectomy (PPH) is a surgical venture which performed after vaginal delivery or caesarean birth because of severe, life-threatening bleeding which is not responding to medical and surgical conservative measures.[3] The incidence of peripartum hysterectomy varies between 0.24 to 8.9 per 1000 deliveries while the incidence is also associated with the way of birth and existence of risk factors.[4-8] Different underlying etiologic conditions can be found resulting in this vital operation including atony, uterine rupture and placental invasion anomalies such as placenta previa, accreta, increata and percreta. While the most common reason was uterine atony in the past, placenta accreta became more frequent reason due to the increase in the number of caesarean operation.[5,9-12]

In this study, we aimed to review emergency peripartum hysterectomies performed in our clinic for 8-year period.

MATERIAL AND METHODS

We conducted a retrospective analysis of obstetric patient files of caesarean hysterectomy and hysterectomy performed within 24 h of vaginal delivery between 2009 and 2013 The study was performed in a tertiary referral center in Turkey by using retrospective records of peripartum hysterectomies. Institutional Review Board has approved the study protocol (29.05.2017*6). Emergency peripartum hysterectomy was defined as hysterectomy which was performed in case of life-threatening bleeding within 24 h of delivery and does not respond to medical and surgical attempts.

All the data such as age, gravidity, parity, gestational age, birth weight, mode of delivery, previous surgery, preoperative diagnosis, final diagnosis, additional procedures performed during the surgery, complications (fever, thrombosis, bladder-intestinal injury or infection) blood transfusion need, replacement of fibrinogen and hospitalization time were obtained from patient records.

SPSS (Statistical Package for the Social Sciences) version 23.0 was used for statistical calculations. Data are presented with the number of patients and percentage and defined by mean±standard deviation and median (minimum-maximum). Numbers and percentages were used as descriptive statistical methods in evaluating the data. The relationship between the group variables were analyzed by chi-square analysis, and t-test was performed to determine whether the two groups' variable differed according to the continuous variable. The findings were assessed at the 5% significance level in the 95% confidence interval.

RESULTS

During the 4-year study period there were 104256 deliveries including 65682 (63%) vaginal deliveries and 38574 (37%) caesarean deliveries in our department. 125 peripartum hysterectomies (with a rate of 1,19 per 1000 live birth) were performed. Emergency peripartum hysterectomy was performed more frequent for the patients with previous caesarean section than first delivery and previous vaginal delivery (82,4%, 5,6% and 12% respectively). The rate of postpartum hysterectomy was significantly higher in caesarean section when compared with vaginal birth ($p<0.001$). Postpartum hysterectomy rate among vaginal delivery was 0.013%, while the rate was 0.3% for caesarean section ($p<0.001$). There was no significant difference in terms of age, gravidity, parity, birth weight, gestational week and complications among vaginal birth and caesarean section (Table 1). The in-

TABLE 1: Demographic details, hystopathologic results and complications of postpartum hysterectomy cases.

Variables	Vaginal delivery (n=9)	Caesarean section (n=116)	P value
Age (y) Median±SD	31.60±5.8	32.62±5.01	0.540
Gravidity Median (Min-Max)	4 (1-6)	4 (1-14)	0.473
Parity Median (Min-Max)	3 (1-4)	2 (1-13)	0.320
Abortus Median (Min-Max)	1 (1-2)	1 (0-12)	0.663
Gestational week Median(Min-Max)	38 (19-40)	35 (19-42)	0.129
Birth weight Median±SD	3280 (275±3820)	2685 (375±4390)	0.227
Histopathology n (%)			<0.001*
Normal	6 (60%)	20 (17.4%)	
Leiomyoma	3 (40%)	3 (2.6%)	
Placenta previa	0	22 (18.9%)	
Placenta accreta	0	10 (8.7%)	
Placenta increta	0	12 (10.4%)	
Placenta percreta	0	49 (42%)	
Transfusion need n (%)	9 (100%)	108 (93.1%)	1
Bladder injury n (%)	1 (11%)	10 (8,6%)	1

*P<0.005 is significant.

dications for hysterectomy was uterine atony (17.6%), placenta previa (20.8%), placenta accreata (8.8%), placenta percreta (36.8%), placenta increta (12%) and uterine rupture (4 %) (Table 1). Indications for caesarean section were fetal distress, cephalopelvic disproportion (CPD), malpresentation, previous uterine surgery, uterine rupture, placenta invasion anomalies, multiple pregnancy (1.7%, 2.6%, 1.7%, 87.9%, 2.6%, 2.6% and 0.9% respectively). Placenta invasion anomalies and uterine rupture were found significantly more frequent in caesarean section than vaginal birth (p<0.001), while atony is significantly more frequent in vaginal birth (p<0.001) (Table 2). The frequency of postpartum hysterectomy of patients who have gone to caesarean section while vaginal birth was being planned, was found 0.04 (5/104256) in all one thousands live birth. Indications for caesarean section were fetal distress (2), cephalopelvic disproportion (CPD) (3), malpresentation (2), multiple pregnancy (1) and doubt of placenta invasion anomaly (5) for these patients. The hysterectomy after previous caesarean section was significantly higher than vaginal birth and first caesarean section (82.4% vs 17.6) (p<0.001). Placenta invasion anomalies were higher with a history of caesarean section (94/98=96%) (p<0.001) than without previous uterine surgery (4/98=4%). All hysterectomies were total hysterectomy and there was no maternal mortality. Complications were thromboemboli (1/125=0,8%), fever (11/125=8.8%), wound infection (1/125=0.8%), bladder injury (11/125=8.8%). Histopathology of hysterectomy materials is detected as placenta invasion anomaly in caesarean section significantly more than vaginal delivery (80% in caesarean section, 22.2 % in vaginal delivery, (p<0.001)) (Table 2).

TABLE 2: Postpartum hysterectomy indications.

Variables n (%)	Vaginal delivery (n=9)	Caesarean section (n=116)	P value
Placental Invasion Anomalies	2 (22.2%)	96 (82.7%)	<0.001*
Atony	7 (77.7%)	15 (12.9%)	<0.001*
Rupture	0	5 (4.3%)	<0.001*

*P<0.005 is significant.

DISCUSSION

PPH is an emergency major surgery performed in case of life threatening haemorrhage to ensure stability of vital signs.[4] It is a dramatical surgery which the operator is forced to perform when conservative methods and medical interventions failed. PPH can be performed after both vaginal and caesarean delivery. Frequency of PPH varies around the world (ranges between 0.24/1000 and 8.9/1000 in live births).[13] In our study, total incidence is found to be 1.19/1000 which is consistent with the incidence of European countries.[13] In our study, Postpartum hysterectomy rate among vaginal delivery was 0.013%, while the rate was 0.3% for caesarean section ($p<0.001$). In our study, 103 patients had a history of previous section, while 13 patients had caesarean section due to other indications (three for fetal distress, two for CPD, two for malpresentation, one for multiple pregnancy, five for the doubt of placenta invasion anomaly which resulted in three leiomyoma and two placenta invasion anomaly after histopathologic evaluation). The hysterectomy after previous caesarean section was significantly higher than vaginal birth and first caesarean section (82.4% vs 17.6) ($p<0.001$). Similarly, a study from Iran has demonstrated that postpartum hysterectomy increses with previous caesarean section history.[14] Placenta invasion anomalies were higher with a history of caesarean section (94/98=96%) than without previous uterine surgery (4/98=4%) ($p<0.001$). The incidence has also variations in different regions of Turkey (ranging between 0.25 and 5.3/1000 live birth).[15] Our hospital is a tertiary referral center that high risk patients were consulted from the cities located nearby, therefore incidence might be detected higher.

The incidence of PPH seems to be higher following caesarean delivery according to literature (0.1 to 0.3/1000 live birth for vaginal birth and 0.17 to 8.7/1000 live birth for caesarean birth).[5] Similarly, we found that PPH is more frequent after caesarean birth (92,8% of all hysterectomies was after caesarean section) ($p<0.001$). Postpartum hysterectomy rate among vaginal delivery was 0.013%, while the rate was 0.3 % for caesarean section ($p<0.001$). Placenta invasion anomalies and uterine rupture were found significantly more frequent in caesarean section than vaginal birth ($p<0.001$), while atony is significantly more frequent in vaginal birth ($p<0.001$) (Table 2). This consequence is attributed to the increased risk of abnormal placentation with previous caesarean delivery.[4,9]

Life threatening postpartum haemorrhage can be detected due to uterine atony, retained placenta, coagulopathies, macrosomic fetus, multiparity, prolonged or precipitated labor and history of bleeding during the last labor and placenta invasion anomalies.[4-7,10,11,16] Although, uterine atony was the main reason of PPH in the past, abnormal placentation became the most common indication during the last decade due to the increasing tendency for caesarean section.[10,12] In our study, the indications for hysterectomy was uterine atony (17.6%), placenta previa (20.8%), placenta accreata (8.8%), placenta percreta (36.8%), placenta increta (12%) and uterine rupture (4 %).

In our study, atony is found to be 17.6% of the cases while 78.4% of the indications was abnormal placentation including placenta increata, accreta, percreta and previa. Distribution of pathologic assessment according to the birth way is showed in Table 1 and 2. Placental invasion anomalies and rupture was significantly higher in caesarean section, while atony was significantly higher in vaginal birth ($p<0.01$) (Table 2). The study of Clark et al. demonstrated that atony was the most common indication of PPH in 1984.[17] Stanco et al. introduced the new frequencies just eight years later in countenance of placenta accreta with a rate of 45%.[16] In recent years, placenta invasion anomalies became more common due to high rate of previous caesarean delivery.[5,18-20] The findings of previous study of Karayalcın et al. performed in our clinic between 2003 and 2008 showed that 42.4% of cases placenta previa and accreta while atony consists of 35.6% of hysterectomies.[6] Overall caesarean rate was 14.2% between 2003 and 2008 while increased to 21.2% in 2013. This unpreventable increase probably resulted in a major shift between indications from atony to placenta anomalies. According to the data of Turkish Population and Health Survey, general caesarean rate was 13.2% in 1998, 21.2% in 2003, 36.7% in 2008 and 48% in 2013.[9] Turkish Ministry of Health pre-

pared an action plan to prevent inevitable increase of caesarean rate which was found to be the highest one in Organisation for Economic Co-operation and Development (OECD) countries in 2015.[9] The incidence of caesarean tends to decline with the implementation of Robson classification.[9] Five patients were planned to have vaginal delivery, however, needed to perform emergency caesarean section. The frequency of postpartum hysterectomy within emergent caesarean cases, was not be able to examined due to the lack of appropriate patient records. This is a weak point of our study.

Increasing incidence of PPH due to abnormal placentation is considered to be related to high incidence of caesarean.[21] Kwee et al. showed that the incidence of placenta previa increases with the number of previous caesarean (1.9/1000 live birth for the first and increases to 91/1000 live birth for the fourth section).[5] In our study, 103 patients (103/125=82.4%) had previous caesarean section, and %96 of the placental abnormalities was observed in patients with previous caesarean birth (94/98). Although Risk factors such as high parity, recurrent caesarean sections, curettage and co-occurrence with placenta previa should be kept in mind for the possibility of PPH due to abnormal adherent placenta.[8]

Uterine atony was historically the most common reason of PPH and the incidence varies between 20.6% and 43%.[13] In our study, atony was found the third common reason with an incidence of 17.6%. Advancing use of new pharmacological agents used for atony is resulted in marked decrease for the need of PPH in recent years. Patients with risk factors such as multiparity, induction of labor, macrosomic fetus, prolonged or precipitated labor and twins need to be evaluated regarding uterine atony.[22]

Uterine rupture is determined in 4% of the patients for our study, while the incidence was showed ranging between 11.4% and 45.5% in literature.[13] All the rupture cases were in caesarean section ($p<0.001$).

In recent study, total hysterectomies were performed for all the cases. Subtotal hysterectomy was reported to be associated with shorter operating time, less blood transfusion need-less blood loss, and reduced incidence of operative-postoperative complications.[23] Abundant bleeding from low uterine segment, need of ligating cervical part of uterine artery, low placed placental invasion anomalies and to prevent bleeding from stump, total hysterectomy is more frequently used, although hemodynamic condition of the patient is the main factor for decision making on total or subtotal hysterectomy choices.[9]

The maternal mortality ranges between 0% to 31.5%. We did not experience mortality in this study period due to peripartum haemorrhage. Our complications were thromboemboli (1/125=0.8%), febrile episodes (11/125=8.8%), bladder injury (11/125=8.8%) and wound infection (1/125=0.8%). The distribution of operative complications was not significantly different between vaginal birth and caesarean section (Table 1). We needed blood transfusion more than 2 units for 117 patients, and fibrinogen replacement for 40 patients.

CONCLUSION

Although some risk factors can be predictive for postpartum haemorrhage, it is not possible to designate all the cases. A delay to perform hysterectomy leads to mortality therefore clinician should not hesitate to perform PPH if conservative attempts failed or not possible to apply.

In our study, the most common indication for PPH (78.4%) was placenta invasion anomalies majority of these cases was due to previous C-section. Clinicians should be attentive for placenta invasion anomalies for the patients with a history of previous surgery.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

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