

Postpartum Haemorrhage at Caesarean Section: A Retrospective Review of Risk Factors, Causes and Management in a Tertiary Hospital

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Introduction:
1 in 53 women (2.0%) giving birth via caesarean section (CS) had a major primary postpartum haemorrhage (PPH) of 1,500mL or more in 2023.1 The PPH rate at CS in our institution is higher when compared to equivalent services within Australia. We aimed to review the associated risk factors, causes and management of PPH at CS in order to identify areas for improvement to reduce the PPH rate.

Methods:
78 cases with a PPH 1,500mL or more during the period August 2024 to February 2025 were identified. Women who underwent a planned hysterectomy due to a known placenta accreta were excluded (n=7). A total of 71 cases were reviewed. A retrospective chart review was performed and data collected and entered into the data collection tool. Data was analysed to address the aims of our study.

- Aims:**
- Identify the prevalence of risk factors for PPH at CS.
 - Identify the causes of PPH at CS in our institution.
 - Evaluate the surgical techniques utilised for management of PPH at CS.
 - Evaluate the medical management of PPH at CS.
 - Evaluate other PPH management techniques at the time of CS.
 - Evaluate blood management at CS including blood product use.
 - Review postnatal care following PPH at caesarean

Primary indication for CS (n,%)	
Fetal macrosomia	6 (8.5)
Failure to progress/obstructed labour	19 (26.8)
Breech/malpresentation	6 (8.5)
Suspected fetal distress/abnormal CTG	15 (21.1)
Previous CS	21 (29.6)
- Attempting VBAC	2 (2.8)
Antepartum haemorrhage	10 (14.1)
Placenta praevia	13 (18.3)
Multiple pregnancy	2 (2.8)

Table 1

Type of CS (n,%)	
Lower segment	65 (91.5)
Classical	2 (2.8)
Upper segment	3 (4.2)
T/J Incision	1 (1.4)

Table 2

Experience of lead surgeon (n,%)	
Consultant	22 (31.0)
Senior registrar	24 (33.8)
Registrar	24 (33.8)
GPO	1 (1.4)

Table 3

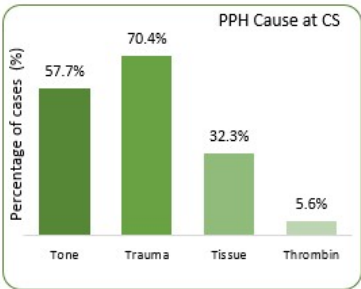


Figure 1

Results: The rate of PPH 1> 1,500mL observed during the audit period was 4.6%. Majority of these CS (77.5%) were non-elective and 53.5% occurred intrapartum. 42.3% of women were primiparous. 56.3% of women were obese (BMI >30kg/m²) with mean BMI 32.72 (range 20-52kg/m²). The two most common indications for CS were obstructed or slow labour progress and a history of prior caesarean section (Table 1). 54 cases (76.1%) were performed with regional anaesthetic, 7 cases (9.7%) were performed under general anaesthetic (GA), and 10 cases (14.1%) required conversion from regional to general anaesthetic during the procedure. Uterine atony and trauma were the causes for PPH in a majority of cases (Figure 1). Prevalent risk factors identified were primiparity, prolonged labour, induction/augmentation of labour, obesity, fetal macrosomia and placenta praevia (Figure 2). Bakri balloon insertion was the most commonly used surgical technique (Figure 3). 65 of 71 CS (91.5%) had a lower segment hysterotomy (Table 2). There was an even distribution of lead surgeon experience observed (Table 3). Oxytocin bolus with syntocinon infusion was used more than carbetocin for third stage management (63.4% vs. 35.2%) with minimal difference in average blood loss between groups (2,038 vs 1,940 mL). 85.9% of women received tranexamic acid. Cell salvage was used in 10 cases (14.5%), 9 of which had a known placenta praevia. The median haemoglobin drop postpartum was 28.5g/L and 40.8% of women received blood products postpartum. Average blood loss for women requiring blood products was 2223mL. Average length of stay was 4.9 days. 33.8% of cases had a documented immediate debrief with patient and/or partner.

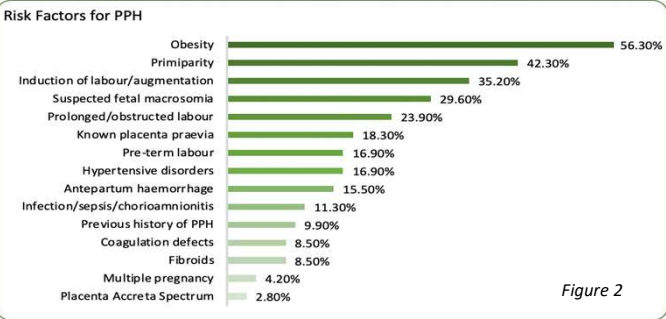


Figure 2

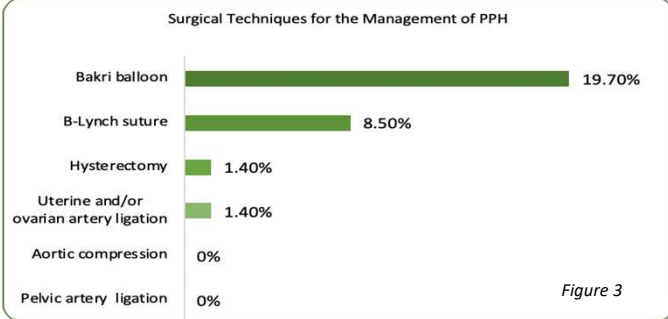


Figure 3

Discussion: Recommended key areas for change to reduce the rate of PPH at CS in our institution are outlined below.

- Implementation of a PPH risk assessment tool with a focus on the prevalent risk factors in our population to allow preventative measures such as cell salvage to be implemented early.
- Improve early diagnosis and escalation of PPH at CS by clinicians ensuring effective communication between team members in theatre and prompt assessment of bleeding while awaiting cord clamping and placental delivery. Improve the accuracy of estimation of blood loss estimation by introduction of routine weighing of abdominal packs and digital quantitative suction units.
- Aggressive preventative medical and surgical management of PPH. Consider early or preventative administration of medications (tranexamic acid and second uterotonic agents) and have a low threshold to administer second and third line uterotonic agents early if uterine atony is identified or if risk factors are present. Consider early application of Green-Armytage forceps while awaiting delivery of placenta and delayed cord clamping. PPH medication guideline review and update is recommended.
- Documentation can be improved with clearer description of PPH cause in operative records and time-accurate medication administration on anaesthetic records. Debrief of patients regarding a significant PPH is important and this should be clearly documented if performed as it may be currently under-represented in our data.
- A re-audit should be performed to review PPH rates following implementation of above strategies.

References:
1. AIHW (Australian Institute of Health and Welfare) (2025) [National Core Maternity Indicators](#), AIHW, Australian Government