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Clinical analysis of 52 obstetric hysterectomies

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ABSTRACT

Objectives: Analysis of obstetric (peripartum and postpartum) hysterectomies with regard to their frequency, indications, complications, and risk factors.

Material and methods: The study included 52 women operated between 1985–2012. Obstetric hysterectomies were performed in 39 (75%) and 13 (25%) women, respectively. The results were statistically analyzed as arithmetic mean and standard deviation (SD).

Results: Peri- and postpartum hysterectomies accounted for 0.123% of all births (0.092% and 0.031%, respectively). Mean patient age, length of pregnancy, and number of deliveries was 32.6 years [SD ± 6.2], 38.1 weeks [SD ± 7.0], and 3.2 [SD ± 2.4], respectively. In the study group, 92.31% of the women were multiparous, and 86.54% gave birth by cesarean section and had a history of CS. Placental pathology accounted for 44.4% of indications for hysterectomy. Blood transfusion was required in 94.2% of the cases, symptoms of hypovolemic shock were observed in 21.2%, and ICU admission was required in 15.4% of the patients. Relaparotomy was necessary in 4 (7.7%) cases. Intrauterine fetal death occurred in 4 (7.6%) cases and extremely poor neonatal status was observed in 4.1% of the newborns.

Conclusions: Hemorrhage due to placental pathology was the most frequent indication for obstetric hysterectomy. Risk factors for obstetric hysterectomy included multiparity, history of CS, recent CS, and age > 35 years. Postpartum hysterectomy accounted for 25% of the obstetric surgeries.

Key words: peripartum hysterectomy, hysterectomy in the postpartum period, labor

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INTRODUCTION

Hysterectomy, including postpartum hysterectomy, may be necessary if conservative management — pharmacological or surgical — proved unsuccessful and generated undesirable effects. Surgical techniques which block off the blood supply to the uterine body may be applied before a patient is deemed eligible for hysterectomy, especially in young women who wish to preserve their fertility. However, it seems prudent to exclude conservative procedures in the event of profuse bleeding [1, 2].

Hysterectomy may be considered as 'the lesser evil', signifying a choice between preservation of fertility and health or life of the affected woman. Peripartum hysterectomy (PH) has been defined in different ways. Bodelon et al., quote various authors and their definitions, from '24 hours after birth' to the 'entire period of postpartum hospitalization' [3]. The literature offers definitions ranging from 'until 72 hours postpartum' to '3-6 weeks after birth' [4–6]. Inclusion of obstetric hysterectomy into our analysis allows for a complete evaluation of the incidence and prevalence of hysterectomy.

Intrapartum hemorrhage, resulting from abnormal placentation, placental abruption, as well as uterine rupture and atony, constitutes the most common indication for obstetric hysterectomy. The abovementioned conditions, leading to life-threatening uncontrolled hemorrhage, are responsible for high mortality rates in the developed and developing countries (1:100,000 and 1:1000 women, respectively) [7, 8].

The decision about the type of hysterectomy should always be individualized, as needed. Amputation of the uterine corpus is technically less challenging, connected with shorter time of the procedure, less blood loss, and fewer complica-

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tions [1, 9, 10]. The steadily growing rate of cesarean sections results in a higher number of obstetric hysterectomies. Identification of pregnant women at high risk for PH may significantly lower the incidence of that procedure [11].

OBJECTIVES

The aim of the study was to analyze cases of obstetric (both, peri- and postpartum) hysterectomies.

MATERIAL AND METHODS

Medical records of 52 women who underwent peri- or postpartum hysterectomy were retrospectively analyzed. Surgeries were performed at two gynecology and obstetrics wards, between 1985–1999 at the Local Hospital in Lipsko, and between 1998–2012 at the Specialist Hospital in Radom. The following patient characteristics were analyzed: age, gravidity, parity, length of pregnancy, mode of delivery, neonatal birthweight, and Apgar score, as well as indications for cesarean section (CS). As for PH, the following parameters were analyzed: indications, extent, complications, and length of postoperative hospitalization.

RESULTS

Out of 42 287 deliveries, 9090 (21.5%) were cesarean sections. The rate of obstetric hysterectomies was 0.123% (0.092% and 0.031% of peri- and postpartum surgeries, respectively). The rates after vaginal birth (VB) (n = 33197) and during/after CS (n = 9090) were 0.033% and 0.451%, respectively. Peri- and postpartum hysterectomies were performed in 39 (75%) and 13 (25%) patients, respectively (Table 1).

Mean patient age was 32.6 ± 6.17 years, with multiparas constituting 92.31% of the study population. Mean length of pregnancy was 38.1±3.9 weeks of gestation (Tables 2 and 3).

Total hysterectomy was performed in 43 (82.7%), while amputation of the uterine corpus in 9 (17.3%) of the investigated subjects. Total hysterectomy and amputation of the uterine corpus without adnexal dissection was carried out in 39 (75%) women. Total hysterectomy and amputation of the uterine corpus with removal of adnexal structures, uni- or bilaterally, was performed in 8 (15.4%) women due to history of malignancy or concomitant neoplastic processes, hematoma of the infundibulum-uterine ligament or the parametrium, penetrating extraperitoneally towards the kidney (Table 4).

Among the study population, 7 (13.5%) women had a history of hospitalization, including 5 with history of surgery, in other wards. The following number of women were

Table 2. Characteristics of women after peripartum and postpartum hysterectomy (n = 52)

Parameter	Descriptive statistics (n = 52)		
	Range	Mean	± SD
Maternal age (years)	17–43	32.6	6.17
Gravidity	1–8	3.6	3.0
Parity	1–8	3.2	2.4
Primiparas n (%)	4 (7.69)		
Multiparas n (%)	48 (92.31)		
No. of deliveries	42 287 (100%)		
No. of cesarean sections	9090 (21.5%)		
Peripartum hysterectomy	39 (75%)		
Postpartum hysterectomy	13 (25%)		
Hospitalization after peri- and postpartum hysterectomy (days)	10.1 (range: 4–20)		

SD — standard deviation

Table 3. Length of pregnancy and neonatal birthweight

Parameter	Range	Mean	± SD
Length of pregnancy (weeks) n = 52	28–42	38.1	3.9
Neonatal birthweight [g] n = 53[x]	1080–4350	3116	519

SD — standard deviation; [x] — one twin gestation

Table 1. Peripartum and postpartum hysterectomy (n = 52)

Parameter (hysterectomy after CS)	Peripartum hysterectomy n = 31 (59.6%)					Postpartum hysterectomy n = 10 (19.2%)		Total (%)
No. CS	1	2	3	4	5	1	2	**41 (78.8)**
Hysterectomy after CS	1	3	8	2	1	2	2	**19 (36.5)**
Hysterectomy after CS and earlier VB	14		2			6		**22 (42.3)**
Parameter (hysterectomy after VB)	**Peripartum hysterectomy n = 8 (15.4%)**					**Postpartum hysterectomy n = 3 (5.%)**		**Total (%)**
No. VB	1	2	3	4	6	1	4	**11 (21.2%)**
Hysterectomy after VB	2	1	1	1	1		1	**7 (13.5%)**
Hysterectomy after VB and earlier CS	1			1		1	1	**4 (7.7%)**

CS — cesarean section; VB — vaginal birth

Table 4. Type of obstetric hysterectomy

Parameter	PH during CS and postpartum hysterectomy after CS n = 41 (78.8%)		Hysterectomy after VB n = 11 (21.2%)		Total number (%)	
	No. (%) of PH (incl. during relaparotomy)	No. (%) of postpartum H	No. (%) of PH	No. (%) of postpartum H		
Type of surgery	31 (59.6) [4 (7.7)]	10 (19.2)	7 (13.5)	4 (7.7)	52	100
Wertheim-Meigs hysterectomy with bilateral adnexal dissection	1				1	43 82.7
H Wertheim-Meigs hysterectomy with bilateral oophorectomy	1				1	
Hysterectomy with bilateral adnexal dissection	1			1	2	
Hysterectomy with unilateral adnexal dissection	4 [1]		1		5	
Hysterectomy with bilateral oophorectomy	2				2	
Hysterectomy with unilateral oophorectomy	1 [1]				1	
Hysterectomy without adnexal dissection	15	8	6	2	31	
Amputation of the uterine corpus with unilateral adnexal dissection	1 [1]				1	9 17.3
Amputation of the uterine corpus without adnexal dissection	5 [1]	2		1	8	

CS — cesarean section; VB — vaginal birth

Table 5. Indications for CS in patients undergoing obstetric hysterectomy (n = 41)

Parameter	Descriptive statistics n = 41 (100%)	
	No. of surgeries	(%)
Placenta previa	5	12.2
Placenta previa / placenta accreta, placenta increta	9[x]	22.0
Placental abruption	4	9.8
2 earlier CSs	4	9.8
Elective CS	5[xx]	12.2
Fetopelvic disproportion	3[x]	7.3
Uterine myomas	2[x]	4.8
Risk for intrauterine fetal asphyxia	3	7.3
Tumor of the lesser pelvis	1	2.4
Breech presentation	4	9.8
High fetal station	1[x]	2.4

[x] > 1 indication; [xx] concomitant or earlier malignancy (ovarian and cervical cancer)

admitted due to risk factors for PH: during pregnancy — 2, after CS and relaparotomy (on the day of surgery) — 2, and postpartum (after CS) — 3 patients.

Out of the 41 (78.8%) women who required hysterectomy during or after CS or postpartum, 22 subjects had history of VB. Hysterectomy after VB was performed in 11 (21.2%) women, including 4 with history of VB (Table 1).

Indications for CS are presented in Table 5. Main indications for CS included abnormal placentation and placental abruption (44.0% in total), followed by fetopelvic disproportion, abnormal fetal presentation, and breech presentation (12.2% in total). The last two indications included history of CS and the risk for intrauterine fetal asphyxia (9.8% and 7.3%, respectively).

Complications of peri- and postpartum hysterectomy resulted in the need for blood and blood product transfusion in 94.2% of the women; symptoms of hypovolemic shock were observed in 11 (21.2%), and 8 (15.4%) subjects required ICU admission (Tables 6 and 7).

Complications of the lower part of the urinary tract during hysterectomy were observed in 7 (13.5%) patients. Vesicovaginal fistula was found in 1 (1.9%) woman on postoperative day 10 after hysterectomy performed on day 28 days postpartum and 1 (1.9%) case of ureter injury (left) was noted.

Reoperation after PH was required in 4 (7.7%) patients, including 2 after VB. Three such cases were noted after total hysterectomy, including 1 case of amputation of the uterine corpus. Symptoms of hypovolemic shock were noted in all women who underwent reoperation, and 2 who required admission to the ICU.

The presence of a tumor in the pouch of Douglas (degenerated neurilemmoma) was the reason behind PH in 1 case, and bleeding at the site of tumor incision deemed reoperation necessary.

Maternal death on postoperative day 4 after reoperative hysterectomy with unilateral removal of the adnexal struc-

Table 6. Indications for peripartum and postpartum hysterectomy (PH) (n = 52)

Parameter	Hysterectomy after CS n = 41 (78.8%)		Hysterectomy after VB n = 11 (21.2%)		Total 52	% 100
	No. of cases	(%)	No. of cases	(%)		
Placenta previa	6	11.5			6	11.6
Placenta previa / accreta / increta	8	15.4			8	15.4
Placenta accreta / increta	3	5.8	3	5.8	6	11.6
Placental abruption	3	5.8			3	5.8
Uterine rupture	1	1.9	4	7.7	5	9.6
Uterine atony			2	3.8	2	3.8
Post-CS hemorrhage	4	7.7			4	7.7
Elective CS[X]	5	9.6			5	9.6
Uterine myomas	1	1.9			1	1.9
Tumor in the pouch of Douglas[XX]	1	1.9			1	1.9
Infection of the internal reproductive organs (postpartum hysterectomy)	9	17.3	1[XXX]	1.9	10	19.2
Vesicouterine fistula			1	1.9	1	1.9

[X] concomitant or earlier malignancy (ovarian and cervical cancer); [XX] neurilemmoma (ancient schwannoma); [XXX] concomitant (postpartum) venous thrombosis of the lower pelvis

Table 7. Complications during and after PH and postpartum hysterectomy (PH) among 52 patients

Complication	No. of cases	(%)
ICU admission	8	15.4
Relaparotomy	4	7.7
Hypovolemic shock	11	21.2
Bleeding from injured right internal iliac artery	1	1.9
Urinary bladder injury	5	9.6
Ligation of the left ureter	1	1.9
Vesicovaginal fistula	1	1.9
Blood transfusion	49	94.2
Maternal death	1	1.9

Table 8. Risk factors for obstetric hysterectomy

Parameter	No. of cases	(%)
Multiparity	48	92.3
History of CS	45	86.5
Age > 35 years	16	30.8
Placenta previa	14	26.9
Uterine myomas	5	9.6
Twin gestation	1	1.9
Tumor of the lesser pelvis	1	1.9

tures (right side) was noted in 1 case (primipara, aged 35, after CS) due to hypovolemic shock and multiorgan failure (Table 7).

Mean length of hospitalization after hysterectomy was 10.1 days (range 4–20 days).

The following risk factors for obstetric hysterectomy were observed: multiparity, history of CS in the current and earlier pregnancy, age > 35 years. Multiparas constituted 92.3% of the group undergoing peri- and postpartum hysterectomy. Hysterectomy after CS and after VB with history of CS was performed in 86.5% of the subjects (Table 8).

Intrauterine fetal demise was observed in 4 (7.6%) cases. Extremely poor neonatal condition was noted in 4.1% of the infants. Medium and high Apgar scores were observed in 16.3% and 79.6% of the neonates, respectively. One (1.9%) neonate died on the first day of life. Mean neonatal birthweight was 3116 ± 519.

Therapeutic management of the affected women required cooperation of obstetricians with other specialists, especially anesthesiologists, urologists, surgeons, and general practitioners.

DISCUSSION

Hysterectomy, also in the postpartum period, is performed in the absence of improvement after conservative therapy — pharmacological or surgical. In the event of peripartum hemorrhage, the management includes stimulants of uterine contractions, replacement of blood and fluids, and treatment with blood and blood products. Surgical management includes visual instrumental inspection of the uterine cavity, surgical repair of injury to the birth canal, and suturing of the uterine arteries using the vaginal approach (after

VB). In case of laparotomy, surgical management includes repair of the uterine injury, hemostatic suturing, ligation of the uterine arteries, suturing of the uterine-ovarian arteries, and ligation of the internal iliac arteries. Obstetric hysterectomy was also performed when conservative management failed, in cases of persistent hemorrhage or if symptoms of disseminated intravascular coagulation developed and intensified. The procedures of conservative management with surgical intervention were implemented only if the complications allowed it and patient condition was stable.

The literature offers varying reports on PH rates, with the lowest (0.02%) in Ireland and the highest (0.95%) in RPA [4, 12]. Data about other countries include 0.024% for Denmark, 0.041% for UK, and 0.146% for the Czech Republic [13–15]. In the developing countries, with low socio-economic status, the rate of obstetric hysterectomy is several times higher. Also, significant differences in hysterectomy rates are observed depending on the region of a given country. Kayabasoglu et al., report the rate of 0.037% in the central part of Turkey, while Zeteroglu et al., 0.509% in the eastern part of Turkey [2, 16]. Similar findings have been published for Nigeria (0.26% and 0.62% according to Olamijulo et al., and Obiechina et al., respectively) [17, 18], and Pakistan (0.27% and 0.36% according to Korejo et al., and Fatima et al., respectively) [6, 19]. Obviously, the rates of obstetric hysterectomies are correlated with the role they play in the perinatal care system.

In our study, CS births constituted 21.5% of all deliveries. Szpejankowski et al., and Shellhaas et al., reported a 26.9% and 21.3% rate of hysterectomy after CS, respectively [20, 21]. Shellhaas et al., in their analysis of 13 centers from the USA, concluded that the incidence of hysterectomy in women after CS ranged from 0.2% to 0.8%. Our rate of 0.45% is comparable, also to the study by Szpejankowski et al. However, Rajewski et al., found a lower rate (0.12%) than the abovementioned authors [21, 22]. A steadily growing rate of CS is connected with placental complications in the subsequent pregnancies, e.g. placenta previa and accreta, which are the main causes for peripartum bleeding and the necessity of PH. Preventive measures which might lower the incidence of the abovementioned complications include detailed analysis of indications for CS.

Mean patient age in our study was 32.6 ± 6.17 years, which is consistent with reports from other Polish authors: Szpejankowski et al. — 30.7 years, Rajewski et al. — 31 years, and Jagielska et al. — 31.6 years [20, 22, 23].

Suchocki et al., cite authors who list uncontrollable uterine bleeding and cervical cancer among the indications for PH. Early-stage cervical cancer and patient wishes might be the reasons for conservative, fertility-sparing management. Hysterectomy may in fact be the only treatment option in some cases of abnormal placentation, large myomas in unfortunate locations, or necrotic fibroids. Modern diagnostic methods (Color Doppler and MRI) allow for early detection and implementation of various methods of conservative management, including pharmacological therapy and interventional radiology [24, 25].

In our study, different variants of abnormal placentation constituted the most common (44.4%) indication for obstetric hysterectomy, which is consistent with Polish (Rajewski et al. — 44.0%, Poręba et al. — 38.5%) and international (Jones et al. — 70.4%, Obiechina et al. — 48.3%) reports [14,18, 22, 26]. In the developing countries, uterine rupture and atony were the main indications for obstetric hysterectomy; 45.7% and 21.75% (Fatima et al.); 47.1% and 28.9% (Korejo et al.), 77.2% and 10.5% (Rabiu et al.), respectively) [6, 19, 27].

Infection of the internal reproductive organs was the second most frequent cause of obstetric hysterectomy in our study (19.2%), and a study by Szpejankowski et al. [20]. Elective (oncologic) causes — connected with history of cancer or concomitant malignancy of the genital tract and uterine rupture — were the third cause for surgery in our study population (9.6%), but the first indication for obstetric hysterectomy in some Polish and international publications [6, 24, 27].

The decision about the type of hysterectomy should always be individualized as needed, taking into account the general health status of the patient, indications, comorbidities, and concomitant diseases of the genital organs and minor pelvis. It is vital for the decision to be made in a timely manner as delayed intervention may deteriorate the overall patient condition and complicate treatment.

The literature presents various rates of total hysterectomy. Some authors performed only total hysterectomy [5, 21], e.g. Poręba et al., and Jagielska et at., in 90.6% and 87.5% of the surgeries [23, 26]. Amputation of the uterine corpus is less challenging technically, and is connected with shorter procedure time, less blood loss, and fewer complications [1, 9, 10].

In Arabic countries and countries of low-economic status, amputation of the uterine corpus is the preferred option. Rabiu et al., Obiechina et al., and Rahman et al., performed that procedure in 96.5%, 72.4%, and 72.1% of the women [8, 18, 27].

Latest reports described peripartum amputation of the uterine corpus, performed laparoscopically in a patient with a suspicion of placenta accreta, as minimally invasive [28].

In our study, subtotal hysterectomy was performed in 9 (17.3%) women and proved to be successful in 8 subjects. Reoperation and removal of the uterine cervix were necessary in 1 case.

Postpartum hysterectomy is most often performed due to hemorrhage or infection of the internal reproductive organs. In our study, postpartum hysterectomy — between

24h since delivery until late postpartum — was performed in 13 (25%) women, between 4 to 58 days (mean 22.6 days) postpartum. Out of them, 10 (19.2%) underwent CS and 3 (5.8%) delivered vaginally. The length of their hospitalization ranged from 5 to 15 days (mean 10.4 days). Eight (61.5%) patients from that group were admitted after unsuccessful conservative treatment and a stay at home. Three of them were admitted in life-threatening condition, 2 in hypovolemic shock, and 1 in a septic shock with concomitant deep venous thrombosis of the lower pelvis.

The causes of secondary postpartum hemorrhage during the postpartum period are different and remain to be fully elucidated. Subinvolution of placental implantation site vessels, as well as active inflammation process (viral or bacterial), leading to chronic 'local' intravascular coagulation and hemorrhage are among the hypothesized causes [29, 30].

Uterine myomas (confirmed by histopathology) were detected in 5 (9.6%) cases. CS, followed by PH, was performed in 2 patients: myomas were an indication for CS and elective hysterectomy in the first case and placenta accreta in the other. In the peripartum period, in 2 cases, necrotizing myomas were the reason behind hysterectomy. In the third woman (gravida 3, para 3), after VB and two previous cesarean sections, a vesicouterine fistula was found on postpartum day 5. Amputation of the uterine corpus without removal of the adnexal structures and fistula surgery were performed. The presence of a necrotizing myoma near the rupture site may have influenced fistula formation. Endometriosis was confirmed by histopathology in 3 cases. In 2 women, the endometriotic foci were located at the sites of uterine rupture following CS. In 1 patient, a multipara (4) after VB, endometriosis of the uterine corpus was associated with infection of the internal reproductive organs and concomitant deep venous thrombosis of the lower pelvis. Literature data about this type of pathology, which might greatly affect the postoperative process during postpartum, are limited at best.

In our study, complications of the lower urinary tract during hysterectomy were observed in 7 (13.5%) women, which is consistent with reports of Jagielska et at. (18%), and Szpejankowski et al. (18.7%) [20, 23].

A case of vesicovaginal fistula was found in 1 (1.9%) woman (gravida 4, para 4) on postoperative day 10 after hysterectomy, performed on day 28 days postpartum after CS. Also, there was 1 (1.9%) case of ureter injury - reoperation was performed on postoperative day 5 after hysterectomy due to uterine rupture after fourth delivery (vaginal). Multiparity (VB and CS) undoubtedly contributed to these complications. Shellhaas et al., reported 3.0% rate of ureter injury in their study [21].

Ureter injury was found in 1 (1.9%) patient. Reoperation was performed on postoperative day 5 after hysterectomy due to uterine rupture after fourth delivery (vaginal). Multiparity (VB and CS) undoubtedly contributed to these complications. Shellhaas et al. reported a 3.0% rate of ureter injury in their study [21]. Urological complications during CS due to abnormal placentation are correlated with the extent of placental invasion, number of previous cesarean sections, and perioperative blood loss [31].

In order for the number of complications during obstetric hysterectomy to decrease, it is vital to select high-risk patients for the procedure, thus allowing to refer them to secondary and tertiary referral centers, with highly qualified personnel, familiar with modern methods of conservative as well as surgical management of patients at risk for obstetric hysterectomy, adequate surgical training, laboratory premises, and supply of blood and blood products [11, 25]. In the event of earlier hospitalization of high-risk patients, there is a possibility to secure autologous blood of the patient [32]. In our study, the necessity of blood and blood product transfusion was noted in 94.2% of the women. Bachanek et al., Kayabasoglu et al., and Jagielska et al., transfused blood in 100% of their patients [5, 16, 23]. In our study, symptoms of hypovolemic shock were observed in 11 (21.25) women. Eight (15.4%) subjects required ICU admission, while other authors reported the following rates: 43.0% (Jagielska et al.), and 57.4% (Jones et al.) [14, 23].

Reoperation was necessary in 4 (7.7%) of our patients, usually due to bleeding to the abdominal cavity, injury, or other conditions which complicated the obstetric surgery. Rajewski et al., observed that complication in 20.0%, Yalinkaya et al. in 16.4%, and Rossi et al., in 10.5% of the hysterectomized women [22, 33, 34].

Tumor in the pouch of Douglas (degenerated neurilemmoma/ancient schwannoma) made PH necessary in 1 patient, and bleeding at the site of tumor incision deemed reoperation necessary. To the best of our knowledge, the available literature offers only a few reports on that particular tumor diagnosed in pregnancy, but no case reports about that tumor complicating the course of delivery and necessitating obstetric hysterectomy have been found.

Maternal death is the most common complication of obstetric hysterectomy. In our study, 1 case of maternal death due to hypovolemic shock and multiorgan failure was observed. Other authors also reported cases of maternal death: Shellhaas et al. — 1.6% out of 186 cases, and Rossi et al. — 2.6% out of 981 patients [21, 34]. The rates in the less developed countries are even higher: Korejo et al., reported a 9.0% incidence of maternal death, Yalinkaya et al. — 9.3%, Agrawal et al. — 19.4%, and Obiechina et al. — 31.0% [18, 19, 33, 35].

Mean length of hospitalization after obstetric hysterectomy in our study was 10.1 days, identical to the number of days reported by Rajewski et al., and similar to the result

of Yalinkaya et al. (10.0 days) [22, 33]. The results of studies by Fatima et al., and Szpejankowski et al., were 16.5 and 29.8 days, respectively.

Intrauterine fetal demise was noted in 4 (7.6%) women. One (1.9%) infant died on day 1 of life. Extremely poor, moderate, and good neonatal conditions were reported in 4.1%, 16.3%, and 79.6% of the children born to hysterectomized patients. Neonatal peripartum mortality in a study by Yalinkaya et al., was 22.1%, while Jagielska et al. reported no cases of neonatal death.

Mean neonatal birthweight was 3116 ± 519 g.

Therapeutic management of the patients required close cooperation of obstetricians with other specialists.

CONCLUSIONS

Hemorrhage resulting from pathological placentation and placental abruption has been the most common cause of obstetric hysterectomy.

Risk factors for obstetric hysterectomy included multiparity, history of CS in previous and current pregnancy, and age > 35 years.

Postpartum hysterectomy constituted a significant percentage of obstetric hysterectomies.

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