COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS, SINGAPORE 2006

CONSENSUS STATEMENT ON MANAGEMENT OF POSTPARTUM HAEMORRHAGE

Background

Postpartum haemorrhage (PPH) remains one of the major causes of maternal deaths in both developing and developed countries.Worldwide, over 125 000 women die of PPH each year[1]. Antepartum haemorrhage (APH) and postpartum haemorrhage (PPH) contribute to maternal mortality but are linked by the fact that most cases of APH also involve PPH. Evidence from reports from confidential enquiries into maternal deaths in other countries have repeatedly identified substandard care[2] as a significant factor in haemorrhage-related maternal deaths. In recognition of the above, this consensus statement has been developed with the primary objective of establishing an evidence-based but clinically useful guideline for the appropriate management of women with postpartum haemorrhage. This document is aimed at all healthcare professionals who are involved in maternity care but specifically at fellows of the college, other obstetricians and midwives.

Definitions

The official World Health Organisation (WHO) definition of primary PPH is the "loss of 500 mls or more of blood from the genital tract within 24 hours of the birth of a baby[3]". The recommendations of this consensus statement apply largely to women experiencing this magnitude of blood loss.

Prevention

The use of prophylactic oxytocics in the active management of the third stage of labour reduces the risk of PPH[4] by 60%. Syntometrine (ergometrine 0.5 mg plus oxytocin 5 IU) is the agent of choice for prophylaxis in the third stage of labour for most women as compared to oxytocin alone as it results in a further reduction in the incidence of PPH[5] albeit at the expense of a higher incidence in vomiting.

When oxytocin alone is used, 10 IU should be used instead of 5 as the difference in effectiveness between this dose of oxytocin and Syntometrine is small[6].

Prediction

Any pregnant women is susceptible to postpartum haemorrhage but there are identifiable risk factors which allow the risk of significant PPH to be quantified. This information may be beneficial in planning the appropriate setting for the delivery and for heightened clinical vigilance following delivery. A list of known risk factors and the approximate odds ratio (OR) for PPH[7] are appended below.

Pre-existing risk factors identifiable before the onset of labour

Risk factor	Odds Ratio (OR) for PPH
Abruptio placentae	13
Known placenta praevia	12
Multiple pregnancy	5
Pre-eclampsia	4
Nulliparity	3
Previous PPH	3
Obesity	2

Risk factors becoming apparent during labour/delivery

Risk factor	Odds Ratio (OR) for PPH
Emergency caesarean section	9
Elective caesarean section	4
Retained placenta	5
Mediolateral episiotomy	5
Operative vaginal delivery	2
Prolonged labour (> 12 hours)	2
Big baby (> 4 kg)	2
Pyrexia in labour	2

Anticoagulation

The use of low-dose aspirin and prophylactic anticoagulation with low molecular weight heparins (LMWH) in pregnancy do not increase the risk of PPH[8]. However, women requiring therapeutic anticoagulation with heparin or warfarin and those with pre-existing haemorrhagic disorders (eg haemophilia) are at increased risk of PPH[8]. These women should receive antenatal care supervised by a specialist obstetrician in collaboration with a haematologist.

Management

Prompt and appropriate response in cases of massive postpartum haemorrhage is vital to a successful outcome. Experience from countries where statistics pertaining to causation of maternal deaths are sytematically collated and analysed, such as in the the UK, enable the identification of factors which are important determinants of successful

reuscitation. The 1991-1993 UK Confidential Enquiries into Maternal Deaths (CEMD)[9], identified the following aspects which were of particular relevance:

1) Accurate estimation of blood loss
2) Prompt recognition and treatment of clotting disorders
3) Early involvement of a consultant haematologist
4) Involvement of a consultant anaesthetist in resuscitation
5) The use of adequately-sized intravenous cannulae
6) The importance of monitoring central venous pressure

The following scheme is a suggested protocol for the management of postpartum haemorrhage.

The Management of Postpartum Haemorrhage
A) Basic measures (Perceived blood loss 500-1000 mls, no signs of hypovolaemic shock
B) Full protocol (Perceived blood loss > 1000 mls **OR** any clinical signs of shock

Basic measures (blood loss < 1000 mls, no shock)

Group and cross-match 2 units of whole blood
Full blood count
Clotting screen (PT/APTT)
I/V access with a 14 G cannula, commence infusion of Hartmann's solution
Clinical vigilance

These measures represent preparatory steps in anticipation of ongoing blood loss and evolving massive PPH. Further blood loss should initiate the activation of a full protocol for PPH as suggested below:

Full Protocol (Blood loss > 1000 mls OR shock)

A useful mnemonic is CRASH which stands for:

- **C**all for help
- **R**esuscitate
- **A**ssess
- **S**top **H**aemorrhage

These measures are to be undertaken ***simultaneously***

1) Call for help

- Experienced midwifery staff
- Senior obstetrician
- Senior anaesthetist
- Haematologist
- Porters for delivery of blood products/specimens

2) Resuscitate

- IV access with two 14 G cannulae
- Head down tilt
- Oxygen by mask 8 l/min
- Obtained cross-matched blood ASAP. Until blood arrives, infuse the following in sequence:

    a) Crystalloids (eg Hartmann's solution) to a maximum of 2 litres and colloids (eg Gelofundin) to a max of 1.5 litres (total volume of infused crystalloids and colloids should not exceed 3.5 litres[10,11].
    b) Unmatched emergency blood (O negative) if X-matched blood not yet available after 3.5 litres of colloids/crystalloids
    c) Fresh frozen plasma and cryoprecipitates may become necessary to replace depleted coagulation factors – seek advice from a haematologist.

- Use warming device
- Use a compression device to achieve rapid infusion
- Avoid blood filters (slows down transfusion)

3) Assess

- X-match 6 units
- FBC
- Coagulation screen
- Continuous pulse/BP/oximeter
- Foley catheter for urine output/ensure empty bladder
- CVP monitoring must be considered[12].

4) Stop Haemorrhage

- Exclude causes of bleeding other than uterine atony (genital tract trauma, uterine rupture, retained placental tissue)
- Bimanual uterine compression then proceed with the following steps until bleeding is controlled
- I/V ergometrine 500 mcg
- Syntocinon infusion (30 units in 500 ml N/saline over 4 hours)
- Per rectal misoprostol[13] 1000 mcg or gemeprost[14] (neither drug is licenced for the treatment of PPH).
- I/M Carboprost 250 mcg intramuscular or intramyometrial[15] (can repeat every 15 mins to a max of 8 doses)
- Early recourse to surgery and hysterectomy[16]

Surgical treatment

- A number of surgical treatments are useful in massive PPH secondary to uterine atony. In this consensus statement, emphasis is placed on techniques in which most specialist obstetricians are likely to be proficient and those for which evidence of successful outcomes are available in the published literature. The final choice of procedure is likely to be influenced by the experience and expertise of available staff.

- Balloon tamponade[17] – insertion of a Sengstaken-Blakemore (SB) tube (originally designed for the treatment of bleeding oesophageal varices) is a useful technique. A previously sterilised SB tube, which has had the portion distal to the stomach balloon cut off, is inserted into the uterine cavity using a pair of sponge forceps facilitated by grasping the anterior lip of the cervix with a second pair of sponge forceps. The oesophageal balloon is then filled with 150 ml of warmed saline. This "tamponade test" is successful when no active bleeding is seen both via the central lumen of the catheter and the cervix after inflation. If the test fails, a laparotomy must be performed. When this measure is deemed successful, the upper vagina should be packed with roller gauze to prevent expulsion of the balloon, broad-spectrum antibiotics comenced, a urinary catheter inserted to keep the bladder empty and a slow oxytocin infusion maintained over the next 12-24 hours.

- B-Lynch suture – this brace suture is designed to effect uterine compression and can be performed following caesarean section or vaginal delivery. B-Lynch described this technique in a series of women in whom complete haemostasis was achieved avoiding difficult and hazardous pelvic surgery[18]. The abdomen is opened via a pfannenstiel or midline incision. A lower segment incision is made after downward reflection of the bladder or, if PPH follows a caesarean section, the previous uterine incision is re-opened. The uterus is then exteriorised and bimanual compression applied to determine whether a compression suture is likely to be of value. If a reduction in bleeding can be demonstrated with this preliminary step, a B-Lynch brace suture is placed as described:

  A No 1 or 2 absorbable suture (vicryl or catgut) mounted on a round-bodied needle is used to puncture the uterus 3 cm below the right lower edge of the uterine incision and 3 cm from the right lateral border. The suture is then threaded through the uterine cavity to emerge at the upper margin 3 cm above and approximately 4 cm from the lateral border as the uterus widens from below upwards. The suture us now passed over the anterior surface of the uterus 3-4 cm medial to the right cornual border and take downwards along the posterior surface, entering the uterine cavity from the posterior wall of the uterus at the same level as the lower segment uterine incision on the anterior wall. The suture is then passed laterally and horizontally to the left side and the needle is used to exit the posterior wall of the uterus. Lastly, the suture is take upwards along the posterior wall of the uterus, over the fundus and brought down over the anterior wall, entering the uterine cavity above the uterine incision and exiting below the incision as on the contralateral side (see diagram). The suture is tied with help from an assistant who maintains bimanual compression until the knot has been tied securely. The lower segment incision is then closed. Success of the procedure is heralded by cessation of bleeding.

- Uterine artery ligation: the uterus receives 90 % of its blood supply from the uterine arteries. Uterine artery ligation is technically easier[19] than internal iliac artery ligation. After division of the utero-vesical fold, mobilisation of the bladder inferiorly and identification of the ureters, the uterus is elevated and a no 1 absorbable suture is passed medial to the uterine artery (to include a bite of the myometrium) and tied. The procedure is repeated on the other side.

- Internal iliac artery ligation[20] may be considered if appropriate expertise is available.

- Angiographic embolisation has been advocated[21] and is a viable option if appropriate on-site radiological support exists.

- Hysterectomy should be resorted to early[10,16] rather than late and before the woman is *in extremis.*

Summary of Recommendations

Obstetricians should adhere to a evidence-based protocol for the prevention and management of postpartum haemorrhage

Prophylactic oxytocics reduce the risk of postpartum haemorrhage and should be used routinely in the third stage of labour

Women who have identifiable risk factors for PPH should be delivered in a setting where appropriate clinical vigilance and care can be provided in the event of excessive blood loss.

Prophylactic anticoagulation in pregnancy does not increase the risk of PPH.

The presence of pre-existing haemorrhagic disorders or therapeutic anticoagulation increases the risk of PPH and these women should be jointly managed with a haematologist

Accurate estimation of blood loss is essential for the appropriate treatment of postpartum haemorrhage.

The management of postpartum haemorrhage should be based on a basic protocol for the management of asymptomatic women who have sustained significant blood loss and a full protocol for the management of massive PPH.

Summoning experienced help, resuscitation, assessment and measures to stop haemorrhage should proceed simultaneously in the management of massive PPH.

Resuscitation of women with massive PPH should involve a consultant obstetrician, a consultant anaesthetist and a consultant haematologist.

The use of adequately sized intravenous cannulae and appropriate use of central venous pressure (CVP) monitoring are important determinants in the successful resuscitation of massive PPH.

The recognition and treatment of clotting disorders as a consequence of massive blood loss is important in the resuscitation of women with PPH

If conservative measures fail to control bleeding, surgical methods of haemostasis appropriate to the level of available expertise and early recourse to hysterectomy must follow.

This consensus statement is produced on behalf of the College of Obstetricians and Gynaecologists, Singapore by:

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Valid until 2008
unless otherwise indicated

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