INTRODUCTION

Postpartum hysterectomy is a rare obstetric procedure, usually performed as a life-saving measure in cases of uncontrollable obstetric hemorrhage. Nowadays, the overall incidence of postpartum hysterectomy is 0.05%, although there are considerable differences all over the world, depending on modern obstetric practices, standards and the awareness towards antenatal care. Literature suggests a postpartum hysterectomy incidence rate of 0.24, 0.77, 2.3 and 5.09 per 1,000 deliveries, as stated by Sakse (Denmark), Whiteman (United States), Bai (South Korea) and Zeteroglu (Turkey), respectively. There is a lack of Portuguese data on this topic and to our knowledge there is no information available on the national incidence of postpartum hysterectomy in Portugal.

This retrospective study aimed to examine the incidence, indications, outcomes and complications of postpartum hysterectomy carried out in a Portuguese tertiary-care teaching hospital, between January 2000 and December 2013.

METHODS

Medical and pathological records of the patients who had undergone emergency postpartum hysterectomy due to postpartum hemorrhage, between January 2000 and December 2013, in a Portuguese tertiary-care teaching hospital, following vaginal or cesarean delivery, were reviewed retrospectively.

Cases were ascertained via a review of the hospital medical and pathological records.
Nine postpartum hysterectomies (60.0%) were performed after cesarean birth. Six were elective, while three were intrapartum cesareans. Indications for elective cesareans were placenta previa (three cases), abnormal presentation (one case), history of two previous cesarean sections, the latter occurring 20 months ago (one case) and maternal ophthalmic pathology with formal indication for cesarean delivery (one case). Intrapartum cesareans were carried out because of dystocia (two cases) and nonreassuring fetal status (one case).

Six postpartum hysterectomies (40.0%) were performed after vaginal delivery. Among these, four cases were reported of vaginal delivery with vacuum device (26.7%), whose indications were nonreassuring fetal status, in three cases, and absence of descent of the presentation, in one case.

According to our protocol, pharmacological agents and surgical procedures were used in an attempt to control hemorrhage and, therefore, avoid hysterectomy. All patients received oxytocin and prostaglandins. B-Lynch suture was performed in three cases, while uterine packing was made in three other cases. Pelvic vessel ligation was made in one case, while multiple square sutures were used in another case. Postpartum hysterectomy was performed in eleven cases (73.3%) due to uterine atony, followed by placenta previa and/or accreta in three cases (20.0%), and uterine rupture in one case (6.7%).

Further data on the operative complications, postoperative conditions and maternal and neonatal outcomes is shown in Table I. One case of intraoperative...

TABLE I. OPERATIVE COMPLICATIONS, POSTOPERATIVE CONDITIONS AND MATERNAL AND NEONATAL OUTCOMES

<table>
<thead>
<tr>
<th>Complication</th>
<th>Number of cases (%)</th>
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<tbody>
<tr>
<td>Maternal and neonatal complications</td>
<td></td>
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<tr>
<td>Maternal morbidity</td>
<td></td>
</tr>
<tr>
<td>Intraoperative bladder injury</td>
<td>1/15 (6.7%)</td>
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<tr>
<td>Relaparotomy for haemoperitoneum</td>
<td>1/15 (6.7%)</td>
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<tr>
<td>Disseminated intravascular coagulopathy</td>
<td>4/15 (26.7%)</td>
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<tr>
<td>Blood transfusions</td>
<td>15/15 (100%)</td>
</tr>
<tr>
<td>Admissions to the Intensive Care Unit</td>
<td>15/15 (100%)</td>
</tr>
<tr>
<td>Postoperative infection</td>
<td>1/15 (6.7%)</td>
</tr>
<tr>
<td>Maternal mortality</td>
<td></td>
</tr>
<tr>
<td>Maternal death after postoperative septic shock</td>
<td>1/15 (6.7%)</td>
</tr>
<tr>
<td>Neonatal complications</td>
<td></td>
</tr>
<tr>
<td>Neonatal morbidity and mortality</td>
<td>0/15 (0%)</td>
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</tbody>
</table>
bladder injury was reported in a patient with a previous cesarean section and one case of relaparotomy due to persistent intra-abdominal bleeding, both with good resolution. Four cases of disseminated intravascular coagulopathy that reversed with prompt treatment were identified. All patients received blood transfusions, with the average number of units of blood transfused being nine (range 4–35). Immediately after surgery, all patients were sent to the Intensive Care Unit. The average postoperative hospital stay was six days (range 5–25). There was one maternal death because of infectious postoperative complications following the development of septic shock. No cases were reported of neonatal morbidity and mortality.

**DISCUSSION**

The reported incidence of postpartum hysterectomy in the literature varies from 0.24 to 5.09 per 1,000 deliveries. Therefore, our incidence of 0.37 per 1,000 deliveries seems to be consistent with these studies.7-10

There has been a significant change in the indication of postpartum hysterectomy over time. Traditionally, uterine atony was the most common indication, although recent studies seem to indicate that abnormal placentation is replacing uterine atony. In 1984, Stanco reported that 43.4% of their postpartum hysterectomies were done because of uterine atony, while 33.9% were due to placenta previa. A study conducted in 1993 from the same institution stated that their primary indication was placenta accreta (45%), followed by uterine atony (20%).12 Also, a more recent study reported that the main indications for hysterectomy were abnormal placentation (50%) and atonic postpartum hemorrhage (32.8%).13 Our study shows that in our center the most frequent indication still remains uterine atony, followed by placenta previa, a feature that can be explained because of our low rate of cesarean delivery over time — average rate of 26%. During the period of our survey, there has been a steady decrease in the number of cesarean sections, which seems to explain the low incidence of placenta previa. Despite the above-mentioned reports, similar results have been described in the literature which were also explained by the low rate of cesarean delivery. The high prevalence of uterine atony as the main cause can also be explained by the characteristics of our women — the most of them were multiparous with more than 35 years old and had an induced labor, factors that increase the risk of uterine atony.15-17 In all the reported cases, we have tried conservative measures aimed at controlling the hemorrhage. Data analysis leads us to the conclusion that there is a considerable variability in the indications of postpartum hysterectomy worldwide which seems to vary according to the obstetric practice in each center.

Postpartum hysterectomy is associated with high complication rates.2,3,8,19 Bladder injury was found in one patient, a woman who had undergone a previous cesarean delivery. Thus, urological injuries appear to be related to scarring and secondary adhesion of the vesicouterine space following previous cesarean section. In comparison with Smith’s20 6%, Yucel’s21 8.8%, Zelop’s22 9%, Zeteroglu’s10 12.5% and Kwee’s2 15%, the urinary tract injury rate in our study is 6.7%. Reoperation for persistent postoperative bleeding was performed in one case (6.7%), compared with Ozden’s23 6.8%, Smith’s20 11%, Zeteroglu’s10 12.5% and Kwee’s2 25%. Four women (26.7%) developed disseminated intravascular coagulopathy in our series, which is lower than the 33% rate, previously reported by Smith and Mousa and Lau20,24. The febrile morbidity rate of 6.7% is also lower as compared with the literature, which is as high as 50% in some series20,25-28. There was one maternal death (6.7%) in our study. Lower rates of 4% and 4.5% were cited by Kwee’s (Netherlands) and Zeteroglu’s (Scandinavia), whereas much higher rates of 20% and 23.8% were found by Hamsho and Alszakka10 (Qatar) and Umezurike11 (Nigeria). After such analysis comparing our results with those described in the literature, it is our belief that our lower maternal morbidity and mortality rates may be related to a high rate of antenatal follow-up with an effort to identify the patients at risk of developing such postpartum complication, as has happened in the cases of placenta previa. In the other cases, however, in which the bleeding appeared unexpectedly, the success of its resolution resulted from an optimal obstetric intervention. In fact, particular emphasis should be laid on the fact that such management is usually run according to a clinical action protocol that provides a standardized procedure to evaluating and monitoring the patient, with a multidisciplinary team (obstetrics, nursing, anesthesiology, blood bank and laboratory) based on a very well-established stepwise approach towards these patients. Also worth stressing is the importance of having an adequate number of properly-trained obstetric teams (comprised of doctors and nurses) so as to deal with such situations.
The conclusions arising from our research indicate that during the period under study the incidence of postpartum hysterectomy in our center was lower than that described in the majority of the literature, and that the most frequent indication for such surgery was uterine atony followed by placenta previa and uterine rupture. Most of the cases occurred after cesarean delivery, which is a well-known risk factor for the occurrence of postpartum hemorrhage. Postpartum hysterectomy is usually associated with high maternal morbidity, something which was also confirmed in this study by the occurrence of urological and infectious complications and the need for blood transfusions.

Appropriate management of cases of postpartum hemorrhage is an important issue. Ideally speaking, each labor and delivery unit should have a postpartum hemorrhage protocol designed for patients with estimated blood loss exceeding a predefined threshold, often 1000 mL. These protocols actually provide a standardized approach towards these cases within a multidisciplinary team, in order to reduce the high maternal morbidity and mortality rates associated with postpartum hysterectomy.

REFERENCES