

Ever-increasing incidence of postpartum haemorrhage in Hong Kong: a perspective

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Postpartum haemorrhage (PPH) is a leading cause of maternal morbidity and mortality. In 2022, the incidence of PPH in Hong Kong increased to a historic high of 14.7%, despite advances in prevention and treatment modalities such as the use of uterotonics, balloon tamponade, and compression sutures. Were the prevention and treatment modalities ineffective or were pregnant women at higher risk of PPH? Factors behind the increasing incidence of PPH include: (1) computerisation of medical records and improved coding resulting in increased awareness and openness in reporting; (2) higher maternal risks such as advanced maternal age, increasing rates of Caesarean section and thus previous Caesarean sections; and (3) increasing use of low-dose aspirin and low-molecular-weight heparin.

PPH is defined as a blood loss ≥ 500 ml within 24 hours of delivery, irrespective of the mode of delivery. The increase in incidence of PPH from 2016 to 2022 was attributed mainly to the increase in the category of blood loss of 501 to 1000 ml (Figure 1). In particular, cases with blood loss of 500 ml accounted for 3.7% of all maternity cases or 25.2% (3.7/14.7) of all PPH cases. Thus, this subgroup should be the target to reduce the overall incidence of PPH, which is 12.5% (8.8%+3.7%) of all maternity cases or 85.0% (12.5/14.7) of all PPH cases. Prevention is always better than treatment, and prevention of PPH reduces maternal morbidity and mortality and improves the childbirth experience.

Uterine atony was the most common cause of PPH, accounting for 47.4% of cases of PPH ≥ 500 ml (Figure 2). There are three types of uterotonic medications for prevention of PPH: Syntocinon, Syntometrine, and Carbetocin (Figure 3). Intramuscular Syntometrine is used

routinely after vaginal deliveries without contraindications such as hypertension, asthma, and valvular heart disease. Adverse effects of Syntometrine include increased blood pressure, headache, and vomiting. Intravenous (bolus and/or infusion) Syntocinon is commonly used after vaginal deliveries with a high risk of uterine atony such as high parity, induction of labour, instrumental deliveries, and contraindications to Syntometrine. Syntocinon is routinely used for PPH prophylaxis after Caesarean sections, which account for 30% of deliveries in public hospitals. The incidence of PPH (≥ 500 ml) after Caesarean sections has been as high as 30%, so it is the target subgroup. In 2017, Carbetocin was introduced into the drug formulary of the Hospital Authority. Initially, owing to the high costs, Carbetocin was limited to cases of Caesarean sections with high risk factors for PPH such as twin pregnancies, large fibroids, polyhydramnios, fetal macrosomia, and placenta praevia, all of which account for <10% of all deliveries in public hospitals. Some obstetrics units extend the indications for the use of Carbetocin to vaginal deliveries with high-risk factors for PPH. If the indications for use of Carbetocin as PPH prophylaxis were extended to all cases of Caesarean sections and vaginal deliveries with high-risk factors for PPH as well as those with contraindications for Syntometrine and ultimately to all cases of Caesarean sections and vaginal deliveries, the overall incidence of PPH (≥ 500 ml) could be reduced.

The World Health Organization and the Asia and Oceania Federation of Obstetrics and Gynaecology recommend using heat-stable Carbetocin (100 μ g,

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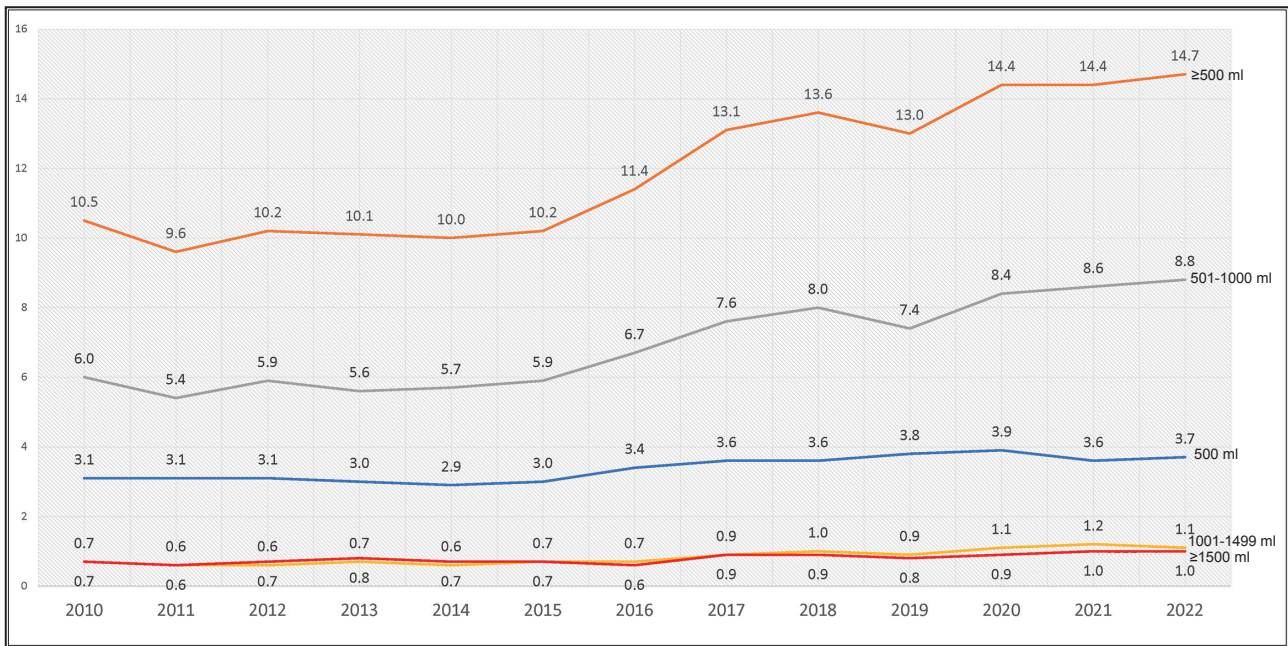


Figure 1. Incidences of postpartum haemorrhage (as percentages of maternity cases) in public hospitals from 2010 to 2022

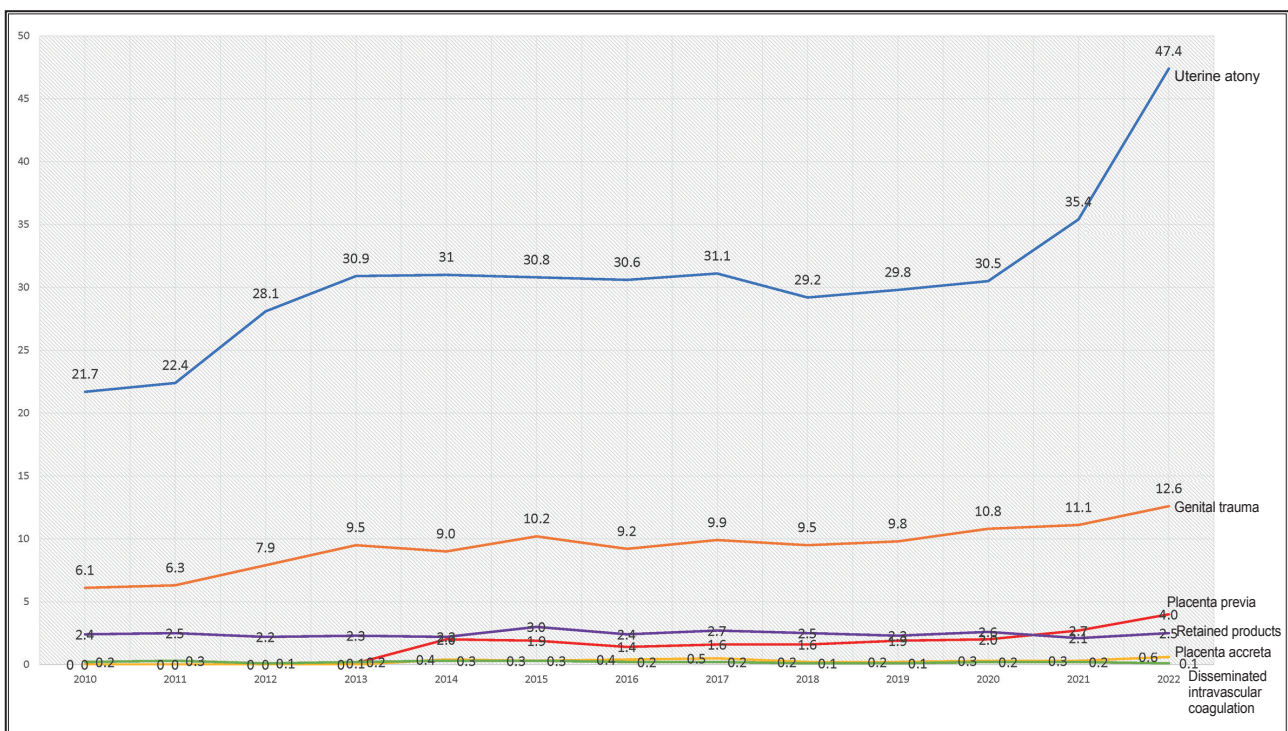


Figure 2. Causes of postpartum haemorrhage ≥500 ml and their percentages, irrespective of mode of delivery

intramuscularly or intravenously) for the prevention of PPH for all births in regions where its cost is comparable to other effective uterotonics¹⁻⁵. Intravenous Carbetocin can result in sustained uterine contractions within 2 minutes for about 6 minutes and then rhythmic contractions for

60 minutes, whereas intramuscular Carbetocin can result in sustained uterine contractions for about 11 minutes and then rhythmic contractions for 120 minutes. Apparently, this recommendation applies only to resource-challenged and warm-climate settings, where cold chain transport and

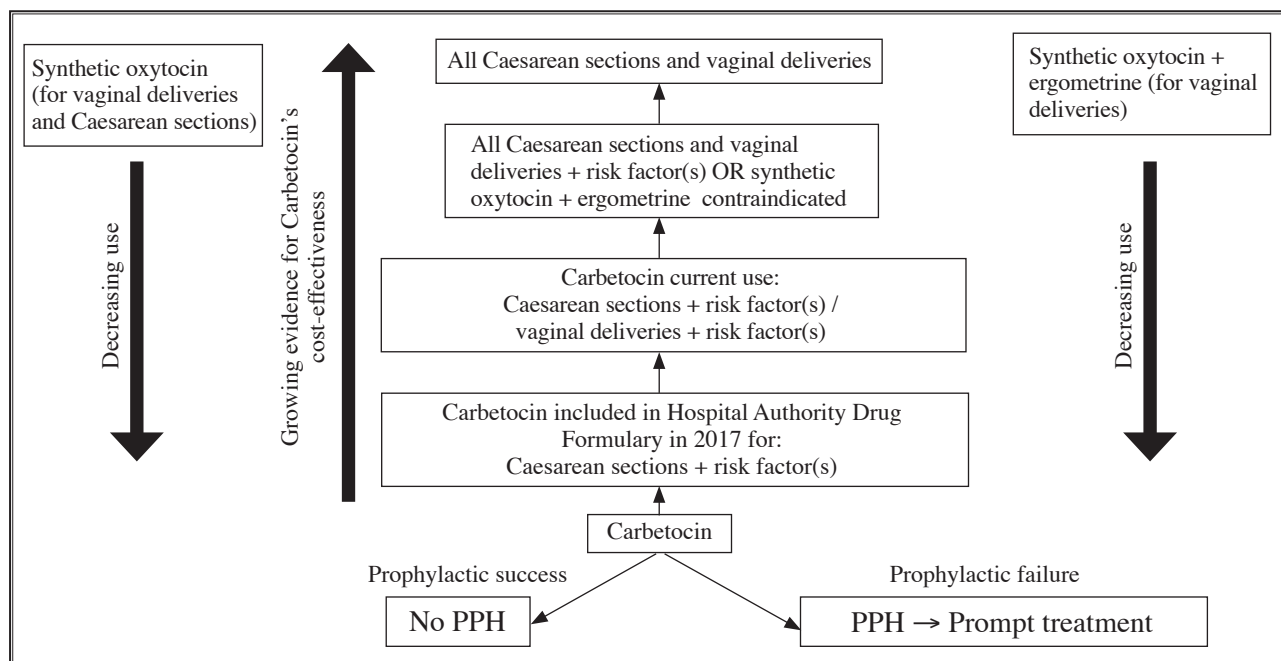


Figure 3. Uterotonics for postpartum haemorrhage (PPH) prophylaxis

storage are often not available, and the quality of oxytocin and other injectable uterotonics is compromised. However, Carbetocin is superior to Syntocinon in preventing uterine atony after Caesarean section and is non-inferior to Syntocinon for PPH prevention after vaginal deliveries. Carbetocin may not be more effective than Syntometrine, but its profile of adverse effects is much better. Thus, it is worthwhile stepping up the use of and indications for Carbetocin and then evaluating any change in the incidence of PPH. Although the cost of drugs will be increased, if the incidence of PPH is reduced, there may be significant savings in terms of reduced use of second-line measures (such as balloon tamponade and compression sutures), obstetric and midwifery manpower, and length of hospital stay (including in the intensive care unit or high dependency unit)⁶.

The increasing effectiveness of uterotonic prophylaxis reduces the overall incidence of PPH. If PPH occurs despite uterotonic prophylaxis, prompt treatment should be started including medical treatment (Syntocinon, Transamin, and Carboprost), second-line measures (balloon tamponade, compression sutures, and uterine artery embolisation), and, ultimately, hysterectomy. The overall incidence of PPH has been increasing, despite the increased use of all medical and second-line treatments, which are usually started after a blood loss of ≥ 500 ml. Thus, the overall incidence of PPH has not been reduced. The effectiveness of treatments would have been reflected

by the decreased incidences of PPH ≥ 1000 ml and emergency hysterectomy. However, the incidence of PPH of 1001 to 1499 ml or ≥ 1500 ml (defined as massive PPH) has remained at around 1% (Figure 1). The incidence of emergency hysterectomy for PPH has remained at 0.05% to 0.06% of maternity cases. Other outcome measures are related to the use of blood products (packed cells, platelet concentrate, fresh frozen plasma and cryoprecipitate) for PPH; such data are provided by the Hong Kong Red Cross Blood Transfusion Service.

Are medical treatments and second-line measures not used early enough and aggressively enough? In 2023, a group comprising representatives from obstetrics units of all eight public hospitals was formed to investigate the ever-increasing incidence of PPH and to recommend solutions. A comparative analysis of management details of PPH across the eight obstetrics units from 2014 to 2022 will be performed using big data from the Hospital Authority Clinical Data Analysis and Reporting System. It is hoped that the findings could provide insights into reducing the overall incidence of PPH.

Contributors

All authors designed the study, acquired the data, analysed the data, drafted the manuscript, and critically revised the manuscript for important intellectual content. All authors had full access to the data, contributed to the study, approved the final version for publication, and take

responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

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Data availability

All data generated or analysed during the present study are available from the corresponding author upon reasonable request.

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