**Postpartum hemorrhage  PPH:**

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**LEARNING OBJECTIVES:**

**Fourth year students should be able to:**

1. Define primary and secondary PPH

2. List the causes and risk factors for PPH

3. Interpret the investigations results

4. Manage the cases of PPH

**Definition:**

**Primary postpartum haemorrhage (PPH)** is the most common form of major obstetric haemorrhage. The traditional definition of primary PPH is the loss of 500 ml or more of blood from the genital tract within 24 hours of the birth of a baby.

 PPH can be minor (500–1000 ml) or major (more than 1000 ml). Major can be further subdivided into moderate (1001–2000 ml) and severe (more than 2000 ml). In women with lower body mass (e.g. less than 60 kg), a lower level of blood loss may be clinically significant.

**Secondary postpartum haemorrhage (PPH)** is defined as fresh bleeding from the genital tract between 24 hours and 6 weeks after delivery.

* **The causes and risk factors of PPH: The four Ts**

**Tone,** **Tissue,** **Trauma, and** **Thrombin**.

**Tone: causes and risk factors of uterine atony**1. **Over distension of uterus**: Polyhydramnios, multiple gestation, macrosomia
2. **Intra-amniotic infection:** Fever, prolonged rupture of membranes
3**. Functional/anatomic distortion of uterus**: Rapid labour, prolonged labour, fibroids, placenta praevia, uterine anomalies
4. **Uterine relaxants**, e.g. magnesium and nifedipine Terbutaline, halogenated anaesthetics, glyceryl trinitrate
5. **Bladder distension:** May prevent uterine contraction

**Tissue: retained products of conception**
Retained cotyledon or succenturiate lobe Retained blood clots

**Trauma: genital tract injury**1.**Lacerations of the cervix, vagina or perineum:** Precipitous delivery, operative delivery
2. **Extensions, lacerations at caesarean section:** Malposition, deep engagement
3.**Uterine rupture**: Previous uterine surgery like Caesarean section
4. **Uterine inversion**: High parity with excessive cord traction

**Thrombin:** **abnormalities of coagulation**
**1.hereditary:** A History of hereditary coagulopathies or liver disease
Haemophilia, Idiopathic thrombocytopenic, von Willebrand’s disease
History of previous PPH

2.**Acquired in pregnancy**
Gestational thrombocytopenia, Pre-eclampsia with thrombocytopenia e.g. HELLP, Disseminated intravascular coagulation as in in utero fetal demise severe infection , abruption and amniotic fluid embolus

**Other risk factors for PPH**:

Increasing maternal age, primigravida, grand multiparity, preterm birth, Antepartum hemorrhage.

**Management:**

* **Diagnosis:**

**Clinical presentation**:

* ***History:*** Significant bleeding after childbirth or caesarean section (>500ml)

Risk factors:

* ***Examination:***

**General**: consciousness, pallor, sweating, cold extremities (features of shock), capillary refill, vital signs (tachycardia and hypotension)

The visual estimation of peripartum blood loss is inaccurate and that clinical signs and symptoms should be included in the assessment of PPH

**Abdominal exam**: uterine fundal height and consistency

**Pelvic examination**: inspection for amount of bleeding and perineal examination for any trauma

* **Treatment:**

**1. Communication and multidisciplinary care:**

Call or help **team work** (Obstetric emergency), explain to the patient and relatives what is going on, **multidisciplinary team** involving senior members of staff (senior obstetrician, anesthetist, senior midwife, intensive care unit preparation)

**2. Resuscitation:**

* Intravenous access (two 14 gauge cannulae)
* Urgent venepuncture (20 ml) for: blood group and Rh, full blood count, coagulation screen, including fibrinogen, renal and liver function , electrolytes
* A and B – assess airway and breathing, give 100% O2 by face mask
* C – evaluate circulation
* Position the patient flat and keep the woman warm
* Pulse rate, respiratory rate and blood pressure recording every 15 minutes
* commence warmed crystalloid infusion 1-2 L
* prepare blood 4-6 units and blood products (fresh frozen plasma, platelets, cryoprecipitate)
* Blood group O Rh –ve can be transfused while preparing blood
* Central venous pressure line.
* Foley catheter & fluid balance chart, vital sign chart with time record

3. **Assess the cause of PPH:**

**In cases of uterine atony** (the most common cause) a soft boggy uterus with larger than expected fundal height: a sequence of mechanical, pharmacological and surgical measures should be instituted until the bleeding stops:

* **Mechanical measures:**

**a.palpate the uterine fundus** and rub it to stimulate contractions (‘rubbing up the fundus’)

**b.Bimanual uterine compression** for 10 min by placing one hand in the vagina and pushing from front against the body of the uterus while the other hand compresses the fundus from above through the abdominal wall the posterior aspect of the uterus is massaged with the abdominal hand. **ensure that the bladder is empty** (Foley catheter, leave in place)

* **Pharmacological measures:**

**a.Oxytocin** 5 IU by slow intravenous injection (may have repeat dose)

 **b.Ergometrine** 0.5 mg by slow intravenous or intramuscular injection (contraindicated in women with hypertension)

 **c**.**Oxytocin infusion** (40 IU in 500 ml isotonic crystalloids at 125 ml/hour) unless fluid restriction is necessary

 **d.Carboprost** 0.25 mg by intramuscular or intramyometrial injection repeated at intervals of not less than 15 minutes to a maximum of eight doses (use with caution in women with asthma)

 **e.Misoprostol** 800 micrograms sublingually or rectally

* **Surgical measures**:

If pharmacological measures fail to control the haemorrhage, the team should consider transfer to the operating theatre for examination under anaesthesia, with an awareness of the impending need for laparotomy and/or hysterectomy, surgical interventions should be initiated sooner rather than later.

**a.Intrauterine balloon tamponade** is an appropriate first-line ‘surgical’ intervention for most women where uterine atony is the only or main cause of haemorrhage. Inflate with 200 – 400 ml of fluids for 24 hours.

**b. B Lynch suture:** Conservative surgical interventions may be attempted as second line, depending on clinical circumstances and available expertise.

c. **Uterine devascularisation** and **internal iliac artery ligation**

d. Interventional radiology, **Arterial embolization**

e. Resort to **hysterectomy** sooner rather than later if bleeding continues

Compression of the aorta may be a temporary but effective measure to allow time for resuscitation to catch up with the volume replacement and the appropriate surgical support to arrive

**IF the uterus is contracted but bleeding continues, think of other causes of PPH :**

Take the patient to the theatre and do examination under anesthesia:

IF retained products of conception: evacuate with antibiotics

IF genital tract trauma: surgical repair with vaginal pack

IF uterine inversion: reduce the inverted uterus

IF clotting disorders: give FFP, fresh blood, cryoprecipitate, rarely platelets

IF none of these and bleeding continues: conservative surgical measures and possible hysterectomy

**Therapeutic goals in massive PPH**:

Hb greater than 80 g/l

 Platelet count greater than 50 \* 109/l

 Prothrombin time (PT) less than 1.5 times normal

 Activated partial thromboplastin time (APTT) less than 1.5 times normal

 Fibrinogen greater than 2 g/l

* **Prevention:**

1.**Antenatal anaemia** should be investigated and treated appropriately as this may reduce the morbidity associated with PPH.

**2.Prophylactic uterotonics** should be routinely offered in the active management of the third stage of labour in all women as they reduce the risk of PPH.

For women without risk factors for PPH delivering vaginally, **oxytocin** (10 iu by intramuscular injection) is the agent of choice for prophylaxis in the third stage of labour. A higher dose of oxytocin is unlikely to be beneficial.

For women delivering by caesarean section, oxytocin (5 iu by slow intravenous injection) should be used to encourage contraction of the uterus and to decrease blood loss.

**3.Ergometrine–oxytocin** may be used in the absence of hypertension in women at increased risk of haemorrhage, it is possible that a combination of preventative measures might be superior to syntocinon alone to prevent PPH.

4.**Intravenous tranexamic acid** (0.5–1.0 g), in addition to oxytocin, at caesarean section to reduce blood loss in women at increased risk of PPH

5**.Misoprostol** 600µg po\*1 or 800µg sl\*1or rectal

**Secondary PPH** is defined as fresh bleeding from the genital tract between 24

hours and 6 weeks after delivery. The most common time for secondary PPH is between days 7 and 14.

**Causes:** is usually either endometritis or retained placental tissue. Other causes include hormonal contraception, bleeding disorders (e.g. von Willebrand’s disease) and occasionally choriocarcinoma

**Clinically**: women with endometritis have

1.constant or crampy low abdominal pain with vaginal bleeding

2.low-grade fever, purulent lochia

3. a tender uterus larger than appropriate

4. a closed or opened internal os in women with retained products of conception

**Investigations: mentioned in puerperal sepsis**

**Treatment:** .

1.Those bleeding heavily will require circulatory support with fluids or blood

2.strong oxytocics (e.g. ergometrine)

3. Uterine evacuation.

4. Antibiotics should be given if placental tissue is found, even without evidence of overt infection.

**Complications of PPH:**

Anemia, Hypovolemic Shock. Acute renal failure. Acute Liver failure. Acute pulmonary edema, consumption coagulopathy, transfusion reactions (iatrogenic). Death.

Long-term complications**:** puerperal infections.Sheehan’s syndrome (necrosis of anterior pituitary (. End organ failure. Infertility

**Other disorders of third stage:**

**Uterine inversion**

 Its rare complication of the third stage, incidence 1:2000 -1:6000.the uterine fundus descend through the uterine cavity, or rarely beyond the introits, can be occurred after C/S or vaginal delivery.

**Causes**

1. Mismanagement of the third stage – e.g. premature or excessive cord traction during active management of the third stage, a combination of fundal pressure and cord traction to deliver the placenta or use of fundal pressure when the uterus is atonic during placental deliver.
2. Abnormally adherent placenta.
3. Spontaneous inversion of unknown etiology
4. Short umbilical cord.
5. Sudden emptying of a distended uterus.

**Diagnosis**

The prolapsed uterus stretching the cervix causes vagal stimulation, so the women will have sign of cardiovascular collapse & shock, although bleeding is commonly present, the symptoms will be out of proportion to estimated blood loss due to vasovagal effects. The inverted uterus may be obvious at the introits as a bluish-gray mass. Lack of palpable uterus in the abdomen or feeling of a "dimple" in the uterine fundus on examination.

Vasovagal effects producing vital sign changes disproportionate to the amount of bleeding may be an additional clue.

**Treatment:**

The placenta often is still attached, and it should be left in place until after reduction. Every attempt should be made to replace the uterus quickly.

The Johnson method of reduction begins with grasping the protruding fundus with the palm of the hand and fingers directed toward the posterior fornix, the uterus is returned to position by lifting it up through the pelvis and into the abdomen once the uterus is reverted, uterotonic agents should be given to pro mote uterine tone and to prevent recurrence.

If initial attempts to replace the uterus fail or a cervical constriction ring develops, administration of magnesium sulfate, terbutaline (Brethine), nitroglycerin, or general anesthesia may allow sufficient uterine relaxation for manipulation.

Hydrostatic replacement, If these methods fail, the uterus will need to be replaced surgically.

**Retained placenta**

lack of expulsion of the placenta within 30 minutes of birth of the neonate

 ***Risk Factors :***Previous retained placenta, Previous injury or surgery to the uterus

Preterm delivery, Induced labor and Multiparty

***Causes:***

1. Constriction ring of the cervix.
2. Full bladder.
3. Uterine abnormality.
4. Morbid adherence of the placenta:
* Placenta Accreta.
* Placenta Increta.
* Placenta Percreta.

***Management***

If the placenta is undelivered after 30 minutes with no bleeding, consider:

1. Emptying bladder
2. Breastfeeding or nipple stimulation
3. Change of position – encourage an upright position
4. Uterotonic drugs: Oxytocin by intravenous, intramuscular, intra umbilical cord route
5. If after 20 minute of uterotonic drugs placenta not delivered, or **the patient has active bleeding**: transfer the patient to the theater for manual removal of placenta under anesthesia.
6. If failed remove it by curettage
7. If placenta was morbid, adherent hysterectomy may be done.

**Basic life support: approaching and treating apparently lifeless patient:**



**END OF LECURE**