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Obstetric surgery for periopertaive nurses and midwives

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Where a pregnant woman experiences trauma or has acute surgical needs there are additional concerns for the well being of both the woman and her foetus. This article explores obstetric procedures for the pregnant woman and discusses the implications for perioperative nurses and midwives.

Introduction

Nurses and midwives caring for pregnant women needing surgical interventions require specific knowledge and skills. While it is recognised that some pregnant women require surgery for non obstetric reasons this article focuses on obstetric procedures that require surgical intervention. Both early and late pregnancy conditions are considered along with the changes in maternal physiology and the immediate care of the newborn.

Early Pregnancy Conditions

Miscarriage/abortion

A woman may require surgical uterine evacuation (ERPC) for spontaneous incomplete miscarriage, missed miscarriage, suspected throphoblastic disease or therapeutic abortion. This can be performed under local anaesthesia or sedation. All products of conception are removed and methods used will depend on gestation and size of uterus. For a woman experiencing a miscarriage, ultrasound scan precedes evacuation to rule out the possibility of a viable pregnancy. The uterus and cervix are very vascular in pregnancy so procedures must be gentle to avoid the risk of trauma or uterine perforation (RCOG 2006). Vacuum aspiration may be sufficient to remove the uterine contents. All tissue obtained should be sent for histology to identify molar pregnancy and exclude ectopic if chorionic tissue is found on histology (RCOG 2006). Genetic studies may also be undertaken.

Where foetal parts are identified options for respectful disposal are discussed with parents pre or postoperatively and their views respected (RCN 2007). Incineration as part of hospital clinical waste is unacceptable and guidelines are available to nurses and midwives on this issue (RCN 2007).

Extrauterine or ectopic pregnancy

Implantation of the fertilised ovum may occur in a fallopian tube or less commonly in the abdomen or on an ovary. Early ectopic pregnancy may be difficult to diagnose, the woman presents with history of positive pregnancy test and experiences abdominal pain or tenderness with or without vaginal bleeding (RCOG 2006). An ectopic pregnancy is often confirmed by abdominal or transvaginal ultrasound. Tubal rupture may occur at 5-7 weeks of gestation which leads to intraperitoneal haemorrhage; blood is found in the Pouch of Douglas. This is an acute surgical emergency. A laparoscopy or laparotomy is performed to open the affected tube and remove products of conception. Where possible a salpingotomy is performed avoiding salpingectomy and possible reduction of fertility (RCOG 2004).

Ongoing pregnancy

The foetus is considered potentially viable at 400 grams or 23 weeks gestation though there are risks of significant morbidity at the extremes of viability (American Academy of Pediatrics (AAP) 2006). The most common surgical procedure on pregnant women is caesarean section, which may be performed for foetal or maternal reasons.

During pregnancy changes occur in the woman's anatomy and physiology which can alter the position of organs and landmarks used during abdominal surgery (Melnick et al 2004). To calculate gestation most women will have an ultrasound scan in early pregnancy. The uterus rises above the symphysis pubis at 12 weeks; it is below the umbilicus at 24 weeks and reaches the xiphisternum, under the diaphragm at 36 weeks gestation. Depending on the growth of the foetus and the number of foetuses present the uterus may be larger or smaller than expected.

The pregnant woman experiences haematological and biochemical changes. Haemoglobin (Hb) levels are commonly 10-12g/dcl and reach their lowest level between 30-34th week. Oxygen consumption increases by 20% or more if the woman is in labour, and as foetal well being is dependant on the maternal well being and placental perfusion, foetal oxygenation is dependent on maternal oxygenation (Rankin 2005). Supplementary oxygen maybe required (Jordan 2002). For the woman with epidural or spinal anaesthesia, hypotension is a risk factor which will diminish placental perfusion. Hypoventilation and hyperventilation may also induce hypoxia and hypercapnia in both the woman and her foetus. As a consequence the choice of anaesthetic and the positioning of the woman are always of concern.

Where a woman is in labour the wellbeing of the woman and foetus is monitored continuously. This will include the strength, frequency and nature of uterine contractions, progress in labour and vaginal loss which may include amniotic fluid (liquor) or vaginal bleeding.

There is a risk of hypotension so hydration is important

Foetal concerns

The foetal heart rate is recorded and where foetal distress occurs this is indicated by changes in the foetal heart rate pattern. This is often referred to as a 'non-reassuring CTG' (cardiotocograph). With foetal blood sampling it is possible to check the blood gasses of the foetus and this may help determine if a caesarean section is required.

Caesarean section

Caesarean section is a surgical procedure which is frequently preformed on one person, the woman for the benefit of another, her baby. While there is usually no conflict and the woman will consent to the procedure, it should be recognised that the woman has an increased risk of morbidity following caesarean section in comparison to vaginal birth (Althabea & Belizán 2006, Villar et al 2006). It is important that the woman understands what is happening and consents to the procedure. She cannot legally be forced to have a caesarean section for a risk to the foetus (Dimmond 2002). In emergency situations where consent cannot be obtained, perioperative nurses are required to ensure that their practice is legal (Cornfield & Pomeroy 2008a, 2008b).

Caesarean sections may be elective or emergency (see table for classification). Non urgent elective caesarean sections are performed at 39 weeks gestation to reduce the risk of respiratory problems associated with earlier delivery (NICE 2004). Problems that arise in pregnancy that may lead to caesarean section include poor growth of baby (IUGR), antepartum haemorrhage (APH), pre-eclampsia (PET), or problems in labour such as presumed foetal distress, non progress, failed instrumental birth, malpresentations, umbilical cord prolapse, or uterine rupture. Current standards of care are that in emergency situations where there is a risk of maternal or foetal compromise the baby is removed from the uterus within 30 minutes of the decision being made (NICE 2004). Where a foetus is severely compromised 30 minutes will not improve outcomes but this standard is used as a guide for auditing maternity care.

1.	Immediate threat to the life of the woman and foetus
2.	Maternal or foetal compromise which was not immediately life threatening
3.	No maternal or foetal compromise but needs early delivery
4.	Delivery timed to suit woman and staff

Table: Classification of Caesarean Section (NICE 2004)

Many caesarean sections are preformed based on a judgment call by the obstetrician and in emergency situations preparations are rapid. This can be a frightening experience for parents, particularly where there are concerns for foetal or maternal wellbeing. The woman may also experience disappointment or a sense of failure at not achieving vaginal birth (Gamble & Creedy 2005).

Anaesthesia during pregnancy

Regional anaesthesia is recommended due to the risk of central nervous system depression which can affect the woman and her foetus. In emergency situations a general anaesthetic may be used but the infant should be delivered in 3-5 minutes to avoid respiratory depression. Skin preparation and insertion of catheter should be done prior to induction.

There are also concerns that the pregnant woman can inhale acid gastric secretions when laryngeal reflexes are absent. This is exacerbated by the reduced gastric motility caused by pressure of the uterus and a reduction in oesophageal tone. Prior to surgery antacids or H2 antagonists are administered (NICE 2004). Laryngeal oedema, associated with PET may also contribute to difficulties with intubation.

A regional anaesthetic lessens the impact on maternal and foetal physiology (NICE 2004) and has the additional benefit of enabling fathers to be present at the birth and the woman to hold her baby immediately afterwards. There is a risk of hypotension so hydration is important. If an epidural has been administered in labour consideration is given to the volume of intravenous fluids infused prior to surgery. Fluid overload may occur where the woman has PET due to the large amount of intercellular fluids that occur with this condition.

Preparation for caesarean section

The usual preoperative checks are preformed which may involve the availability of cross matched blood. Antacid therapy is provided, pubic hair removed from around the incision site and a urinary catheter inserted. A paediatrician, midwife or neonatal nurse should be in attendance to receive the baby.
Positioning of the pregnant woman
Aortocaval compression can occur in the supine position where pressure of the gravid uterus on the inferior vena cava and aorta leads to reduced venous return. This causes reduced cardiac output and stroke volume. The woman will feel faint while lying on her back but turning on her side quickly relieves this. To reduce aortocaval compression the pregnant woman is positioned with a slight tilt to the left.

Procedure

A range of techniques are used which include the Joel Cohen or Pfannensteil incision for a lower segment caesarean section (LSCS) (Tully et al 2002). This is the least muscular area. The technique minimises blood loss and postoperative pain and heals well. A longitudinal incision is not recommended due to the risk of uterine rupture in a future pregnancy. A vertical incision in the uterus may be required where the placenta is situated in the lower anterior wall of the uterus. It is possible to injure the baby when the uterus is opened.

Anatomical layers include the skin, fat, rectus sheath, muscle (rectus abdominus), abdominal peritoneum, pelvic peritoneum and uterine muscle. The amniotic sac is

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Continued

pricked (suction is required to remove liquor). The uterine incision may be extended by tearing. Depending on position of baby in the uterus, the baby may be extracted head first or by breech. Where a woman is in advanced 2nd stage of labour it may be necessary to insert a gloved hand into the vagina to help push up the presenting part to assist in the delivery. The baby is brought out through the abdominal incision. Suctioning of the mouth and nares may be required. The umbilical cord is clamped with two artery forceps and cut - the length is not important as it can be shortened later. The baby is given to the paediatric team before giving to the parents to hold if in good condition.

Once the baby is delivered, oxytocin may be administered intravenously to assist placental separation and uterine contraction thereby minimizing blood loss. The pelvic tilt can be discontinued. The placenta and membranes are removed using continuous cord traction and excess blood and clots are removed from the uterus and abdomen. The uterus is sutured in two layers, followed by the peritoneum, rectus sheath, fat and skin. Where a tubal ligation is planned this may be performed following uterine closure.

The placenta is examined for completeness. If not required for histology it can be disposed of safely. A blood sample from the umbilical cord can be saved for estimating the baby's Ph level, Hb, blood group or serum bilirubin if required.

Postoperative checks for the mother are as usual but it is important to observe that vaginal loss (lochia) is within the norm for birth. Where the baby is well, the mother and baby should be kept together; skin to skin care benefits mother-infant attachment and the establishment of breastfeeding (Saadeh & Akré 1996).

Specific situations

Umbilical cord prolapse can present as an obstetric emergency. Pressure from the cervix and foetal presenting part will impede blood flow to the foetus. Pressure from the umbilical cord can be relieved by placing the woman in the knee chest position with her pelvis tilted upwards. Avoiding vasospasm, the cord is gently placed inside the vagina. An assistant can protect the cord from pressure of the foetal head and cervix by placing fingers vaginally on the baby's head and pushing upwards to relieve compression. Alternatively compression can be relieved by filling the urinary bladder (RCOG 2008). This is particularly important where the woman is in labour and the uterus is contracting. The assistant's fingers must remain in place until the baby is delivered by caesarean section.

Complications of caesarean sections

With caesarean section there are risks of haemorrhage, infection, thrombosis, and bladder damage.

Haemorrhage is usually associated with uterine incision or placenta praevia. Closed wound suction drain can prevent haematoma or collection of fluid. Oxytocin is given to contract the uterus and aid placental separation.

Infection Prophylactic antibiotics may be prescribed where the woman has been in labour or where membranes have been ruptured prior to delivery (NICE 2004).

Thrombosis There is a risk of deep vein thrombosis (DVT) in pregnancy and postpartum due to haemostasis associated with pregnancy. Prophylactic anticoagulation may be warranted along with anti-embolic stockings and early postoperative mobilisation (NICE 2004).

Bladder damage Monitor urinary output and note any bleeding which could indicate damage to bladder or ureters.

Other long term complications include the impact of caesarean section on future pregnancy, including: placenta praevia, placenta accreta, uterine rupture and repeat caesarean section (RCOG 2001).

Care of baby at delivery

A paediatrician, midwife or neonatal team should be present to care for the infant particularly where difficulties are anticipated. An appropriately equipped preheated resuscitaire should be available with oxygen and suction attached. Masks and ET tubes should take into consideration the anticipated weight of the baby. Protective gloves are used until blood and amniotic fluid are removed. The infant is placed under the radiant warmer and dried thoroughly. Extreme preterm babies may be placed in a plastic bag for resuscitation, before drying the skin, to minimise cold stress (AAP 2006). Where the baby requires resuscitation this is instituted immediately and when stable the baby is transferred to appropriate neonatal facilities.

Where the baby is in good condition, wrap in a warm towel and give to mother or father to hold. The baby is under observation for the first hour after birth. To avoid chilling, skin to skin care will keep the baby close to the mother and temperature is maintained. Where the mother intends to breastfeed her baby this should be commenced in recovery. Aim to feed the baby within one hour of birth and always check with the mother before offering the baby formula milk.

Conclusion

This article has addressed some obstetric surgical procedures that may be required for women in pregnancy. The impact of an interrupted pregnancy, either due to early pregnancy loss or delivery by caesarean section will have a significant psychological impact on the woman that may have long term consequences. There are global concerns about the increasing numbers of caesarean sections and the long tem impact this has on women's wellbeing. This is not addressed in this article but follow up care of women will include a discussion around the events and decisions that were made and the implications for future pregnancies.

Surgery for the pregnant woman provides certain challenges but perioperative nurses and midwives, once aware of the issues involved, can develop the knowledge and skills required to provide appropriate and safe care.

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