



University of Nigeria

Virtual Library

Serial No	
Author 1	NWAGHA, U. I.
Author 2	OKARO, J. M.
Author 3	NWAGHA, T. U.
Title	Review: The Third Stage of Labour- A Time Bomb!!
Keywords	Third Stage of Labour, Post Partum Haemorrhage
Description	Review: The Third Stage of Labour- A Time Bomb!!
Category	Physiology
Publisher	Journal of College of Medicine
Publication Date	2004
Signature	

3

Review: The Third Stage of Labour-A Time Bomb!!

*U.I. Nwagha, *J.M. Okaro, **T.U. Nwagha

*Department of Obstetrics and Gynaecology, University of Nigeria Teaching Hospital, Enugu

**Kenekukwu Specialist Hospital, Enugu.

Correspondence to: Dr. Uchenna Nwagha, Department of Obstetrics and Gynaecology, University of Nigeria Teaching Hospital, Enugu, Nigeria. E-mail: Uchenwagha@yahoo.com

The third stage of labour can present with very serious complications which may lead to severe morbidity or mortality unless prompt and decisive action is taken. Post partum haemorrhage (PPH) is the commonest third stage complication and a leading cause of maternal mortality and morbidity in our environment. This review is aimed at revisiting the predisposing factors to post partum haemorrhage. It also emphasizes the prophylactic, immediate and further management of emergent

cases. Apart from refreshing our memories on the recent techniques of management where state of the art facilities are available, it also provides alternative non sophisticated methods that can be life saving.. Management of PPH in some religious sects like the Jehovah's witness and Faith healers are also highlighted.

Key Words: Third Stage of Labour, Post Partum Haemorrhage.

INTRODUCTION

The third stage of labour commences with the birth of the fetus or fetuses and ends with the complete expulsion of the placenta and membranes. After the delivery of the baby, both the patient and the medical attendant may have a false sense of security that all is well and safe. Unexpected and life threatening complications may therefore occur. These include, post partum haemorrhage (PPH), acute uterine inversion, neurogenic shock, anaesthetic complications, drug reactions, intra abdominal catastrophies like ruptured viscera or vessels, cardiovascular and respiratory complications. All these may proceed to post-partum collapse and unless prompt action is taken, severe maternal morbidity or even mortality may occur.

Post partum haemorrhage, in association with retained placenta, is the most common complication of the third stage of labour¹. It also remains the commonest cause of maternal morbidity and mortality in our environment.²⁻⁶ This situation requires early identification of risk factors, prophylactic treatment of all labours, prompt and decisive management of emergent situations. Our review will mainly concentrate on PPH.

POST PARTUM HAEMORRHAGE

Post partum haemorrhage is excessive blood loss from the genital tract after delivery of the baby. It is termed primary when it occurs within the first 24 hours of delivery and secondary when it occurs after 24 hours but within 6 weeks of delivery. The World Health Organization (WHO) defined primary post partum haemorrhage as blood loss of more than 500 ml in the first 24 hours of delivery⁷. In Nigeria, this value is accepted, but includes bleeding of any amount which worsens the constitutional state of the mother. However, in Australia and Zimbabwe, the minimum cut off value is 600 ml.^{1,8} When blood loss is visually estimated, as is often done in our environment, it has been shown that values obtained are inaccurate and observer-dependent⁹. As a result, the use of cholera

beds to estimate post partum blood loss has been proposed in developing countries.¹⁰ In developed countries, specialized methods like, using radio labeled red cells¹¹ and acid haematin extraction,⁹ have been advocated. Generally speaking, meticulous collection and measurement of shed blood can only achieve limited degree of accuracy.¹² Despite all efforts aimed at accurate determination, blood loss following delivery has been under estimated by 30-50% and can also be over estimated especially when less than 150ml¹³. As a result of these discrepancies, it has been suggested that minimum cut off levels should be 1000 ml.¹⁴ or should include significant fall in packed cell volume or need for blood transfusion, in the definition¹⁵ Primary post partum haemorrhage occurs in 3.7% to 8.6% of deliveries¹, but when defined in excess of 1000 ml, it occurs following 1.3% of all deliveries.¹⁶

Aetiological Consideration: Uterine atony remain the commonest cause of primary post partum haemorrhage.¹⁷ The inability of the uterus to contract leads to non-constriction of the vascular channels in the placenta bed. Excessive bleeding then occurs and the uterus is distended with blood, appearing as a "boggy" mass on abdominal palpation. Various factors have been implicated in aetiology of uterine atony. These include grand multiparity, primiparity, uterine overdistension (multiple pregnancy and polyhydramnios), induction of labour, prolonged deep anaesthesia, preeclampsia, previous history of PPH, associated uterine fibroid, and ante partum haemorrhage. Recent studies have observed that some of these factors like grand multiparity and induction of labour are no longer significant predictors of PPH.⁸ However these were observational studies without the use of multivariate analysis to exclude the effect of other associated variables, thus, conclusions generated were unreliable.¹⁸ Retained placenta and membranes on its own can cause PPH but commonly co-exists with uterine atony as failure to contract

effectively results in incomplete separation of the placenta. Retained placenta may be suspected when inspection of the placenta and membranes reveal a missing cotyledon. Retention of even a small fragment may be catastrophic. Occasionally this may not cause immediate bleeding. Lochia rubra continues after discharge and within two weeks, severe secondary PPH may occur. In placenta praecreta, where the chorionic villi invade deep into the myometrium, complete placenta separation will be impossible. This becomes more dangerous when there is associated placenta previa. The ineffectiveness of the lower segment's contraction, associated with incomplete placental separation, often leads to dangerous life threatening haemorrhage.

Bleeding may also occur from the genital tract following episiotomy or accidental trauma. Pregnancy induced hypervascularization makes bleeding from this area very profuse. The presence of a well contracted uterus when post partum-bleeding persists is highly suspicious of genital tract trauma. The vulva, vagina, rectum, cervix and uterus can be traumatized especially when destructive vaginal and instrumental vaginal deliveries (rotational forceps, vacuum application when cervix is not fully dilated) are performed. Mostly, the bleeding is revealed but can be concealed to cause haematoma formation. Infralelevator haematomas (vulvo vaginal) are usually visible while the supralelevator haematomas (broad ligament haematomas) are usually invisible and may present with no symptoms until shock develops. Acute uterine inversion and coagulation disorders are also important factors in the aetiology of primary post-partum haemorrhage.

Management of Third Stage of Labour: As the third stage of labour has been likened to a 'TIME BOMB', the best approach is to diffuse it before it explodes. Preventive measures are preferable to interventions. Anticipatory approach should be the rule. Identification of women at risk can thus not be over emphasized. Anaemia should be detected and corrected before the onset of labour. In labour, high risk patients should be on nil by mouth. Intravenous infusion with wide bore needle should be set up and at least two units of blood should be cross matched. Previously, expectant management of the third stage of labour which involves waiting for signs of placenta separation and allowing the placenta to be delivered spontaneously was employed. However, recently, it has been discovered that active management of the third stage of labour resulted in 62% reduction in the incidence of primary post partum haemorrhage.¹⁹ This involves the administration of prophylactic oxytocics after delivery of anterior shoulder or immediately after delivery of the baby, early cord clamping and cutting, then controlled cord traction to deliver the placenta. The choice of oxytocics depends on availability and practitioner's preference. Syntometrine (0.5mg ergometrine, plus 5.I.U. syntocinon) can be given either intravenously or intramuscularly. Most centres in our environment use intravenous or intramuscular ergometrine 0.5mg. However, intravenous syntocinon 10iu can be used when ergometrine is contra-indicated.

Studies have suggested that syntocinon alone is as effective as syntometrine^{20,21}, whereas others believe that syntometrine is more effective but has more side effects²² (nausea, vomiting, hypertension).

Management of Primary Post-Partum

Haemorrhage: During pregnancy, the blood flow to the uterus is increased by 20-30%²⁵. Thus massive obstetric haemorrhage can develop rapidly and could be life threatening. Management should therefore be prompt and accurate. Ideally, all obstetric units should have a blood bank on site and develop a local protocol for the management of massive haemorrhage. Since the commonest cause of primary PPH is uterine atony, the first thing to do when such cases are reported is to rub up the uterus to initiate contractions. This singular act may be enough to stop bleeding. If however bleeding continues, intravenous line should be set up with a wide bore needle (if not already in place). Intravenous ergometrine 0.5mg should be repeated if there are no contra indications. 40-100 units of oxytocin is added to 1 litre of dextrose saline. Physiological solutions like, ringer lactate and hartmans are better and should be used when available. Plasma expanders like haemacel or gelofusine can also be used. Dextran should be avoided due to its adverse effect on haemostasis. It is also important to note that blood should be taken for grouping and cross matching of at least 4 units of blood, coagulation profile can be determined at the same time. It may be necessary to inform the consultant anaesthetist and haematologists on call.

As attempts are made to control bleeding, the pulse, blood pressure, respiration, and urine output should be monitored. Where facilities are available, a pulse oximeter, ECG, and central venous pressure monitoring should be done. If bleeding continues despite all these, examination under anaesthesia with good lightening should be performed to rule out retained placenta and genital tract trauma. Retained products of conception should be manually removed, extreme care being taken to avoid perforation of the uterus. Sometimes it is difficult to completely evacuate the uterus especially when parts of the placenta are morbidly adherent to the uterus. In order to avoid over curettage and subsequent uterine synechia, and provided there is no continued haemorrhage, small remaining fragments of the placenta can be left *insitu*.¹⁸ Antibiotic cover and follow up should then be provided. Genital tract laceration should be adequately repaired. Cervical and upper vaginal lacerations are usually very troublesome due to poor accessibility. Tightly packing the vagina with sterile mops can minimize bleeding while preparations for repair are being made.

Infralelevator haematomas less than 5 cm in diameter and not expanding are managed conservatively with the use of ice packs and pressure dressing.²⁶ Infralelevator haematomas that are more than 5cm or rapidly expanding require surgical intervention. Supralelevator haematomas are managed conservatively with blood transfusion, antibiotics, analgesics and close monitoring. Exploratory laparotomy is however indicated when stable haemodynamic state cannot be

maintained. Care should be taken not to put blind sutures in the broad ligament to avoid injury to the ureters. Acute uterine inversion is an uncommon event. The best immediate management is replacement of the uterus by pressure from the vagina. Alternatively instilling warm normal saline into the vagina until hydrostatic pressure replaces the uterus can be done.²⁷ Leakage of saline from the vagina is prevented by keeping the fist in the vagina. A better seal can be produced by passing the saline through a silk cup ventouse extractor which is passed into the middle part of the vagina and held in place by hand.²⁸ If bleeding persists and, genital tract trauma, retained placenta, acute uterine inversion and bleeding disorders have been excluded, then diagnosis is most likely uterine atony, and further management is advocated.

Further Management of Atonic PPH:

(1) **MEDICAL MANAGEMENT:** When ergometrine and oxytocin have failed to achieve a well contracted uterus, intrauterine injection of 15 methyl prostaglandin F₂ alpha (Hamabate) via the anterior abdominal wall has proved to be successful.²⁹ This can also be administered intra muscularly but this produces severe diarrhea.³⁰ More recently, prostaglandin E₁ analogue (misoprostol) orally (600ug)^{24,31} rectally (800ug)³², and intrauterine (800 ug)³³ have been used with varying claims of success.

(2) **SURGICAL MANAGEMENT:** Surgical management is usually advocated when medical treatment has failed. It is better to start with the simple, non invasive surgical techniques before embarking on complex, invasive maneuvers. In order to reduce the rate of blood transfusion especially in this era of HIV/AIDS, it is advised, that if possible some of the simple surgical techniques can be applied synchronously with medical treatment. Compression of the aorta via the anterior abdominal wall to reduce blood supply to the uterus is simple, effective, and life saving.

(a) **Uterine tamponade procedures:** Bimanual uterine compression has proved very effective in controlling PPH, but it is very cumbersome because the practitioner may have to hold on to the uterus longer than he anticipated. Intrauterine packing is a traditional procedure which fell out of favour in the 1970s due to significant risk of infection and continual haemorrhage. However these problems have been successfully taken care of by the use of antibiotics and good technique.³⁴ The cervix is held firmly with sponge holding forceps as volsellum may cause significant trauma. Roll gauze is fed into the uterus over the operator's fingers and uniformly applied side to side, front to back and top to bottom. Usually several rolls of gauze are needed and can be joined together by knotting. Specially designed gauze tampons have been developed for this purpose.³⁵ Various success rates with uterine packing have been reported.³⁴⁻³⁷ Removal of the gauze within 24-36 hours is mandatory.³⁴ For easy removal, it has been suggested that the pack should be inserted into a plastic drape shaped as a big bag.³⁸ When adequate pressure cannot be achieved using gauze packs, specially designed ballons have proved successful.^{39,40} Where specially

designed ballons are not available, the use of gastric tube (sengstaken blake more tube)^{41, 42}; condom ballons^{43,44}, military anti shock trouser (MAST)⁴⁵, and foley catheter⁴⁶ have been reported with varying degrees of success. Uterine compression techniques using sutures (brace suture, B lynch sutures) is also highly effective in controlling atonic PPH.⁴⁷⁻⁴⁹

(b) **Uterine Devascularisation Procedures:** The use of vascular catheters and embolization of uterine arteries with gelfoam or 3mm metallic coils all aimed at reducing blood supply to the uterus have been very effective.⁵⁰⁻⁵² These procedures are however rarely done as they are limited by availability of specialized imaging equipment and trained interventional radiologist. Ligation of uterine arteries⁵³, and internal iliac arteries^{54,55}, have successfully been performed and proved effective in controlling haemorrhage and preserving reproductive function. In order to minimize blood loss and reduce maternal morbidity, vaginal uterine artery ligation has been advocated.⁵⁶

(c) **Hysterectomy:** When attempts to conserve the uterus and preserve reproductive functions fails, or when conservative measures are not available, hysterectomy should be performed as a life saving procedure. Undue delay by attempts to conserve the uterus should be avoided as this can lead to maternal death.³⁷ The quickest, safest intervention is subtotal hysterectomy. Attempts at total abdominal hysterectomy, especially when the cervix is fully dilated causes more bleeding and increased likelihood of damage to urinary system. It can also often be difficult to identify the junction between the cervix and the vagina when the cervix is fully dilated. If the placenta was low lying, bleeding from the cervical stump may occasionally continue but most of this will probably be controlled by direct pressure while the next step is considered. It is thus reasonable and advisable to perform a subtotal hysterectomy which will totally stop the bleeding or reduce it to the barest minimum. The remaining stump should be observed for further bleeding. The stump can then be removed when conservative measures fail to control the haemorrhage.

Control Of Intrapartum and Postpartum Haemorrhage at Caesarean Section:

Management of post partum haemorrhage at caesarean section is same as in spontaneous vaginal delivery. Additional blood loss from the incision site may however worsen events. Conservative measures to preserve reproductive function before resorting to hysterectomy is easier to apply.

Commonly encountered cause of PPH at caesarean section is placenta previa. Dangerous life threatening bleeding can occur when there is associated placenta accreta. Management of such cases should therefore be anticipatory. Previous endometrial damage has been identified as a risk factor in the development of placenta previa accreta⁵⁸. There is no doubt that routine ultrasonography is a contemporary tool in modern day obstetric practice, thus, antenatal placental localization especially when there is previous history of

endometrial damage should not be over emphasized. The potential need for a hysterectomy in cases of caesarean section for placenta previa is the main reason why such cases should whenever possible, be attended to by a clinician of considerable experience.

Before resorting to hysterectomy, conservative measures to preserve menstrual and reproductive function should be attempted. It is important to completely control the haemorrhage before closing the abdomen. Massive blood loss leads to some degree of disseminated intra vascular coagulopathy, thus leaving some oozings with the hope that they will stop, increases maternal morbidity, and may lead to mortality. Apart from the methods earlier described, practitioners in Asia have successfully, stopped intraoperative bleeding by modified suturing techniques. These include putting interrupted haemostatic circular stitches on the lower segment,⁵⁹ and approximating anterior and posterior wall of the uterus at the site of placental bed.⁶⁰ Although this may lead to increase in the incidence of uterine synechia, the authors reported rapid return of menstrual and reproductive function.

Obstetric Haemorrhage in Women who refuse Blood Transfusion:

Majority of women, accept blood transfusion if the clinical reasons for its necessity are fully and appropriately explained. A few women may however continue to refuse blood due to personal and religious reasons. The main group of women who may refuse blood for religious reasons are members of the Jehovah Witness sect, who believe that the Bible forbids the consumption of blood or blood components. Fear of contacting infections especially HIV/AIDS is another reason for refusing blood transfusion. A Jehovah witness will accept other kinds of medical treatment except blood. They believe that they are not exercising the right to die and are keen to cooperate with medical professionals, provided there will be no blood transfusion. They also do not try to stop others from having blood. The sect does not accept transfusion of whole blood, packed cells, white cells, plasma and platelets, but will be glad to receive IV colloids or crystalloids. They allow their members to individually decide on whether to take vaccines containing minor blood fractions; immunoglobulins, dialysis, intraoperative cell salvage, haemodilution and organ transplant.

Management of women refusing blood transfusion starts from the antenatal period. This group of women should be identified and noted. In a non confrontational manner, the risk of refusing blood transfusion should be explained. If she still refuses despite all this, she should be booked in a unit with all the facilities for prompt management of haemorrhage. All the discussions with the patient must be documented and informed consent obtained. Those with risk factors for PPH should be identified and noted. Antenatal anaemia should be promptly corrected. Senior members of the unit must be aware of such cases. When in labour, the consultant obstetrician should be informed. Labour should be managed by experienced staff and active management of the third

stage should be the rule. Those with identified risk factors, should have intravenous infusion while in labour and high doses of oxytocin added after delivery. Patient should not be left alone in the first hour after delivery. Majority of the labours will end without serious haemorrhage but when it occurs, prompt and decisive action should be taken. The threshold for intervention should be lower than in other patients. The consultant haematologist and anaesthetist should be informed. The patient should be informed about the events that are taking place. If standard treatment is not controlling bleeding, blood transfusion should strongly be recommended. Any patient is entitled to change her mind about a previously agreed treatment plan. If she maintains her refusal to accept blood, her wishes should be respected provided she is above 18 years of age. The medical staff must maintain a professional attitude and must not lose trust of the patient or her partner. It is however very distressing for staff to watch a woman bleed to death while refusing blood. If the woman dies despite all care, her relatives require support like any other bereaved family.

The first step to take when haemorrhage occurs in this group is to establish IV colloid infusion e.g. haemacel or Gelofusine. Blood pressure, pulse and urine output should be monitored. If possible consider a pulseoximetre or central venous pressure (CVP) line. Apply oxytocic, aortic and bimanual uterine compression and other measures earlier described. In addition fibrinolytic inhibitors, aprotinin⁶⁰ (trasylo) 2×10^6 u, followed by 500,000 u/hr. or tranexamic acid⁶¹ (cyklokapron) 1gm IV three times daily, can be used to control serious haemorrhage. Recombinant factor VIIa (Novoseven) 90 ug/kg which provides site specific thrombin generation has successfully been used to treat 5 reported cases of uncontrollable haemorrhage due to disseminated intravascular coagulopathy { DIC }⁶³ These agents are normally used in the management of disseminated intravascular coagulopathy (DIC) which can develop secondary to massive haemorrhage. The primary event of uterine atony causing PPH may have probably been taken care of by conservative measures.

Hysterectomy is normally the last resort whenever conservative measures fail. The threshold for hysterectomy should be lower than in other pregnant women and should be performed by a consultant obstetrician. Patient survival has been reported with Hb < 5g/dl.⁶⁴ After survival from massive obstetric haemorrhage, the aim should be to build the haemoglobin and restore iron stores. For severe anaemia, oxygen can be given. Erythropoietin 300 u/kg x 3 per week has also proved successful.⁶⁵ Iron supplementation is also essential. Intravenous iron sucrose (venofer) which is not associated with anaphylaxis, 200 mg x 3 per week is preferred.⁶⁶ Therapy can be augmented with vitamin B12 and folic acid. In life threatening anaemia hyperbaric oxygen therapy is an option.⁶⁷

Obstetric Haemorrhage in Faith Healers: The adherents of the faith healers include members of the Faith Tabernacle, Church of Christ scientists, Followers of Christ Church and the Church of first

born. Founders of these churches were at one time or the other healed of various ailments where medical treatment failed. Those Christian Scientists, respect the work of medical profession but choose prayers as treatment for themselves and their children rather than medicine because they have experienced prayers effectiveness many times in their lives. Most of these cases are rarely encountered by practitioners as they choose to deliver in churches and prayer houses and those with PPH suffer from severe morbidity and sometimes mortality. On very rare occasions, practitioners may encounter these faith healers with severe haemorrhage. The consequences of refusing medical treatment should be properly explained. The patient's confidence on the practitioner is very important. If however patient continues to refuse medical treatment, physical methods like, rubbing up the uterus, aortic compression, bimanual uterine compression and uterine tamponade should be used after proper explanation that these methods do not necessarily require administration of drugs. All discussions should be documented and informed consent obtained. Having done these, the practitioner should be satisfied that he has done his best within prevailing circumstances. Although it is very distressing to watch a patient die while refusing medical treatment, the law does not permit treatment without consent.

CONCLUSION

The third stage of labour can be very catastrophic and can rattle the ill prepared practitioner irrespective of experience. It can still occur despite active management of third stage of labour. The importance of developing a local protocol for management cannot be overemphasized. There is also an urgent need to train and re-train front line staff. Early detection of high risk cases, prophylactic management of all labours, prompt and decisive action in emergent situations will diffuse this "BOMB" before it detonates. Maternal mortality and morbidity is thus extremely reduced and our safe motherhood initiative will become a success story.

REFERENCES.

1. St. George L. Crandon A.J. Immediate post partum complications. *Aust. N.Z.J. Obstet. Gynaecol* 1990; 30: 52-56.
2. Adetoro O.O. Maternal Mortality - a 12 year survey at the University of Ilorin Teaching Hospital (UITH) Ilorin, Nigeria. *Int. J. Gynaecol. Obstet.* 1987; 25: 93-98.
3. Chukwudebelu W.O., Ozumba B.C. Maternal Mortality at the University of Nigeria Teaching Hospital Enugu. A 10 year survey. *Trop. J. Obstet. Gynaecol* 1988; 1: 23-26.
4. Akpala C.O. Ozumba B.C. Maternal mortality in a rural community in Northern Nigeria. *Orient. J. Med.* 1991; 3:168-171.
5. Aboyeji A. P. Trends in maternal mortality in Ilorin. *Trop J. obstet. Gynaecol* 1999; 16: 1-5
6. Anya A.E Anya SE. Trends in maternal mortality due to haemorrhage at the Federal Medical Centre Umuahia, Nigeria. *Trop J. obstet. Gynaecol.* 1999; 16: 1-5.
7. World health Organization (WHO). The prevention and management of post partum Haemorrhage. Report of a Technical working group. Geneva. WHO. 1990.
8. TSU V. D. Post partum Haemorrhage in Zimbabwe: a risk factor analysis. *Br. J. obstet Gynaecol.* 1993; 100: 327-33.
9. Brant H.A. Precise estimation of post partum Haemorrhage: Difficulties and importance. *Br. Med. J.* 1967; 1: 398-400.
10. Strand R.I. Da Silva F. Bergstrom S. Use of cholera beds in the delivery room: a simple and appropriate method of direct measurement of post partum bleeding. *Trop. Doctor;* 2003; 33 (4): 215-216.
11. Gahres E.E. Albert S.N. Dodek SM. Intra partum blood loss measured with Cr ⁵¹ tagged Erythrocytes. *Obstet. Gynaecol* 1962; 19: 455-62.
12. Gilbert L. Porter W. Brown V.A Post Partum haemorrhage: a Continuing Problem. *Br. J. Obstet. Gynaecol.* 1987; 94: 67-71.
13. Razvi K. Chuas. Arulkumaran S. Ratnam S. A comparison between visual estimation and laboratory determination of blood loss during the third stage of Labour. *Aus. N. Z. J. Obstet. Gynaecol.* 1996; 36: 152-154.
14. Drife J. Management of Primary Post partum haemorrhage. *Br. J. Obstet. Gynaecol.* 1997; 104: 275-277.
15. Roberts W.E. Emergent obstetric management of post partum Haemorrhage *Obstet. Gynaecol. Clin. N. AM.* 1995; 22: 283-302.
16. Stone RW Paterson CM. Saunders N. Risk factors for major obstetric haemorrhage. *Eur. J. obstet. Gynaecol. Reprod Biol* 1993; 48: 15-18.
17. Adetoro O.O Primary Post Partum Haemorrhage in a University Hospital in Nigeria. *West Africa. J. Med.* 1992; 11: 172-178.
18. Chien. P. F. W Third stage of labour and Abnormalities. In Dewhurst's Text book of obstetrics and Gynecology. 6th ed. Edmund D.K (Ed). 1999; 330-341
19. Prendiville W.J. Elbourne D. McDonald S. Active versus expectant management in the third stage of labour (Cochrane Review). In: The Cochrane Library. 2000: issue 4. Update soft ware Oxford.
20. McDonald S. J. Prendiville W. J; Blair E. Randomized controlled trial of Oxytocin alone versus Oxytocin and ergometrine in active management of Third stage of labour. *Brit. Med. J.* 1993; 307: 167-171
21. Soriano D. Dulitzim. Schiff E. et al A prospective cohort study of Oxytocin plus ergometrine compared with oxytocin alone for prevention of PPH. *Brit. J. obstet. Gynaecol.* 1996; 103: 1068-1073.
22. Mc Donald S. Prendiville WJ. Elbourne D. Prophylactic syntometine versus Oxytocin for delivery of placenta (Cochrane review). In: The Cochrane Library issue 4. 2000. Update software Oxford.
23. Thomas H. Jeffers T. M., Brazier J. M., Burt C. J. Barr. K. E. Does cord drainage of placenta blood facilitate delivery of the placenta?. *Aust. N.Z. J. obstet Gynaecol.* 1990; 30: 314-318.
24. El- Refacy H. O' Bien F. Morafa W. Walder J. Rodeck. Use of oral misoprostol in the prevention of post Partum haemorrhage. *Brit. J. obstet Gynaecol.* 1997; 104: 178-181.
25. Metcalf J. Romney S.L., Ramsey L.H. et al. Estimation of uterine blood flow in women at term. *J. Clin. Invest.* 1955; 34: 1632.
26. Zahn C.M. Yeomans ER. Post partum haemorrhage: Placenta accreta: uterine inversion and puerperal haematomas. *Clin. Obstet. Gynecol.* 1990; 33:422.
27. O' Sullivan J. V. Acute inversion of the uterus. *Brit. med. J.* 1945; 108: 541 - 542
28. Ogueh O. Ayida G. Acute uterine inversion. A new technique of hydrostatic replacement. *Brit. J. Obst. Gynecol.* 1997; 104: 951 - 952
29. Bigrigg A. Cnui D. Chissell S. Read M. D. use of intramyometrial 15 - methyl prostaglandin F₂ alpha to control atonic post partum haemorrhage following vaginal

- delivery and failure of conventional therapy. *Brit. J. Obst. Gynaecol.* 1991; 98:734 -736.
- 30.Chua S. Chew S. L. Yeoh C. L. et al. A randomized controlled study of prostaglandin 15- methyl F₂ alpha compared with syntometrine for prophylactic use in the third stage of labour. *Aust. N. Z. J. Obstet. Gynaecol.* 1995; 35: 413 -416.
- 31.Surberk D. V. Fehr P. M. Hosli I. Holzgreve W. Oral miso prostol for the third stage of labour: a randomized placebo. Controlled trial. *Obstet. Gynaecol* 1999;94:255 – 258.
- 32.Bamigboye A. A. Hofmeyr GJ, Merrell DA: Rectal miso prostol in the prevention of post-partum haemorrhage: a placebo controlled trial. *Am. J. Obstet. Gynecol.* 1998; 179: 1043 – 1046
- 33.Adekanmi O.A. Purmessur S. Edwards G. Barrington J. W. Intrauterine misoprostol for the treatment of severe recurrent haemorrhage. *Brit. J. Obst. Gyn* 2001; 108; 541 – 542.
- 34.Maier C R. Control of post partum Haemorrhage with uterine packing. *Am. J. Obstet. Gynaecol.* 1993;169: 317 – 321.
- 35.Robin G. F. Morgan M .A. Payne G. G. J. Wasemiller Smith. L. Iogothetopulos pack for the management of uncontrollable post partum haemorrhage. *A M. J. Perinatology* 1990; 7: 327 – 328.
- 36.Hester J. D. Post partum Haemorrhage and Re- evaluation of uterine packing. *Obstet. Gynaecol.* 1975; 45: 501 – 504.
- 37.Hsu S. Rodgers B. Lele A. Yeh J. Use of packing in obstetric haemorrhage of uterine origin *J. Rep. med.* 2003; 48(2): 69 – 71.
- 38.Wax J. R. Channell J. C. Vandersloot J. A. Packing of the lower uterine segment. A new approach to an old technique *Int. J. Gynaecol. Obstet.* 1993; 43: 197 – 198
- 39.Marcovici , Scoecia B. Post partum haemorrhage and intrauterine balloon tamponade. A report of three cases. *J. Rep. med.* 1999; 44: 122 -126.
- 40.Bakri Y. N. Amri A. Abdul J. F. Tamponade balloon for obstetrical bleeding. *Int. J. Gynaecol. obstet.* 2001; 74: 139 – 142.
- 41.Katesmark M. Brown R. Raju K S. Successful use of a Sengstaken – Blake more tube to control massive post partum haemorrhage. *Br. J. Obstet. Gynaecol* 1994; 101: 249 – 260
- 42.Johanson R. Kumar M. Obhrai M. Young P. Management of massive post partum haemorrhage: Use of a hydrostatic balloon catheter to avoid laparotomy. *Brit., J. Obst. Gynaecol.* 2001; 108 :420- 422.
- 43.Akhter S. Begur MR. Kabirz; Rashed M. Lada T. R. Zabeen F. Use of condom in the treatment of massive post – partum haemorrhage. *Med. Gen. Med.* 2003 ;5(3): 38.
- 44.Luijeadik R. W. Ijzerman's J. N. Jeckel J. Bruining H. A. An inflated condom as a packing device for the control of haemorrhage. *Br. J. Surg.* 1994; 8 (2): 270
- 45.Andrae B. Ericksson L. J. Skoo .G. G. Antishock trouser (MAST) and trans catheter embolization in the management of massive Obstetric haemorrhage – A report of two cases. *Acta. Obstet. Gynaecol.* 1999; 78(8); 740 – 741.
- 46.Bowen L. W. Beeson J. H. Use of foley catheter balloon in the control of post partum haemorrhage resulting from a low placenta implantation *J. Rep. med.* 1985; 30: 623 – 625.
- 47.B – lynch C. Coker A. Lawal A. H. et al. The B- lynch surgical technique for the control of massive post partum haemorrhage: an alternative to hysterectomy. Five cases reported. *Brit. J. Obstet. Gynaecol.* 1994; 104: 372 – 375.
- 48.Dacus J.V. Bubowski M. T. Bubowski. J. D. et al. Surgical treatment of uterine atony employing the B – lynch technique. *J. maternal –fetal medicine.* 2000; 9: 194 – 196.
- 49.Ferguson J E. Bourgeois F J, Under wood P. B et al. B- lynch suture for post partum haemorrhage. *Obstet. Gynaecol* 2000; 95: 1020 – 1022.
- 50.Lingam K. Hood V, Carty M. J. Angiographic embolization in the management of pelvic haemorrhage. *Brit. J. Obstet gynaecol.* 2000; 107: 1176 – 1178.
- 51.Deux J. F. Bazot M. le Blanche N. F. et al. Is selective embolization of uterine arteries a safe alternative to hysterectomy? *Am. J. Roetgenology.* 2001; 177: 145 – 149.
- 52.Badawy S-Z . Etman A. Singh M. et al. Uterine artery embolization: the role in obstetrics and Gynaecology. *Clinical imaging.* 2001, 25: 288 – 295.
- 53.O' leary J.A. Uterine artery ligation in the control of post-caesarean haemorrhage. *Journal of Reproductive medicine.* 1995; 40: 189-193.
- 54.Nandanwar Y. S. Thalman L. Mayadeo N. Guttal D. R. Ligation Of internal iliac arteries for the control of pelvic, haemorrhage. *J. post. Grad. Med* 1993; 39: 194 – 196.
- 55.Das B.N. Biswas A , K. ligation of internal iliac arteries in pelvic haemorrhage. *J. Obstet. Gynaecol. Research.* 1998. 24: 251 – 254.
- 56.Hebisch G. Huch A. Vaginal uterine artery ligation to avoid high blood loss and puerperal hysterectomy in PPH. *Obstet. Gynaecol.* 2002;100(3). 574 -578
- 57.Anonymous. Report on confidential enquiries into maternal deaths in the United Kingdom. (1994 -1996). The stationery office. 1999: London.
- 58.Clark S.L. Koonings P.P. Phelan J. P. etal. Placenta previa/ accreta and prior caesarean section. *Obst. Gynaecol.* 1985;66: 89 – 92.
- 59.Cho J. Y. KIM S. T. Cha K. Y. KAY C. W., KIM. M. I., Cha. K.S. Interrupted circular Sutures: Bleeding control during caesarean delivery in Placenta previa accrete. *Obstet. Gynaecol.* 1999; 78: 876 – 879.
- 60.Cho J. H. JUN. HS. Lee C.N. Haemostatic suturing Technique for uterine bleeding during caesarean delivery. *Obstet. Gynaecol.* 2000. 96;129 – 131
- 61.Valentine S., Williamson P. Sutton D. Reduction of acute Haemorrhage with Aprotinin. *Anaesthesia.* 1993; 48: 405 – 408
- 62.Alok K. A. Hagen P., Webb J. B. Tranexamic acid in the management of post partum haemorrhage. *Brit. J. obst. Gynaecol.* 1996; 1250 – 1251
- 63.Moscardo F. Successful treatment of severe intra abdominal bleeding associated with disseminated. Intravascular coagulation using recombinant activated factor VIIa. *Brit J. Haematol*, 2001; 133: 174 – 176.
- 64.Reid M. F., Nohr K. Birks R. J. S., Eclampsia and haemorrhage in a Jehovah's Witness. *Anesthesia.* 1986; 41: 324 – 325.
- 65.Breyman C. Richter C. Huttmr C. Huch A. Effectiveness of recombinant erythropoietin and Iron sucrose Vs Iron therapy only in patients with post partum anaemia and blunted erythropoiesis. *Europ. J. Clin. Invest.* 2000.30: 154 – 101
- 66.Buscutilil D. Copplestone A. Management of blood loss in Jehovah's Witness. *B. M. J.* 1995; 311: 1115 – 1116
- 67.McLoughlin P. L. Cope T. M. Hamson J.C. Hyperbaric Oxygen therapy in the management of severe anaemia in a Jehovah's Witness. *Anesthesia.* 1999; 54: 891 - 895