Peripartum hysterectomy and its indications

Peripartum hysterectomy is usually conducted as an emergency procedure for life-threatening haemorrhage after giving birth and is ‘one of the most devastating complications in obstetrics, particularly for women wanting to maintain their fertility’ (Wills 2012). Hysterectomy is considered to be a measure of last resort, after other more conservative measures, such as management of severe postpartum haemorrhage, have failed (Haynes et al. 2004). It can be a life-saving procedure.

The subject of this paper is emergency hysterectomy, although it is recognised that a woman may have a planned/elective caesarean delivery and hysterectomy where it is known that she has a serious medical or obstetric condition. For example, if a woman has diagnosed placenta accreta before she goes into labour then the risk of life-threatening postpartum haemorrhage may be so high that a caesarean delivery and planned hysterectomy may be the safest option for mother and baby. Other non-emergent indications for peripartum hysterectomy include sterilisation and cancer (Kastner et al. 2002).

Although peripartum hysterectomy is rare (0.06% of maternities in Victoria in 1999–2002), incidence appears to be increasing, possibly due to an increase in the rate of caesarean sections (Haynes et al. 2004). Peripartum hysterectomy is an expensive procedure due to blood transfusion and intensive care management costs (Knight 2007).

Significance to maternal morbidity and mortality

Peripartum hysterectomy has a decisive impact on future fertility; however there are other significant morbidities associated with the procedure. These can arise because of physical changes associated with pregnancy such as enlarged uterine and ovarian vessels, friable pelvic tissue, distortion of the anatomy around the site of uterine rupture, intrusion of the placenta into other organs (such as with placenta percreta), and scarring from previous caesarean sections. In an emergency situation, the patient is also likely to be seriously ill (Umezurike & Adisa 2012).

Complications of hysterectomy include intraoperative complications (blood loss and need for transfusion, bladder injury, ureteral injury, intestinal injury, vascular injury, other operative injury); perioperative surgical complications (reoperation, postoperative haemorrhage, wound complication, venous thromboembolism); and postoperative medical complications (cardiovascular, pulmonary, gastrointestinal, renal, infectious). Peripartum hysterectomy is also associated with increased mortality, primarily due to haemorrhage, renal failure or sepsis (Umezurike & Adisa 2012; Wright et al. 2010).

Women who have a peripartum hysterectomy are also more likely to receive a transfusion (46% compared with 4% of women who had non-obstetric hysterectomies), and to stay in hospital for longer (mean of 8.7 days compared with 2.9 days for non-obstetric hysterectomy) (Wright et al. 2010).

Risk factors and causes

The primary risk factor for peripartum hysterectomy is haemorrhage, most commonly associated with uterine rupture, retained placenta, morbidly adherent placenta or uterine atony (Bodelon et al. 2009; Howell et al. 2012). Other risk factors include placenta praevia, placental abruption, uterine infection, repeat caesarean section, increasing parity, increasing...
(See also the AIHW website for the related National Maternity Data Development Project (NMDDP) research brief in this
series on primary postpartum haemorrhage.)

The main risk factors for emergency peripartum hysterectomy appear to be changing over time, from uterine atony
to abnormal placental attachment (placentation) (Machado 2011; Umezurike & Adisa 2012). Abnormal placentation is
associated with rising rates of caesarean delivery and with increasing maternal age. Abnormal placentation may occur
more readily in the presence of a uterine scar such as that from a previous caesarean delivery, which may impair placental
attachment for future pregnancies (Awan et al. 2011; Sholapurkar 2013; Yang et al. 2007). In a study of 46 emergency
hysterectomies over 2008–2010, Lee and others (2012) reported a rate of emergency hysterectomy after caesarean
section that was 13 times the rate following vaginal delivery. Bodelon and others (2009) reported that the risk of peripartum
hysterectomy was highest in repeat caesarean sections. Vaginal Birth After Caesarean (VBAC) may also be a risk factor.
Women attempting VBAC were found to have almost twice the risk for peripartum hysterectomy as women without prior
caesarean section delivery (Bodelon et al. 2009).

Hysterectomy case rates have been found to be higher among older women, multiparous women, and overweight and obese
women—factors that are also associated with higher rates of caesarean section (Bodelon et al 2009; Howell et al. 2012).
Multiple pregnancy has also been reported as having an increased risk of emergency peripartum hysterectomy (Francois et
al. 2005). However Bodelon and others (2009) did not find this result in their study.

Prevalence/incidence, mortality and trends

The rate of peripartum hysterectomy was reported as 6.82 per 10,000 births in a Queensland study of 419 mothers who
had a peripartum hysterectomy between 2000 and 2011 (Wills 2012). Eight mothers (2%) died. Hutchinson and Joyce
(2014) reported an incidence rate for mothers giving birth in Western Australia in 2011 of 0.4 per 1,000 women (14
hysterectomies). This was the lowest rate in Western Australia in 7 years, with the highest rate of 0.8 per 1,000 being
reported for women giving birth in 2006.

Preliminary analysis for one study using data from the Australasian Maternity Outcomes Surveillance System (AMOSS) in
Australia and New Zealand in 2010–2011 estimated the incidence of peripartum hysterectomy to control haemorrhage to
be 6.0 per 10,000 women giving birth (at 20 weeks or more gestation) (AIHW et al. 2014). A United Kingdom Obstetric
Surveillance System (UKOSS) study in 2005–2006 produced an estimate of 4.1 per 10,000 deliveries (at 24 weeks or more
gestation) (Knight et al. 2008). In both studies, fewer than 1% of the women who had a hysterectomy died. (AMOSS is the
Australasian equivalent to UKOSS).

Machado (2011) reviewed international literature over the last two decades on emergency peripartum hysterectomy and
found that the incidence ranged from 0.24 to 8.7 per 1,000 deliveries. Incidence was reported to be 0.3 in the Netherlands,
0.2 in Norway, 0.3 in Ireland, 0.5 in Israel, 0.6 in Saudi Arabia and 1.2 to 2.7 per 1000 deliveries in the United States of
America. Mortality ranged from 0 to 12.5%, with a mean of 4.8% (Machado 2011).
The Machado review revealed a difference in the incidence of emergency peripartum hysterectomy following vaginal delivery compared with caesarean section. The incidence following vaginal delivery varied from 0.1 to 0.3 per 1,000 deliveries and this was fairly stable across studies from both Europe and the United States of America. However, the incidence following caesarean section varied widely between 0.2 and 8.7 per 1,000 deliveries. This was attributed to the proportion of women who had a previous caesarean section and therefore had a concurrent risk of placenta praevia and accreta (Machado 2011).

**Incidence for risk factors for peripartum hysterectomy**

Rates of postpartum haemorrhage—the main risk factor for peripartum hysterectomy—in high resource countries, including Australia, Canada, the United Kingdom and the United States of America, are said to be increasing, primarily due to uterine atony (Knight et al. 2009; Joseph et al. 2007).

It is possible that there may be an association between placenta accreta and previous caesarean delivery. Bateman and others (2012) attributed most of the increase in peripartum hysterectomy to rising rates of caesarean delivery after analysing the data by primary and previous caesarean delivery.

The rate of caesarean section delivery has increased in many middle- and high-income countries in recent years (Bertran et al. 2007; D’Souza & Arulkumaran 2013). This may be due to changes in clinical practices, an ageing maternal population or because of social and cultural factors that have increased the rate of maternal requests for caesarean delivery. There is concern that the rising rates of caesarean section in Australia, from 18% in 1991 to 32% in 2011 (AIHW 2014a), will lead to a marked increase in the rate of peripartum hysterectomies.

Rates of placenta accreta/increta/percreta are also thought to be increasing, due to increasing maternal age and previous caesarean delivery (Fitzpatrick et al. 2014; Khong 2008). Preliminary results from AMOSS demonstrate an incidence of 0.42 per 1,000 maternities in Australia (AIHW et al. 2014). A UKOSS study has estimated the rate of placenta accreta/increta/percreta to be around 0.17 per 1,000 births, or around 1 in 20 women with both a previous caesarean section and placenta praevia (Fitzpatrick et al. 2012).

There is further concern that conservative management of abnormal placentation, where the placenta is left in situ for resorption, may increase the risk of peripartum hysterectomy on readmission due to an increased risk of postpartum infection (Bodelon et al. 2009; Clausen et al. 2014; Grace Tan et al. 2013; Kayem et al. 2004). Clausen et al. (2014) found that 58% of cases where conservative management had been performed required a hysterectomy up to 9 months after giving birth. Current RANZCOG guidelines (2014) suggest that conservative management may be performed for cases of placenta accreta, but may result in hysterectomy in one-third of cases due to uncontrollable bleeding, which may be delayed several weeks after giving birth. The guidelines highlight that this may have serious implications if a woman is returning to a remote area with little facility to cope with a sudden severe haemorrhage (RANZCOG 2014).
Data collection and analysis issues

Having comprehensive data on peripartum hysterectomy would assist in answering questions such as:

- whether rates of peripartum hysterectomy are increasing in Australia
- whether Australia’s rates are in line with other countries
- why rates might be increasing and what the rate of change is
- whether rates vary across different population sub-groups
- whether clinical management practices are adequate
- whether the risk of morbidity and mortality due to predisposing factors for peripartum hysterectomy can be reduced.

Perinatal Data Collections

Jurisdictions do not collect peripartum hysterectomy as a discrete item on their perinatal data collection forms, and the item is not routinely supplied to, or required by, the National Perinatal Data Collection. On the paper forms of some jurisdictions, there are free text fields for procedures and operations during pregnancy, and for complications and events of labour and birth. It is not known how well such fields are completed as they are not explicitly for hysterectomy and are not highly visible on the forms. Many jurisdictions have established systems for the electronic receipt of perinatal data from hospitals, and these systems allow for greater flexibility in recording. Hospitals often use electronic maternity information systems where peripartum hysterectomy may be recorded and supplied to the jurisdictional health department for collation into that jurisdiction’s perinatal data collection. The Western Australian Mothers and Babies reports include information on the number and rate of hysterectomies, as well as trends and reasons for the procedure (Hutchinson & Joyce 2014).

The scope of perinatal data collections is restricted to the birth episode and ends with the mother’s discharge from hospital. Hence, information about events affecting the mother and baby and occurring in the 6 weeks postpartum (the end of the peripartum period) will not usually be recorded in the perinatal data collection.

Admitted patient collections

A hysterectomy procedure would normally be recorded on the woman’s hospital separation record. The recording of the hysterectomy procedure, a major and clearly defined operation that would also attract hospital funding due to its costly nature, should in theory be straightforward to code, and be well recorded in the hospital morbidity system. However, clinical coding is not perfect, and there is some scope for hysterectomy procedures as they relate to pregnancy, and particularly for the indications for peripartum hysterectomy, to be under-recorded in hospital morbidity data.

As records in the admitted patient collections are episode-based, if a woman is re-admitted for a hysterectomy after having been discharged from the birth episode, this would constitute a new episode of care that may only be picked up through data linkage or other cross-checking of records. Sometimes a mother may be admitted for the hysterectomy to a different hospital to the one that she gave birth in, and in most states would have a different hospital identification.
number. The record of this woman’s hysterectomy procedure is much less likely to be linked back to the birth episode. In some jurisdictions, a unique patient identification is used for most of the hospitals in the jurisdiction and therefore linkage would be easier, but is not routine. This is the case in Tasmania, Western Australia and the Northern Territory. Western Australia routinely performs linkage between its hospital morbidity and perinatal data collections. Such linkage also enables information about the mother’s demographics, medical history, pregnancy and birth to be examined together with the hospitalisation.

Validation of hospital data versus Perinatal Data Collection data

Validation of hysterectomy cases associated with postpartum haemorrhage was undertaken for the Haynes (2004) study by comparing data from the Victorian Perinatal Data Collection (PDC) with data from the Victorian Admitted Episodes Database (VAED). Neither data source was complete: 99 cases were found on both databases, 25 cases were recorded on the VAED but not the PDC, and 12 cases were recorded on the PDC but not the VAED. The main reasons for the mismatch included the procedure being recorded on forms but not entered into the database, and transfer of women to another hospital, meaning the woman’s birth record in the first admitting hospital did not have any information about the subsequent hysterectomy.

Australasian Maternity Outcomes Surveillance Study (AMOSS)

AMOSS is an ongoing series of studies of population-based research that describe the burden of rare and severe events in pregnancy, childbirth and the postnatal phase. Each condition is under surveillance for 1 year unless otherwise specified. Conditions have an estimated incidence of less than 1 in 1,000 births per year. Peripartum hysterectomy has been the subject of one study, but no results have been published yet (see <http://maternitymatrix.aihw.gov.au/Pages/CollDetails.aspx?DataCollID=8>).

While AMOSS could not be used as an ongoing data source for peripartum hysterectomy, it could potentially be used for validation of other datasets.

Data development undertaken through the National Maternity Data Development Project

Peripartum hysterectomy and Indications for peripartum hysterectomy are on the NMDDP priority data item list for national standardisation. There are currently no national data standards for these items. See Foundations for enhanced maternity data collection and reporting in Australia: National maternity data development project—Stage 1 (AIHW 2014b) for more information on the NMDDP priority data item list.

As the annual number of cases of peripartum hysterectomy is small, it is difficult to justify the collection of these items for every woman via the NPDC. Therefore hospital morbidity data will be used as the main data source for the new national standards once developed. Data linkage options may be explored in future to maximise case ascertainment and enable the recording of peripartum hysterectomy in the NPDC at the unit record level.
During 2015, the following national data standards have been developed:

- **Female—pregnancy-associated hysterectomy indicator, yes/no code N**
- **Female—peripartum hysterectomy indicator, yes/no code N**
- **Female—related condition contributing to pregnancy-associated hysterectomy, code N[N].**

All hysterectomies occurring in pregnancy (including those in early pregnancy) are included, with the creation of the data element ‘Pregnancy-associated hysterectomy indicator’. The data element ‘Peripartum hysterectomy indicator’ is conditional on a ‘yes’ response to the pregnancy-associated hysterectomy indicator. A ‘yes’ response to either of the first two data elements prompts the completion of the ‘indications’ (related conditions) data element. A comprehensive list of ICD-10-AM codes has been developed for the related conditions to allow extraction of these data from the National Hospital Morbidity Database (NHMD).

The AIHW will report on the new data elements from the NHMD and their connection with the Perinatal Data Set Specification will be retained via a hyperlink in METeOR.

Experimental national data on pregnancy-associated hysterectomy using the draft data elements have been published in the AIHW’s Perinatal Data Portal (see <http://www.aihw.gov.au/perinatal-data/>) and a working paper on the topic will be published in 2016.

**Importance of national collection of these data items**

Peripartum hysterectomy is a rare event, being associated with fewer than 1 in 1,000 deliveries in Australia each year. Factors with the potential to cause haemorrhage and infection increase the risk of peripartum hysterectomy, and are therefore of particular interest to clinicians in terms of prevention and management of this invasive and complicated procedure. Nationally consistent and regularly collected information on peripartum hysterectomy and its risk factors will allow investigation and monitoring of patterns and trends. This will be useful in informing clinical practice and assist in planning health service delivery.

**References**


AIHW 2014b. Foundations for enhanced maternity data collection and reporting in Australia: national maternity data development project stage 1. Cat. no. PER 60. Canberra: AIHW.


