

**EMERGENCY OBSTETRIC HYSTERECTOMY A
RETROSPECTIVE ANALYTICAL STUDY OVER PAST 10
YEARS**

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BONAFIDE CERTIFICATE

This is to certify that the dissertation titled “**EMERGENCY OBSTETRIC HYSTERECTOMY A RETROSPECTIVE ANALYTICAL STUDY OVER PAST 10 YEARS** ” is the original work done by **Dr. uma maheswari**, postgraduate in the Department of Obstetrics and Gynaecology, Institute of Social Obstetrics and Government Kasturiba Gandhi Hospital, Madras Medical College, Chennai to be submitted to The Tamilnadu Dr. M.G.R. Medical University, Chennai-600032, towards the partial fulfillment of the requirement for the award of M.D. Degree in Obstetrics and Gynaecology, March 2010. The period of study is from July 2008 to October 2009.

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*****INTRODUCTION*****

INTRODUCTION

Obstetrics is a bloody business. Even though the maternal mortality has been reduced dramatically by hospitalization for delivery and the availability of blood for transfusion, death from haemorrhage remains prominent.

Obstetrical haemorrhage is most likely to be fatal to mother in circumstances in which blood and blood components are not available immediately. The establishment and maintenance of facilities that allow prompt administration of blood are absolute requirement for acceptable obstetrical care.

Hysterectomy was originally employed in Obstetrics a hundred years ago as a surgical attempt to manage life threatening Obstetrical haemorrhage and infection. Now a day it is generally performed as a life saving procedure in cases of rupture uterus, resistant PPH, morbid adhesion of placenta and uterine asepsis. On one hand it is used as a last resort to save a mother's life. On the other hand a women's reproductive capability is sacrificed.

It is pathetic to perform an emergency hysterectomy on a young primi especially when the baby is dead or moribund. Often it is a difficult decision and requires a good clinical judgement.

More often it needs to be carried out when the mother's condition is too critical to withstand the risks of surgery and anaesthesia. Performing an emergency hysterectomy on a vascular gravid uterus often distorted due to rupture needs expertise.

The maternal outcome greatly depends upon the timely decision, the

surgical skills and the speed of performing.

The most common indication for emergency procedures is severe uterine hemorrhage that cannot be controlled by conservative measures. Such hemorrhage may be due to an abnormally implanted placenta (eg, placenta accreta), uterine atony, uterine rupture, coagulopathy, or laceration of a pelvic vessel. The relative frequency of these conditions varies among series and is dependent upon the patient population and practice patterns.

Planned hysterectomy at the time of delivery is a controversial procedure because of the increased morbidity related to surgery on the highly vascular pelvic organs. It has been advocated for parturients with gynecologic disorders such as leiomyomas or high-grade cervical intraepithelial neoplasia, but in these cases surgery usually can be safely delayed until the pelvis returns to its prepregnant state]. Peripartum hysterectomy may also be scheduled for patients with early invasive cervical carcinoma, which can be managed by radical hysterectomy following a planned cesarean delivery, and for those with uterine infection unresponsive to postpartum antibiotic.

A sequence of conservative measures to control uterine hemorrhage should be attempted before resorting to more radical surgical procedures. If an intervention does not succeed, the next treatment in the sequence should be swiftly instituted. Indecisiveness delays therapy and results in excessive hemorrhage. Moreover, there is a relationship between the duration of time that passes prior to deciding to perform the hysterectomy, the amount of blood loss, and the likelihood that the hysterectomy will be seriously complicated by coagulopathy, severe hypovolemia, tissue hypoxia, hypothermia, and acidosis, which further compromise the patient's status. Timing is critical to an optimal outcome: hysterectomy should not be performed too early or too late.

In the past, most cases of intractable PPH followed vaginal delivery and

were due to uterine atony. However, more recent case series and national databases show that more cases are now associated with cesarean delivery. Cesarean delivery for placenta previa carries a relative risk of 100 for peripartum hysterectomy, with many patients having a diagnosis of placenta accreta.

A recent systematic review examined various techniques used when medical management is unsuccessful. These included arterial embolization, balloon tamponade, uterine compression sutures, and iliac artery ligation or uterine devascularization. At present, no evidence suggests that any one method is more effective for the management of severe PPH. Randomized controlled trials of the various treatment options may be difficult to perform. Balloon tamponade is the least invasive and most rapid approach and may thus be the logical first step

******AIM OF THE STUDY******

AIM OF THE STUDY

Hysterectomy performed at or following delivery may be life saving if there is severe obstetrical haemorrhage. Emergency Obstetrical Hysterectomy remains an essential weapon in any Obstetrician's armoury. Hence it is important to know the general indices, changing trends and indications of this weapon.

Hence these are major indications for emergency Obstetric Hysterectomy. In my study it includes Hysterectomy following resistant atonic PPH, ruptured uterus and placenta accrete. It includes Hysterectomy for lower segment bleeding associated

with uterine incision, placental implantation or laceration of major uterine vessels also. Hysterectomy following both vaginal delivery and Caesarean section are included.

Hysterectomy for large symptomatic myomas, septic abortion, hydatiform mole, carcinoma cervix, Carcinoma endometrium are excluded from my study. Hysterectomy in early pregnancy for non-Obstetrical indications are also excluded. **KEEPING THIS IN MIND THAT THE PRESENT STUDY WAS UNDERTAKEN WITH AN AIM TO EVALUATE THE INCIDENCE, MATERNAL PROFILE, INDICATIONS ,TYPE ,NO OF TRANSFUSIONS, MATERNAL OUTCOME AND HOW THEY ARE BEHAVING OVER PAST 10 YEARS (2000-2009) IN OUR INSTITUTION.** Emergency postpartum hysterectomy is associated with significant blood loss, need for transfusion, postoperative complications and longer hospitalization partly because of its indications.

******HISTORICAL REVIEW******

HISTORICAL REVIEW

Joseph Cavallini (1768) was the first to propose the idea of removal of uterus at the time of Caesarean section. In 1869 Horatia Stores did the first documented Caesarean hysterectomy in human beings. He did a sub-total hysterectomy, cauterized the stump and fixed it to the abdominal wound. The patient expired on 4th Post Operative day.

In 1876 Edward Porro from Pavia was the first to do a successful Caesarean Hysterectomy in human beings. Porro's patient Julia Cavallini was an elderly dwarf primi with severely contracted pelvis. He did a primary section and then sub-total Hysterectomy using the same technique as Stores. Both mother and child survived.

Porro's famous memoir entitled 'Della Amputazione Utero Ovarica Complimento de Faqlio Caesariana' published in 1876. This paper stimulated world wide interest in Hysterectomy at the time of Caesarean Section. The first successful Caesarean Section Hysterectomy in the United States was performed by Richardson in 1881.

The turning point in the evolution of Caesarean Section operations came in 1882 when Sanger introduced suturing of the uterine incision.

In 1890 Reed of USA outlined the following indications:

- (i) When Caesarian is indicated and removal of uterus required
- (ii) When foetus is dead and gross uterine sepsis present
- (iii) Extensive atresia of vagina
- (iv) Cancer of cervix
- (v) Atonic PPH
- (vi) Ruptured uterus

Early studies on peripartum Hysterectomy included Hysterectomy done for non-emergent conditions and between 1950's and 1970's Caesarean Section

Hysterectomy was most commonly used for sterilization, defective uterine scar, myoma and other gynaecologic disorders. Since the 1980's indications for peripartum hysterectomy have been restricted to emergency situations.

TABLE 2 -- Peripartum hysterectomy indications per decade

Decade	Cases: known indication (n)	Hemorrhage	Rupture	Accreta	Placenta Previa	Cancer	Elective	Other
1966-1975 (%)	148	24	41	5	6	1	14	14
1976-1985 (%)	98	48	26	8	5	1	4	8
1986-1995 (%)	31	41	3	24	13	16	0	3
1996-2005 (%)	43	30	9	47	12	0	0	2
1966-2005 (n)	320	108	90	43	24	8	24	23
Comparison of 1966-1975 with 1996-2005		<i>P</i> = .24	<i>P</i> < . 0001	<i>P</i> < . 00001				

LITERATURE*** ******REVIEW OF**

REVIEW OF LITERATURE

Adesiyun Adebisi Gbadeb et al of Nigeria done retrospective analysis of twenty two patients that had inevitable peripartum hysterectomy (IPH) during the study period of 4 years, July 2001 to June 2005. According to them the mean age of the patients was 32.4 years with a range of 18 to 47 years. The parity ranged from 1 to 9. The parity distribution was positively skewed indicating the rate of IPH increased with parity. Sixteen (72.7%) patients did not have antenatal care and 21(%) out of the 22 patients were referred from other health facilities. Indications for IPH were ruptured uterus in 16(72.7%) patients, uterine atony in 4(18.2%) patients.

Of the 22 patients, 15 (68.2%) delivered per abdomen while 7(31.8%) delivered per vagina. Subtotal hysterectomy was the most commonly performed type of hysterectomy in 17(77.5%) of the cases. High maternal mortality of 59.1% and perinatal mortality of 77.3% was recorded in the study. Ruptured uterus which is associated with poor pre-surgical clinical state was the leading indication for peripartum hysterectomy in this study. This may be responsible for the high maternal and fetal mortality recorded in this study and not necessarily the hysterectomy procedure itself.

. Suchartwatnchai et al did a study on emergency hysterectomy. Results were that hysterectomy was performed on 121 women at Ramathibodi Hospital, Bangkok, between 1969 and 1987, an incidence of 1:875 deliveries. Of 88 women whose records were available, 91% had emergency hysterectomy, with uterine atony as

the most common indication (32.5%), followed by placenta accreta (26.2%), uterine rupture (10.0%), extension of cervical tear to the lower uterine segment (8.7%), broad ligament hematoma (6.2%) and placenta previa (5.0%). The intraoperative and postoperative problems included febrile morbidity (52%), intraoperative hypotension (41%), and disseminated intravascular coagulation (5.7%). Late complications included Sheehan's syndrome (3.4%), post-transfusion hepatitis (2.3%), hematoma (2.3%) and wound infection (2.3%)

Yaw-Ren Hsu et al of Taiwan done a study to identify risk factors for and sonographic findings, complications and outcomes of emergency peripartum hysterectomy due to placenta previa/ There were 16 cases of emergency peripartum hysterectomy due to placenta previa/accreta (0.6/1,000 births). The mean hospitalization time was 8 days (range, 5–24 accreta.

There were 16 cases of emergency peripartum hysterectomy due to placenta previa/accreta (0.6/1,000 births). The mean hospitalization time was 8 days (range, 5–24 days) and the mean operation time was about 150 minutes (range, 85–335 mins). The estimated mean blood loss was 3,800 mL (range, 2,700–12,000 mL) and the mean amount of whole blood transfused was 15 units (range, 10–38 units) The association of placenta previa and prior cesarean delivery with placenta accreta and emergency peripartum hysterectomy is well documented by their study

Karen et al of Newyork analyzed retrospectively 47 of 48 cases of emergency peripartum hysterectomy performed at Winthrop-University Hospital from 1991 to 1997. There were 48 emergency peripartum hysterectomies among 34,241 deliveries for a rate of 1.4 per 1000. Most frequent indications were placenta accreta

(48.9%, 12 with previa, 11 without previa), uterine atony (29.8%). Placenta accreta was the most common indication in multiparous women (58.8%, 20 of 34), uterine atony the most common in primiparas (69.2%, nine of 13). Twenty-two of 23 (95.6%) women with placenta accreta had a previous cesarean delivery or curettage. The number of cesarean deliveries or curettages increased the risk of placenta accreta proportionally. Thirty-eight (80.9%) of the hysterectomies were subtotal. Postoperative febrile morbidity was 34%; other morbidity was 26.3%.

If the combination of risk factors and imaging findings is highly suggestive of placenta accreta, then, a cesarean hysterectomy should be planned, as there is reduced maternal morbidity and mortality when taken up electively.

George Daskalakis et al of Athens analysed medical records of 45 patients who had undergone emergency hysterectomy for 1997 to 2004 were scrutinized and evaluated retrospectively. Maternal age, parity, gestational age, indication for hysterectomy, the type of operation performed, estimated blood loss, amount of blood transfused, complications, and hospitalization period were noted and evaluated. The main outcome measures were the factors associated with obstetric hysterectomy as well as the indications for the procedure.

During the study period there were 32,338 deliveries and 9,601 of them (29.7%) were by cesarean section. In this period, 45 emergency hysterectomies were performed, with an incidence of 1 in 2,526 vaginal deliveries and 1 in 267 cesarean sections. All of them were due to massive postpartum hemorrhage. The most

common underlying pathologies were placenta accreta (51.1%) and placenta previa (26.7%). There was no maternal mortality.

Emergency peripartum hysterectomy: a comparison of cesarean and postpartum hysterectomy was done by FATU FARNA et al of America. There were 55 cases of emergency peripartum hysterectomy (38 cesarean hysterectomies, and 17 postpartum hysterectomies), for a rate of 0.8 per 1000 deliveries. Overall, the most common indication for hysterectomy was uterine atony (56.4%), followed by placenta accreta (20.0%).

Average estimated blood loss was 3325.6 ± 1839.2 mL, average operating time was 157.1 ± 75.4 minutes, average time from delivery to completing the hysterectomy was 333.8 ± 275.7 minutes, and the average length of hospitalization was 11.0 ± 7.9 days. The cesarean delivery rate at Grady Memorial Hospital during the study period was 14.2%. There were no statistically significant differences between variables examined when comparisons were made by cesarean vs postpartum hysterectomy.

Study by Yammato et al of Thailand was to review cases of emergency postpartum hysterectomies performed in the setting of life-threatening hemorrhaging. A retrospective study of 17 patients who underwent postpartum hysterectomies during January 1, 1985-December 31, 1998 was undertaken by them. The incidence was 1 in 6,978 deliveries (0.014%).

All patients were transported from affiliated clinics. The leading

cause for a hysterectomy was uterine rupture (35.3%), followed by disseminated intravascular coagulation (DIC) due to placental abruption (29.4%), and uterine atony (23.5%). Failure of internal iliac-artery ligation occurred in 7 patients.

Internal iliac artery ligation is not effective for patients with massive blood loss. In such cases, it is desirable for the private physician to make an early decision.

B. Chanrachakul, et al of Thailand done a retrospective study of all cases of cesarean and postpartum hysterectomy during 1985–1994. Maternal characteristics, method of delivery, indications for hysterectomy and complications were reviewed. Their results were such as rate of cesarean and postpartum hysterectomy was 1:1667 deliveries. Half of these cases were delivered by cesarean section. The main indications for hysterectomy were massive bleeding due to uterine atony, abnormal placental adhesions or uterine rupture. Maternal morbidity was high and there was one maternal death

Study by N. Yaegashi et al 2000 proves that the combination of prior cesarean section and placenta previa is an especially ominous risk factor for emergency postpartum hysterectomy and life-threatening bleeding following placental removal

Wong WC et al of HONG KONG did a study in which obstetric patients who had undergone emergency hysterectomies in between 15 October 1993 and 31 December 1997 were reviewed retrospectively. There were 15,474 deliveries

and 7 emergency obstetric hysterectomies. All cases had total abdominal hysterectomy. The indications for hysterectomy were uterine atony and placental disorders. : Emergency obstetric hysterectomy remains a potentially life-saving procedure in unavoidable catastrophe. The 7 patients with life threatening postpartum haemorrhage underwent hysterectomy after failure of conservative measures. The morbidity is low and there was no mortality in this series.

According to Deborah A. Gould et al ten women underwent obstetric hysterectomy at St George's Hospital, London between 1992 and 1998, with an apparent seven-fold increase in incidence in recent years. All hysterectomies were performed as emergency procedures, with massive postpartum haemorrhage being the major indication for operation in nine cases. Abnormal placentation was the single commonest cause, seven cases being associated with previous caesarean section. There were no maternal or fetal mortalities, but major surgical complications.

8-YEAR REVIEW AT TAIF MATERNITY HOSPITAL, IN SAUDI ARABIA was done et al by Afaf RA Alsayali et al. In this study, we reviewed all the available notes of obstetric hysterectomies (25 cases) performed at the Taif Maternity Hospital (TMH) between 1990 and 1998. We compared this with 25 cases of patients who had had at least their third CS operations during the data collection period. There were 29 cases of emergency hysterectomy (25 reviewed) during the eight years, giving an incidence of 1/2559 births (total births were 74,200) All patients of the hysterectomy group required blood transfusion, and 17 were transfused with 4 units of blood or more. A procedure duration of three hours or more and a hospital stay of >11 days were significantly higher in the hysterectomy group.

The incidence of placenta previa was also significantly higher in patients of the hysterectomy group compared to patients with repeated CS that did not end in hysterectomy. The rate of major complications (48%) was significantly higher in the study group. There were two maternal deaths in the hysterectomy group, giving an incidence of 8% for this procedure.

The most significant emerging trend was the increase in the incidence of peripartum hysterectomy as a result of morbidly adherent placenta.

Although our incidence of peripartum hysterectomy has decreased over the decades, the incidence of peripartum hysterectomy that occurred with a history of previous CS has increased significantly. This is a consistent finding in recent literature, with a range from 18.8-60.5%.

Eniola et al found that the most important risk factor in their study series was the performance of CS in the index pregnancy, which occurred in 68% of cases. Forna et al found a 10-fold increased risk of PH in cases with a history of CS.

Knight et al showed that the associated risk of PH also extends beyond the initial CS into subsequent deliveries; women who have had 1 previous CS have more than double the risk of PH in the next pregnancy and women who have had ≥ 2 previous CSs have > 18 times the risk. The association between the rising CS rate and incidence of PH with a history of CS is attributable mostly to the occurrence of morbidly adherent placenta.

Another trend that was observed was the marked decrease in the incidence of elective PH procedures. Early studies on PH included hysterectomies that were done for nonemergent conditions; between 1950 and the late 1970s, cesarean hysterectomy was performed most commonly for sterilization, defective uterine scarring, myoma, and other gynecologic disorders. Karen M Flood et al study found that, between 1966 and 1975, elective procedures accounted for 14% of cases of PH with similar indications. In all the 6 cases in which sterilization was cited as an indication, there were concomitant issues such as menorrhagia and there was controversy in early studies regarding the justification of performing elective procedures for sterilization without the presence of coexisting disease.

The incidence of “elective” procedures fell to 4% the next decade, and there were no reported cases between 1986 and 2005. More recently indications have been restricted to emergent situations or elective cancer cases. Sago et al recently reevaluated the role of elective peripartum hysterectomy in situations in which repeated CS is required in the presence of a valid gynecologic reason for concomitant uterine extirpation. They emphasize the associated low morbidity, the cost effectiveness, and the opportunity for residents to learn the operation with supervision and under controlled circumstances

We also found a significant downward trend in the incidence of uterine rupture as the indication for PH. Uterine rupture featured more significantly in the earlier decades, similar to findings of older studies of the incidence of PH. This significant decrease over the decades is most likely the result of changes in modern obstetric practice with decreased parity of women, the more judicious use of oxytocin,

and the avoidance of trials of labor in the setting of previous classic CS; however, data to support these assumptions are limited.

Hemorrhage/atonny has remained a significant indication for PH, as evidenced in recent literature; however, the number of cases has decreased relatively over the decades. This is most likely due to increased success of treatment with uterotonic agents, prostaglandins, embolization, uterine catheters, and surgical procedures such as the B-Lynch technique or selective devascularization.

There is often debate regarding the benefits of subtotal vs total hysterectomy. Indeed, subtotal hysterectomy may not always be sufficient to abate the hemorrhage, especially from the cervical branch of the uterine artery. However, other studies have shown that there is no difference in blood loss or transfusion rates when comparing total vs subtotal procedures. Arguments for the performance of subtotal hysterectomies include findings of less operation time required and a reduced hospitalization period.

Fortunately, the number of cases of PH has decreased over the years. Despite this finding, we are concerned that, with the worldwide increase in CS rates, there will be a significant domino effect involving increased deliveries after CS and increased morbidly adherent placental cases. The trend in our study is reflective of this, and there is a concern that there will be a rise in the number of obstetric hysterectomies required in the future because of placenta accreta alongside significant maternal morbidity.

Uterine rupture is perhaps one of the most feared intrapartum complications encountered by obstetricians. This catastrophic complication occurs most often in women attempting a vaginal birth after a prior cesarean delivery (VBAC). In women who undergo a trial of labor after one prior low transverse cesarean section, the incidence of uterine rupture is estimated to be less than 1%, whereas a trial of labor may be successful 60% to 80% of the time, depending on the indication for the initial cesarean section.

Although the rate of uterine rupture is highest among women who are attempting a trial of labor, one must remember that there is an inherent risk of uterine rupture associated with a uterine scar. This risk is estimated as being between 0.0 and 0.16%. The rate of cesarean delivery continues to rise, reaching an all-time high of 30.2% in 2005, a 46% increase since 1996. Thus, more women are entering subsequent pregnancies at increased risk for uterine rupture, whether or not they attempt a VBAC.

Rupture of the unscarred uterus

Although most uterine ruptures are associated with a trial of labor in a patient who has had a prior cesarean section, rupture of the nulliparous uterus is also possible. Spontaneous uterine rupture is an extremely rare event, estimated to occur in 1 of 8000 to 1 of 15,000 deliveries. A recent review article by Walsh and colleagues gives an excellent overview of the etiology of rupture of the primigravid uterus.

Uterine rupture has been reported in women who have uterine anomalies secondary to a history of diethylstilbestrol exposure as well as bicornuate

uteri. Maternal connective tissue disease, in particular Ehlers-Danlos syndrome, also has been associated with uterine rupture. Labor induction and augmentation with various agents also have been associated with rupture of the unscarred uterus. Another risk factor that has been associated with rupture of the unscarred uterus is abnormal placentation. The incidence of placenta accreta without a prior cesarean section or placenta previa has been estimated at 1 in 68,000. Although these events are rare, clinicians must remember that uterine rupture is a possibility in any laboring patient who exhibits abdominal pain, hypovolemia, and fetal compromise

Uterine rupture in the primi gravid patient: prior uterine surgery

In the most recent review of cases of uterine rupture, 31% of uterine ruptures occurred in women who had a history of prior uterine surgery, including myomectomy. Classic teaching states that the risk of rupture is increased only if the uterine cavity is entered during myomectomy. Thus, women who have undergone removal of pedunculated or subserosal myomas are assumed to be at no increased risk of uterine rupture during subsequent pregnancies. Cases of uterine rupture, however, have been reported after laparoscopic myomectomy, the most common procedure used to remove pedunculated and subserosal myomas.

In fact, 36% of the cases of uterine rupture that occurred following a prior uterine surgery occurred after a laparoscopic myomectomy. A proposed explanation for this seemingly high rate of rupture following a laparoscopic procedure is that the suturing technique used in laparoscopic myomectomy is inferior to myomectomy site closure during an exploratory laparotomy. Other studies have

reported that the risk of uterine rupture after laparoscopic myomectomy is no higher than 1%, but a large percentage of these patients underwent elective cesarean section, thus minimizing risk. A recent study reports a success rate of 83% in women attempting a vaginal delivery after laparoscopic myomectomy. All of these labors were managed as VBAC attempts, and there were no cases of uterine rupture. These data suggest that although uterine rupture is rare following laparoscopic myomectomy, it can occur, sometimes years after the procedure. To be most conservative, perhaps induction and augmentation of labor in women who have a history of laparoscopic myomectomy or laparotomy for pedunculated or subserosal myomas should be managed in a similar manner as VBAC attempts.

Uterine rupture during a trial of labor remains a rare event, with an estimated occurrence of approximately 0.7% in women who have had one prior low transverse uterine incision. If a uterine rupture occurs, it can have catastrophic consequences for both mother and fetus. Clinicians need to assess each individual patient's risk of rupture during the informed consent process. Important variables to consider include prior uterine surgery, the indication for the prior cesarean section, type of prior uterine incision, type of uterine closure, maternal age, maternal obesity, gestational age of prior cesarean section, interpregnancy interval, prior successful vaginal delivery, prior successful VBAC, and estimated fetal weight.

For women who have had a prior classical incision, delivery between 36 and 37 weeks with or without amniocentesis seems reasonable. It remains

to be seen if antepartum assessment of the uterine scar by ultrasound will give clinicians an objective measure of a patient's risk of uterine rupture in a trial of labor.

When a woman decides to attempt a trial of labor after a prior cesarean section, the obstetrician must pay close attention to the potential intrapartum predictors of uterine rupture, including moderate and severe variable decelerations in the fetal heart rate, especially when seen in association with persistent abdominal pain. Data suggest that increased exposure to oxytocin may increase the risk of uterine rupture. Overall risk of maternal and perinatal morbidity is low with a trial of labor, although it is increased with a failed trial of labor.

Perhaps over time more intrapartum factors will be found to be reliable predictors of uterine rupture. Alternatively, it may become possible to predict uterine rupture based on a patient's antepartum risk factors. Currently, there are no methods labor should be selected based on antepartum criteria. This selection process should include appropriate counseling and informed consent. Although the overall incidence of uterine rupture during a trial of labor is low, vigilance and maintaining a high index of suspicion for uterine rupture are crucial when managing a patient with a history of a prior cesarean section.

Emergency hysterectomies were associated with longer operating times ($P < 0.0001$), greater blood loss ($P < 0.0001$), more transfusions ($P < 0.001$), postoperative complications ($P < 0.01$), secondary surgeries ($P < 0.01$) and longer hospitalizations ($P < 0.001$) than cases of emergency cesarean section.

Zelop et al of Boston has done a retrospective study. From the obstetric records of all deliveries at Brigham and Women's Hospital between Oct. 1,

1983, and July 31, 1991, we identified all women undergoing emergency peripartum hysterectomy, calculated crude and adjusted incidence rates, conducted statistical tests of linear trends and heterogeneity, and observed the clinical indications preceding the onset of this procedure. There were 117 cases of peripartum gravid hysterectomy identified during this period, for an overall annual incidence of 1.55 per 1000 deliveries.

The rate increased with increasing parity and was significantly influenced by placenta previa and a history of cesarean section. The incidence by parity increased from one in 143 deliveries in nulliparous women with placenta previa to one in four deliveries in multiparous women with four or more deliveries with placenta previa. Likewise, the incidence increased from one in 143 deliveries in women with one prior live birth and a prior cesarean section to one in 14 deliveries in multiparous women with four or more deliveries with a history of a prior cesarean section.

Both these trends were highly significant ($p < 0.001$). Abnormal adherent placentation was the most common cause preceding gravid hysterectomy (64%, $p < 0.001$), with uterine atony accounting for 21%. Although no maternal deaths occurred, maternal morbidity remained high, including postoperative infection in 58 (50%), intraoperative urologic injury in 10 patients (9%), and need for transfusion in 102 patients (87%). The data identify abnormal adherent placentation as the primary cause for gravid hysterectomy. The data also illustrate how the incidence of emergency peripartum hysterectomy increases significantly with increasing parity, especially when influenced by a current placenta previa or a prior cesarean section. Maternal morbidity remained high although no maternal deaths occurred.

According to Knight Marian et al From the obstetric records of all deliveries at Brigham and Women's Hospital between Oct. 1, 1983, and July 31, 1991, we identified all women undergoing emergency peripartum hysterectomy, calculated crude and adjusted incidence rates, conducted statistical tests of linear trends and heterogeneity, and observed the clinical indications preceding the onset of this procedure. There were 117 cases of peripartum gravid hysterectomy identified during this period, for an overall annual incidence of 1.55 per 1000 deliveries. The rate increased with increasing parity and was significantly influenced by placenta previa and a history of cesarean section. The incidence by parity increased from one in 143 deliveries in nulliparous women with placenta previa to one in four deliveries in multiparous women with four or more deliveries with placenta previa.

Likewise, the incidence increased from one in 143 deliveries in women with one prior live birth and a prior cesarean section to one in 14 deliveries in multiparous women with four or more deliveries with a history of a prior cesarean section. Both these trends were highly significant ($p < 0.001$). Abnormal adherent placentation was the most common cause preceding gravid hysterectomy (64%, $p < 0.001$), with uterine atony accounting for 21%. Although no maternal deaths occurred, maternal morbidity remained high, including postoperative infection in 58 (50%), intraoperative urologic injury in 10 patients (9%), and need for transfusion in 102 patients (87%). The data identify abnormal adherent placentation as the primary cause for gravid hysterectomy. The data also illustrate how the incidence of emergency peripartum hysterectomy increases significantly with increasing parity,

especially when influenced by a current placenta previa or a prior cesarean section. Maternal morbidity remained high although no maternal deaths occurred.

PPH has many potential causes, but the most common, by a wide margin, is uterine atony, ie, failure of the uterus to contract and retract following delivery of the baby. PPH in a previous pregnancy is a major risk factor and every effort should be made to determine its severity and cause. In a recent randomized trial in the United States, birthweight, labor induction and augmentation, chorioamnionitis, magnesium sulfate use, and previous PPH were all positively associated with increased risk of PPH.

A recently published, large population based study supported these findings with significant risk factors, identified using a multivariable analysis, being: retained placenta (OR 3.5, 95% CI 2.1-5.8), failure to progress during the second stage of labor (OR 3.4, 95% CI 2.4-4.7), placenta accreta (OR 3.3, 95% CI 1.7-6.4), lacerations (OR 2.4, 95% CI 2.0-2.8), instrumental delivery (OR 2.3, 95% CI 1.6-3.4), large for gestational age (LGA) newborn (OR 1.9, 95% CI 1.6-2.4), hypertensive disorders (OR 1.7, 95%CI 1.2-2.1), induction of labor (OR 1.4, 95%CI 1.1-1.7) and augmentation of labor with oxytocin (OR 1.4, 95% CI 1.2-)

As a way of remembering the causes of PPH, several sources have suggested using the “4 T’s” as a mnemonic: tone, tissue, trauma, and thrombosis.

Ongoing bleeding secondary to an unresponsive and atonic uterus, a ruptured uterus, or a large cervical laceration extending into the uterus requires surgical intervention. Laparotomy for PPH following a vaginal delivery is rare. In a

review of emergency peripartum hysterectomies over a 5-year period in Los Angeles, Calif, the rate was 1 in 1000 deliveries, but most of these cases began as cesarean deliveries, usually for placenta previa. A study from Boston, Mass, found a rate of 1.5 in 1000 deliveries with similar risk factors. Canadian and Irish studies put the rate at 0.4 and 0.3 per 1000 deliveries, respectively.

Adequately resuscitate the patient before surgery. This includes optimizing hemoglobin and coagulation status as previously described. Fully inform anesthetic and operating room staff as to the nature of the case. Schedule for a second surgeon to be in attendance, if possible. As mentioned previously, sustained bimanual compression and massage and uterine packing may be used to gain time to mount a surgical response. Military antishock trousers provide the equivalent of an approximately 500 to 1000 mL auto transfusion and potentially gain time during a resuscitation. Only the leg portion of the trousers is inflated in the setting of PPH. Direct compression of the aorta may be performed for a short period while the operating room is prepared.

A recent systematic review examined various techniques used when medical management is unsuccessful. These included arterial embolization, balloon tamponade, uterine compression sutures, and iliac artery ligation or uterine devascularization. At present, no evidence suggests that any one method is more effective for the management of severe PPH. Randomized controlled trials of the various treatment options may be difficult to perform. Balloon tamponade is the least invasive and most rapid approach and may thus be the logical first step.

The choice between a subumbilical vertical incision and a Pfannenstiel incision for entry into the abdomen is left to the individual surgeon. Both entries have support, and no strong evidence indicates that either is superior in this setting. If concern exists regarding pathology in the upper abdomen or if exposure is thought to be a concern, the vertical incision is recommended. Broad-spectrum antibiotic coverage is advised.

Upon entry, remove any free blood and inspect the uterus and surrounding tissues for evidence of rupture or hematoma. If uterine rupture is found, a rapid decision must be made concerning the viability of repair versus hysterectomy. Bleeding may be reduced in either instance by grasping bleeding points on the torn edges with clamps. The number of layers used for any repair is dictated by the thickness of the tissue and the hemostatic response to suturing.

Principles are similar to those of cesarean delivery incision repair. Ensure that bleeding is stopped and not merely internalized because this would result in ongoing vaginal bleeding or hematoma formation. Any repair must be carefully observed for hemostasis before abdominal closure is performed. Uterine exteriorization may improve exposure and decrease operating time, but great care must be taken to not worsen uterine trauma and to keep the uterus warm and well perfused to avoid worsening atony. Hemostasis must be reassessed after the uterus is returned to the abdominal cavity. Consider placement of a suction drain.

If the uterus is intact upon entry and the bleeding has been caused by atony, then direct bimanual massage and compression may be performed while

systemic uterotonics are continued. Direct injection of oxytocin, carboprost, and/or ergonovine may be successful in overcoming atony.

Uterine artery ligation is a relatively simple procedure and can be highly effective in controlling bleeding from uterine sources. These arteries provide approximately 90% of uterine blood flow. The uterus is grasped and tilted to expose the vessels coursing through the broad ligament immediately adjacent to the uterus. Ideally, place the stitch 2 cm below the level of a transverse lower uterine incision site. A large atraumatic (round) needle is used with a heavy absorbable suture. Include almost the full thickness of the myometrium to anchor the stitch and to ensure that the uterine artery and veins are completely included. The needle is then passed through an avascular portion of the broad ligament and tied anteriorly. Opening the broad ligament is unnecessary. Perform bilateral uterine artery ligation. While the uterus may remain atonic, blanching is usually noted and blood flow is greatly diminished or arrested.

Local oozing may be controlled with direct injection or compression with warm saline packs. In a series of 265 cases, a 95% success rate was reported using this procedure in PPH unresponsive to uterotonics in patients who had cesarean births.⁵² Another series of 103 cases had a 100% success rate if a stepwise approach was taken.⁵³ After initial uterine artery ligation, subsequent stitches were placed 2-3 cm below the initial stitches following bladder mobilization, and, finally, ovary artery ligation was performed if required. Menstrual flow and fertility were not adversely affected.

The ovarian artery arises directly from the aorta and ultimately anastomoses with the uterine artery in the region of the uterine aspect of the uteroovarian ligament. Ligation is performed just inferior to this point in a manner similar

to that of uterine artery ligation. The amount of uterine blood flow supplied by these vessels may increase following uterine artery ligation. The procedure is easy to perform; however, the potential benefit must be weighed against the time required to perform the ligations.

Internal iliac artery ligation can be effective to reduce bleeding from all sources within the genital tract by reducing the pulse pressure in the pelvic arterial circulation. One study indicated that pulse pressure was reduced by 77% with unilateral ligation and by 85% with bilateral ligation. Hypogastric artery ligation is much more difficult to perform, more commonly associated with damage to nearby structures, and less likely to succeed than uterine artery ligation. One study reported a success rate of 42%. In patients who undergo hypogastric artery ligation, uterine artery ligation has usually already failed.

Prerequisites for the procedure include a stable patient, an operator experienced in the procedure, and a desire to maintain reproductive potential. The retroperitoneal space is entered by incising the peritoneum between the fallopian tube and the round ligament. The ureter must be identified and reflected medially with the attached peritoneum. The external iliac artery is identified on the pelvic sidewall and followed proximally to the bifurcation of the common iliac artery. The ureter passes over the bifurcation. The internal iliac artery is identified and followed distally approximately 3-4 cm from its point of origin. The loose areolar tissue is carefully cleared from the artery. A right-angle clamp is passed beneath the artery at this point, with great care to avoid damage to the underlying internal iliac vein.

A recommendation is to pass the clamp from lateral to medial in order to minimize the chance of damage to the adjacent external iliac vessels. Gentle elevation of the artery with a Babcock clamp facilitates this maneuver.

Ligate the artery with heavy absorbable suture, but do not divide it. Palpate the femoral and distal pulses before and after the ligation to ensure that the external or common iliac artery was not inadvertently ligated. If possible, place the ligation distal to the posterior division of the artery because this decreases the risk of subsequent ischemic buttock pain. Identification of the posterior division may be difficult, and ligation 3 cm from the internal iliac artery origin usually ensures that it is not included.

Hysterectomy is required if internal iliac artery ligation is unsuccessful. Patients in whom internal iliac artery ligation has failed have greater morbidity than those in whom the procedure has not been attempted. The likelihood of benefit from the procedure must be balanced against the potential risks. The advent of more effective uterotonic agents, the fact that most cases of intractable hemorrhage are now related to abnormalities of placentation that are diagnosed or suggested before delivery, and the option of embolization have lessened the use of hypogastric artery ligation. The number of surgeons comfortable using this procedure and the opportunities to teach it are rapidly declining.

Hysterectomy is curative for bleeding arising from the uterine, cervical, and vaginal fornices. The procedure of peripartum hysterectomy is well described in several texts and articles), and the technique differs little from that in

nonpregnant patients While the organ is more vascular, the tissue planes are often more easily developed. Total hysterectomy is preferred to subtotal hysterectomy, although the latter may be performed faster and be effective for bleeding due to uterine atony. Subtotal hysterectomy may not be effective for controlling bleeding from the lower segment, cervix, or vaginal fornices. Take every opportunity to become involved when peripartum hysterectomies are performed.

Angiographic embolization in the management of PPH was first described more than 30 years ago. As with all of the surgical and most of the medical treatments of PPH, no RCTs regarding its effectiveness have been conducted. This is likely to remain the case for some time given the relative rarity of intractable PPH. Several case series suggest that selective arterial embolization may be useful in situations in which preservation of fertility is desired, when surgical options have been exhausted, and in managing hematomas. Follow-up of women undergoing successful embolization for severe intractable PPH reports that women almost invariably have a return to normal menses and fertility.

The major drawbacks of the procedure are the requirement for 24-hour availability of radiological expertise and the time required to complete the procedure. Patients must be stable to be candidates for this procedure. Complications include local hematoma formation at the insertion site; infection; ischemic phenomena, including uterine necrosis in rare instances; and contrast-related adverse effects. Currently, most PPH cases requiring hysterectomy are related to placenta previa. These patients are commonly diagnosed before delivery and are usually delivered by elective

cesarean birth. This planning may allow increased use of invasive radiological services in the management of such cases.

Recent case series and case reports advocate the use of transmural uterine compression sutures to rapidly control bleeding. The initial reports described the B-Lynch technique, which involves opening the lower segment and passing a suture through the posterior uterine wall and then over the fundus to be tied anteriorly. A similar technique has been described without opening the uterus. A long, straight needle is passed anterior to posterior through the lower uterine segment; the suture is passed over the fundus and then tied anteriorly. Both techniques use bilateral stitches. The most recent variant uses multiple stitches passed transmurally and tied anteriorly at various points over the uterine body. This technique may be focused in the area of the placental bed in cases of abnormal placentation. All of these procedures effectively produce tamponade by compressing together the anterior and posterior walls.

Follow-up reports suggest a normal return to menses and fertility, but the number of cases is small. The techniques have the advantage of being very simple to perform and may be a rapidly effective alternative to hysterectomy.

In the past, most cases of intractable PPH followed vaginal delivery and were due to uterine atony; however, more recent case series and national databases show that more cases are now associated with cesarean delivery. Cesarean delivery for placenta previa carries a relative risk of 100 for peripartum hysterectomy, with many patients having a diagnosis of placenta accreta. High-resolution ultrasound

with color Doppler may allow antenatal diagnosis of placenta accreta.

Whenever possible, delivery of the placenta at cesarean delivery should be performed in an assisted fashion following the administration of a uterotonic agent, preferably oxytocin. This practice leads to less blood loss and less infectious morbidity.

Uterine rupture has also become a more common cause of severe PPH necessitating hysterectomy. The vast majority of these cases occur in patients with a previous cesarean birth. Counsel all women with placenta previa, and especially those with a previous low segment uterine scar, in the antenatal period regarding the risk of severe PPH and the possible need for transfusion and even hysterectomy. Ensure that these patients are cared for in facilities with the resources to manage them successfully if complications arise.

The management of bleeding at cesarean delivery or following uterine rupture is not greatly different from that following vaginal delivery. Aggressive resuscitation is performed with attention to restoration of circulating volume and oxygen-carrying capacity and correction of hemostatic defects. Direct bimanual compression may be used in the case of atony. Retained tissue may be removed under direct visualization. Abnormally adherent tissue is a concern; leave it in situ if it cannot be easily removed.

Direct intramyometrial injection of uterotonics may be undertaken. Vasopressin (0.2 U in 1 mL of NS) may also be injected into the myometrium, with great

care taken to avoid intravascular injection. Individual vessels in the placental bed may be ligated. Simple or box stitches may be placed where continuous oozing is present.⁶² In cases of placenta previa, the lower uterine segment may be temporarily packed; leaving a pack in the uterus is also an option. The end of the pack is fed through the cervix and into the vagina and is removed 24-36 hours later. Uterine rupture or extension of a uterine incision requires excellent visualization and careful repair with attention to adjacent structures.

The stepwise surgical approach described above may be used if these measures are unsuccessful and preservation of fertility is desired. Strongly consider immediate hysterectomy if further reproduction is not an issue or if bleeding or damage to the uterus appears severe. Embolization may be considered in this setting. Its successful use has been described both intraoperatively to preserve the uterus and after hysterectomy for continued bleeding. Embolization may also be used for continued postoperative vaginal bleeding.

Persistent bleeding following hysterectomy may also be managed by packing with gauze brought out through the vagina or by a pelvic pressure pack composed of gauze in a sterile plastic bag brought out through the vagina and placed under tension. This pack is also known as a parachute, mushroom, or umbrella pack. Place a Foley catheter to monitor urine output and prevent urinary retention. The placement of a suction drain may be useful to monitor losses in cases of ongoing oozing. Always consider coagulopathy in patients with continued slow blood loss

Continue resuscitation, and repeat laboratory tests. Monitor vital

signs, urine output, and any ongoing losses. Care in an intensive care setting is advantageous, as is close follow-up by the obstetric service. The patient must be monitored for complications.

******MATERIALS AND**

METHODS***

MATERIALS AND METHODS

Emergency obstetric hysterectomy encompasses hysterectomies that were performed in the immediate postpartum period both following normal delivery and Caesarian sections. When it follows caesarian section it is called caesarian hysterectomy. If it follows normal delivery means it is post partum hysterectomy. Peripartum hysterectomy includes both.

Case sheets of emergency hysterectomy for these major indications [resistant atonic PPH, rupture uterus, adherent placenta] were taken and analysed. It is a retrospective analytical study over past 10 years 2000-2009 in our ISOKGH institution. Forty nine cases were done during 1990-1999. All 49 case records were available for analysis.

Each case record is analysed in detail in regard of age, parity, booking status, whether referral or not, indication type of hysterectomy, and post operative complications.

Detailed history and examination findings from case sheet noted. Emphasis was given on any obstetric interference /previous surgeries and risk factors. Previous caesarian, CPD, grand multi, malpresentations, Forceps/ Vaccum, Oxytocin/Gel induction, manual removal of placenta, previous MTP, placenta praevia, PIH, diabetes risk factors present in each case noted. Preoperative and post operative haemoglobin values noted.

If it is a referral case, place and facility referred from time delay,

mode of transport and why patient, selected this facility everything noted thoroughly. Is there any time delay for proceeding to hysterectomy should be noted.

In cases of PPH hysterectomy was carried out only when all conservative measures failed. Medical management includes 20U synto drip,iv Methergin, Inj.prostadin, rectal misoprostal which of these tried in each case noted.

Whether uterine artery ligation, Internal iliac artery ligation, and B-lynnch done or not noted whether subtotal/total hysterectomy done were noted.

Per operative findings from case sheet noted. In cases of rupture uterus type/ extent/ site /size /Involvement of uterine vessels /broad ligament haematoma /colporrexix / bladder involvement were looked for. Decision on hysterectomy in cases of rupture taken depending on age / parity / extent of rupture /and infection.

Bladder and bowel repair done or not were noted. Injury to ureter during hysterectomy should be noted from case sheet. How it is managed also analysed.

Was the patient admitted in shock and prompt resuscitative measures done or not was noted. Blood transfusion was given in most cases. No of transfusions noted down.

Intra operative and post operative complications, duration of hospital stay and condition at discharge noted. In cases of maternal mortality, cause of death noted was and analysed.

: By means of hospital-based data over ten years I sought to evaluate the clinical indications and incidence of emergency peripartum hysterectomy

by demographic characteristics and reproductive history.

Case sheets were collected from medical records department with the help of Medical Records Officer Mrs.Punithavathy and other staff there.

******RESULTS AND ANALYSIS*****

INCIDENCE

Total number of deliveries between 2000 -2009 was 1,15,875.

Total number of peripartum hysterectomies was 49. Forty nine case records will be available for analysis. **INCIDENCE OF EMERGENCY HYSTERECTOMY IN OUR HOSPITAL WAS 0.4 / 1,000 LIVE BIRTHS.**

The incidence of Peripartum hysterectomy that is quoted in the recent literature is 0.24-1.4 per 1000 births. Incidence of peripartum hysterectomy is low as surgeon is very resistant in deciding hysterectomy hence the reproductive capability of the mother will be lost. Cases of resistant PPH will be managed by medical management first. Medical management includes 20U synto drip, iv methergin, inj. syntometrine, im prostadin, and rectal misoprostal.

Various techniques used when medical management is unsuccessful. These included arterial embolization, balloon tamponade, uterine compression sutures, and iliac artery ligation or uterine devascularization Balloon tamponade is the least invasive and most rapid approach and may thus be the logical first step. In our institution internal iliac artery ligation is the logistic first approach in order to preserve uterus .In cases of multipara proceeded to hysterectomy early.

In cases of rupture also management depends on site, size, type, extent and living children of the mother. Hysterectomy is last resort but should be a timely decision. Senior skilled obstetrician should be available for this procedure.

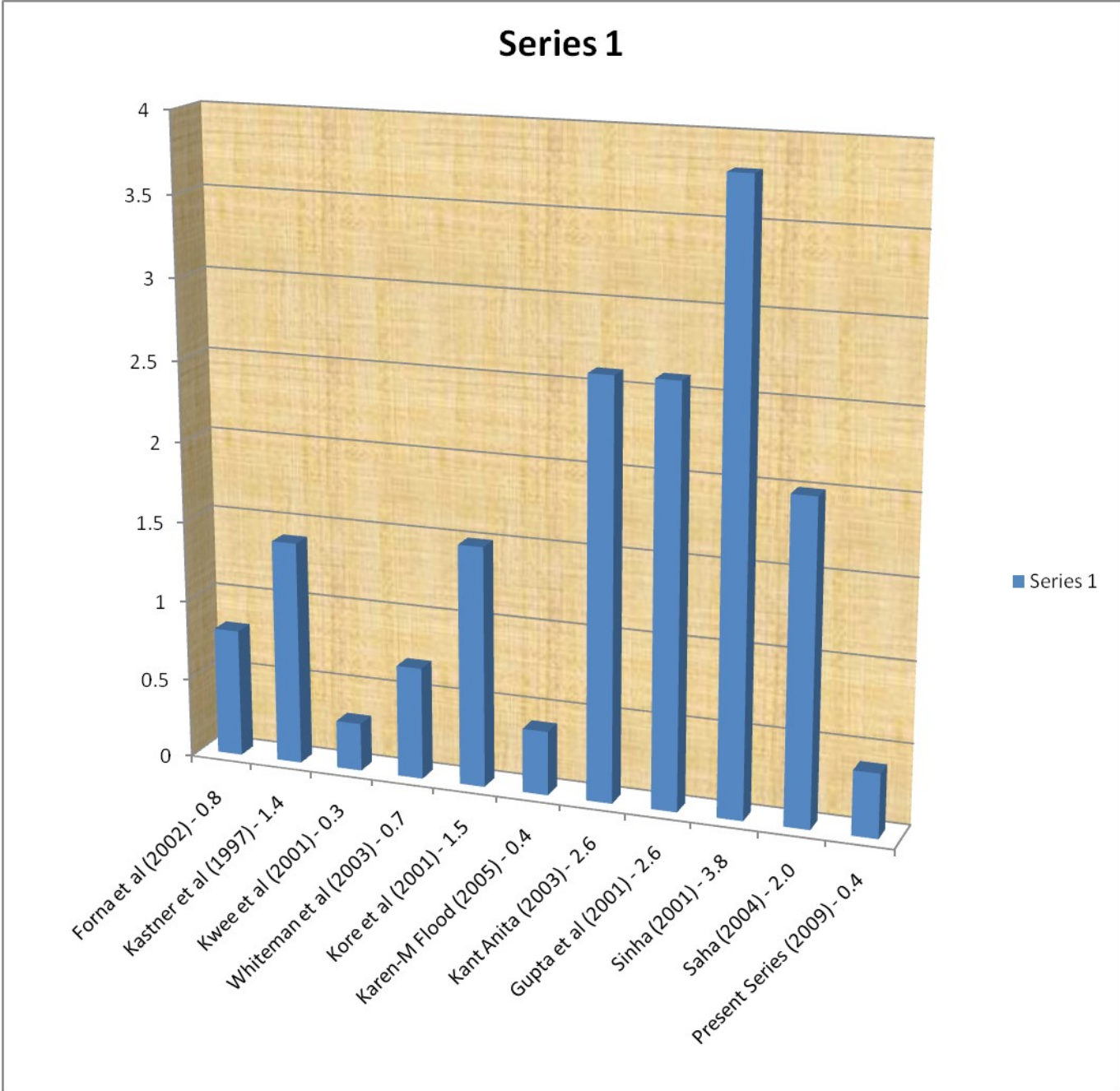
Duration	Caesarean Section / Total Deliveries %	Incidence of Obstetric Hysterectomies / 1000 live births	Obstetric Hysterectomy with H/o Caesarean Section
2000-2009	38.9	0.4	32 (65%)

Among the total deliveries 38.9% delivered by LSCS. With in 49 hysterectomies 32 [65%] hysterectomies were done following caesarian section. Only seventeen hysterectomies were following labour natural. Blood loss following caesarian section was more than following labour natural.

In the past, most cases of intractable PPH followed vaginal delivery and were due to uterine atony; however, more recent case series and national databases show that more cases are now associated with cesarean delivery. Cesarean delivery for placenta previa carries a relative risk of 100 for peripartum hysterectomy, with many patients having a diagnosis of placenta accreta

Whenever possible, delivery of the placenta at cesarean delivery should be performed in an assisted fashion following the administration of a uterotonic agent, preferably oxytocin. This practice leads to less blood loss and less infectious morbidity. Another consideration is the differing capacities of individual patients to cope with blood loss. A healthy woman has a 30-50% increase in blood volume in a normal singleton pregnancy and is much more tolerant of blood loss than a woman with high risk pregnancies.

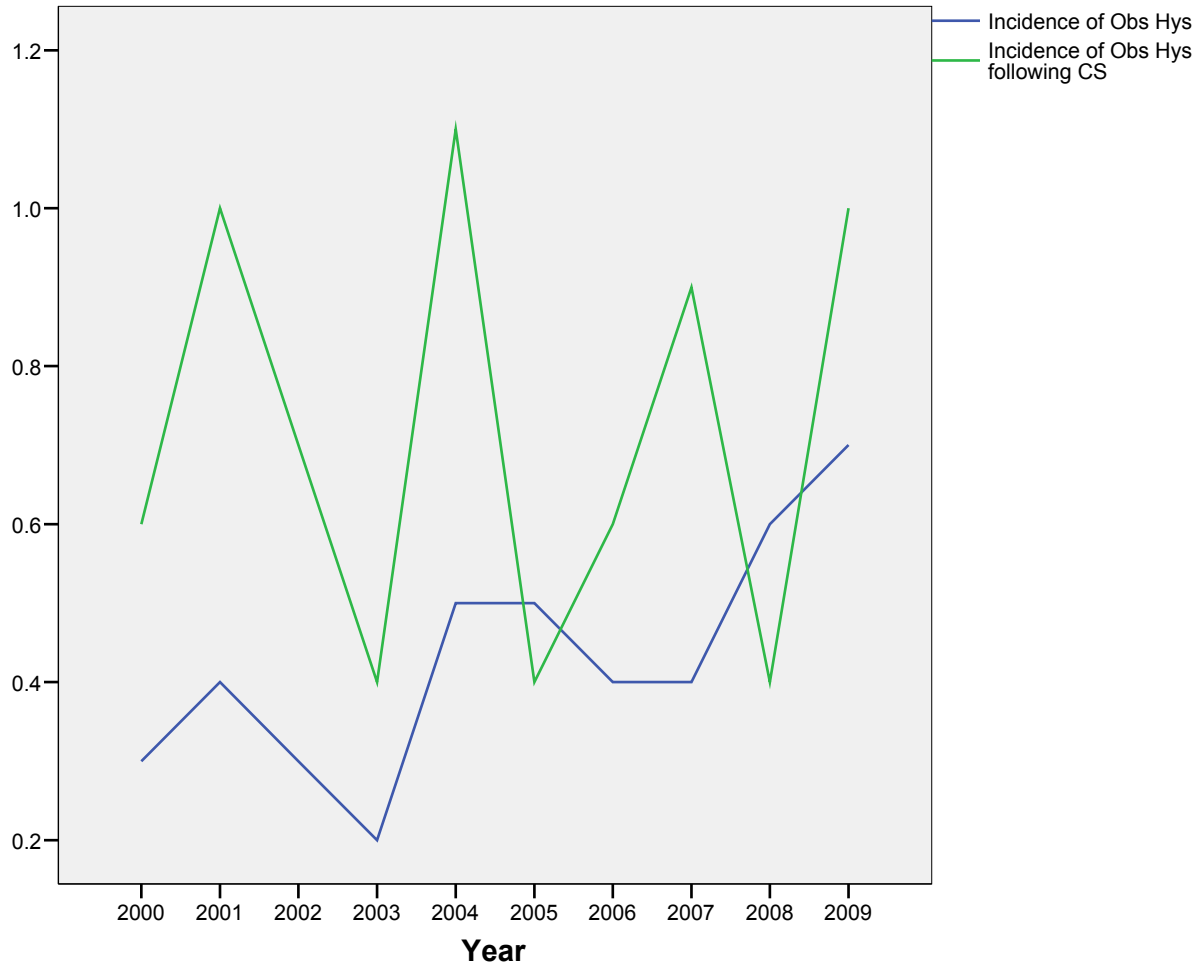
COMPARISION WITH OTHER REPORTED SERIES



The present study compares with “Changing Trends of Emergency Hysterectomy” by Karen-M Flood et al (2005), Rotunda Hospital, Ireland.

INCIDENCE OF EMERGENCY HYSTERECTOMY FOLLOWING CAESAREAN SECTION WAS 0.7 PER 1,000 LIVE BIRTHS.

Incidence of emergency hysterectomies has increased from 0.3 in 2000 to 0.7 in 2009. Incidence of emergency hysterectomy following caesarian also rising from 0.6 in 2000 to 1.0 in 2009. Rise in both of these categories were due to rise in the no of caesarians.



The incidence of obstetric hysterectomy has been on the rise over the past 10 years from 0.3 to 0.7 silently and slowly. It sounds an alarm to obstetricians. It is essential that every obstetrician should be skilled enough to do this procedure.

MATERNAL CHARACTERISTICS

AGE INCIDENCE

AGE (yrs)	No. Of Cases	Percentage	Valid Percent	Cumulative Percent
<20	2	4.1	4.1	4.1
21-25	9	18.4	18.4	22.4
26-30	17	34.7	34.7	57.1
31-35	17	34.7	34.7	91.8
36-40	3	6.1	6.1	98.0
>40	1	2	2	100
Total	49	100	100	

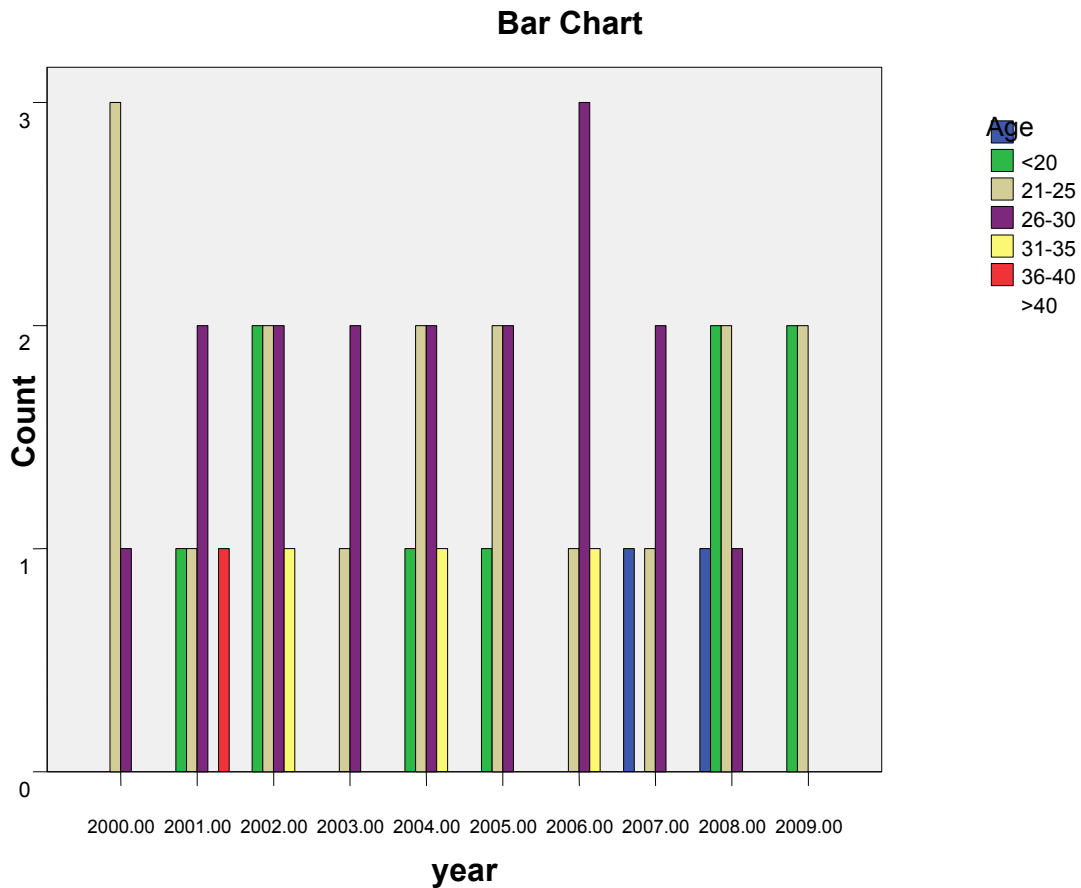
The majority of women belong to the age group 26-35 years (69.4%). 9 women (18.4%) belong to the age group of 21 to 25. Marriage at an early age and becoming Para 2 or 3 is a common characteristic feature among Indian women.

Only 2 women less than 20 years had undergone emergency hysterectomies. A case of post datism wherein induction of labour was done using PGE2 gel was taken for LSCS due to foetal distress. Following LSCS patient developed resistant atonic PPH which could not be controlled despite Internal Iliac Artery ligation. The second case also presented with the same picture but for natural labour followed by resistant PPH and subsequent laparotomy and sub total hysterectomy.

One patient belonging to the age group above 48 years with most

known complications (Anaemia, PIH, Asthma) and parity G9P6L6A3 developed resistant atonic PPH following labour natural and was managed by laparotomy and TAH with BSO.

Age distribution in each year was also analysed. No significant inferences derived. Here number of cases was equal in 26 to 30 and 31 to 35 categories. But most studies say that number of cases should be more in 30 to 35 years.



parityGA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	G2A1	2	4.1	4.1	4.1
	G2P1I1	1	2.0	2.0	6.1
	G2P1L1	6	12.2	12.2	18.4
	G3P1L0A1	1	2.0	2.0	20.4
	G3P1L1A1	8	16.3	16.3	36.7
	G3P2L1	4	8.2	8.2	44.9
	G3P2L2	7	14.3	14.3	59.2
	G4A3	1	2.0	2.0	61.2
	G4P1L1A2	3	6.1	6.1	67.3
	G4P2L0A1	1	2.0	2.0	69.4
	G4P2L1A1	3	6.1	6.1	75.5
	G4P2L2A1	1	2.0	2.0	77.6
	G4P3L1	2	4.1	4.1	81.6
	G4P3Lo	1	2.0	2.0	83.7
	G5P2L2A2	1	2.0	2.0	85.7
	G5P4L2	1	2.0	2.0	87.8
	G6P2L2A3	1	2.0	2.0	89.8
	G9P6L6A3	1	2.0	2.0	91.8
	Primi	4	8.2	8.2	100.0
	Total	49	100.0	100.0	

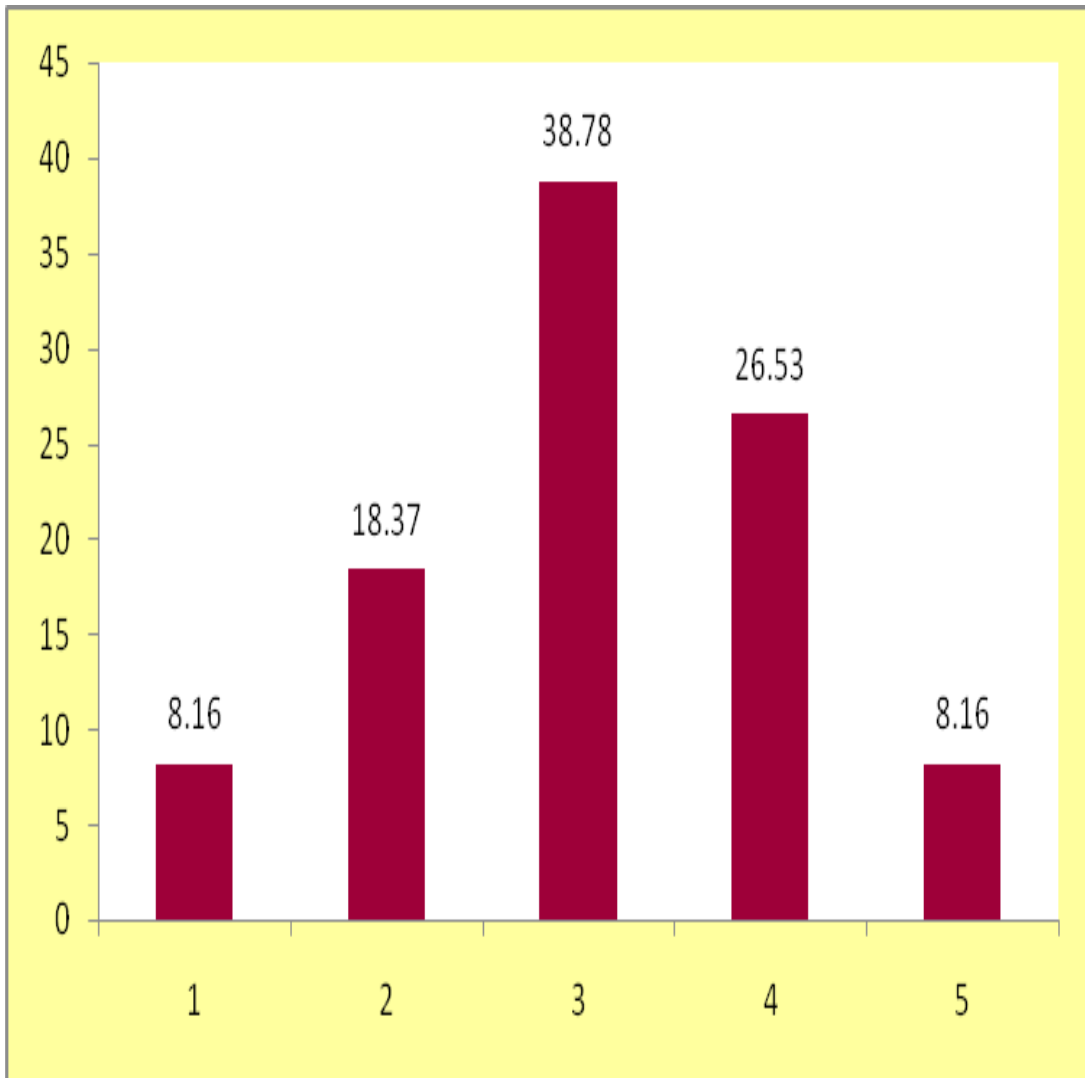
DISTRIBUTION OF PARITY

Parity	No. Of Cases	Percentage	Valid Percentage	Cumulative Percentage
1	4	8.16	8.16	8.16
2	9	18.37	18.37	26.53
3	19	38.78	38.78	65.31
4	13	26.53	26.53	91.84
>5	4	8.16	8.16	100
Total	49	100	100	

4 women were primipara and 4 others grand multipara, the remaining 83.6% belonging to

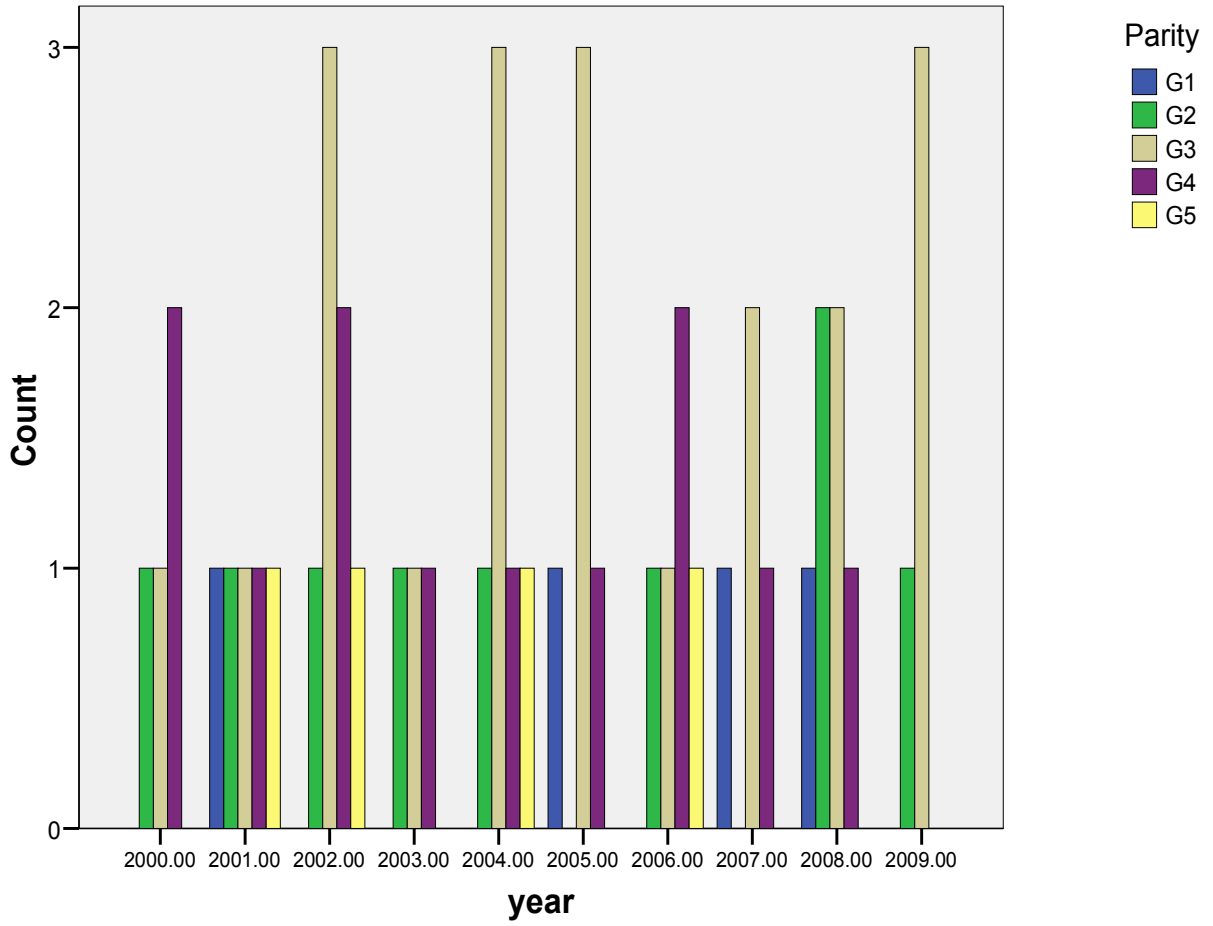
parity 2,3 & 4. The total number of cases in 4th & 5th gravida should be more but it is less probably as a result of awareness regarding sterilization. The parity distribution was positively skewed indicating that peripartum hysterectomy increased with parity.

PARITY DISTRIBUTION



PARITY DISTRIBUTION IN EACH YEAR

Bar Chart



AGE & PARITY DISTRIBUTION

-----PARITY-----

Age	1	2	3	4	>5

<20	2					2
21-25	2	4	2		1	9
26-30		1	8	7	1	17
31-35		4	8	5		17
36-40			1	1	1	3
>40					1	1
	4	9	19	13	3	49

Nine cases were in the age group 21 to 25 among these two cases were primi, 4 cases 2nd gravida 2 cases were third gravida and one case G6P2L2A3 following labour natural developed resistant atonic PPH proceeded to TAH with BSO.

Among the 4 primiparas two were already discussed. One case referred as a case of deep transverse arrest, baby delivered by LSCS developed atonic PPH, internal iliac artery ligation also failed to arrest atonic PPH proceeded to subtotal baby also deeply asphyxiated and died. Other primi case unbooked GDM hydramnias, labour natural, atonic PPH, internal iliac artery ligation proceeded to TAH.

COMPARISION OF BOOKING STATUS

S.No	Status	No. of cases	Percentage
1	Booked in KGH	19	38.8

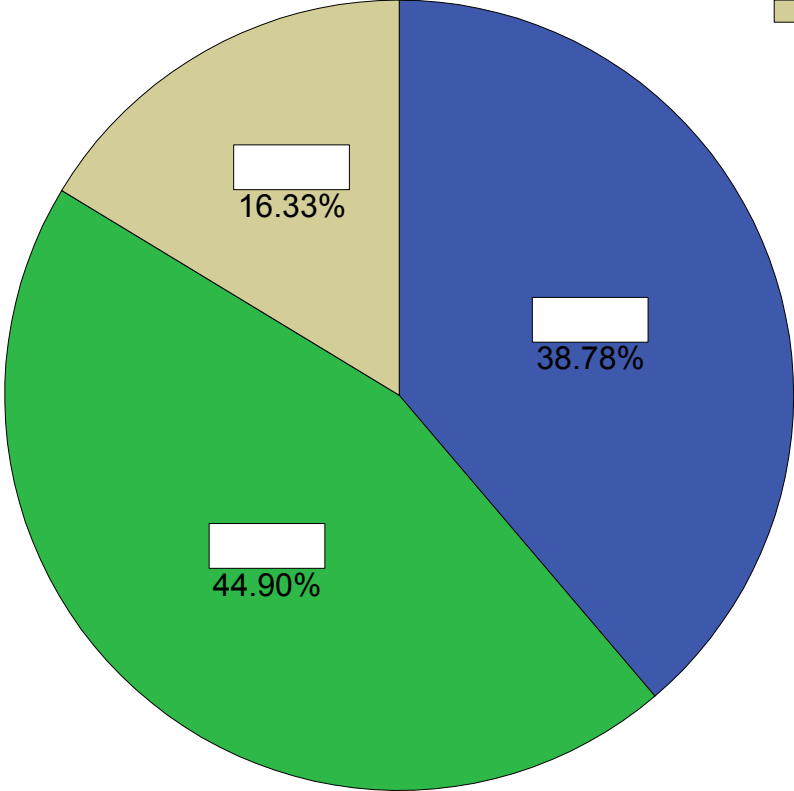
2	Booked Elsewhere	22	44.9
3	Unbooked	8	16.3
TOTAL		49	100

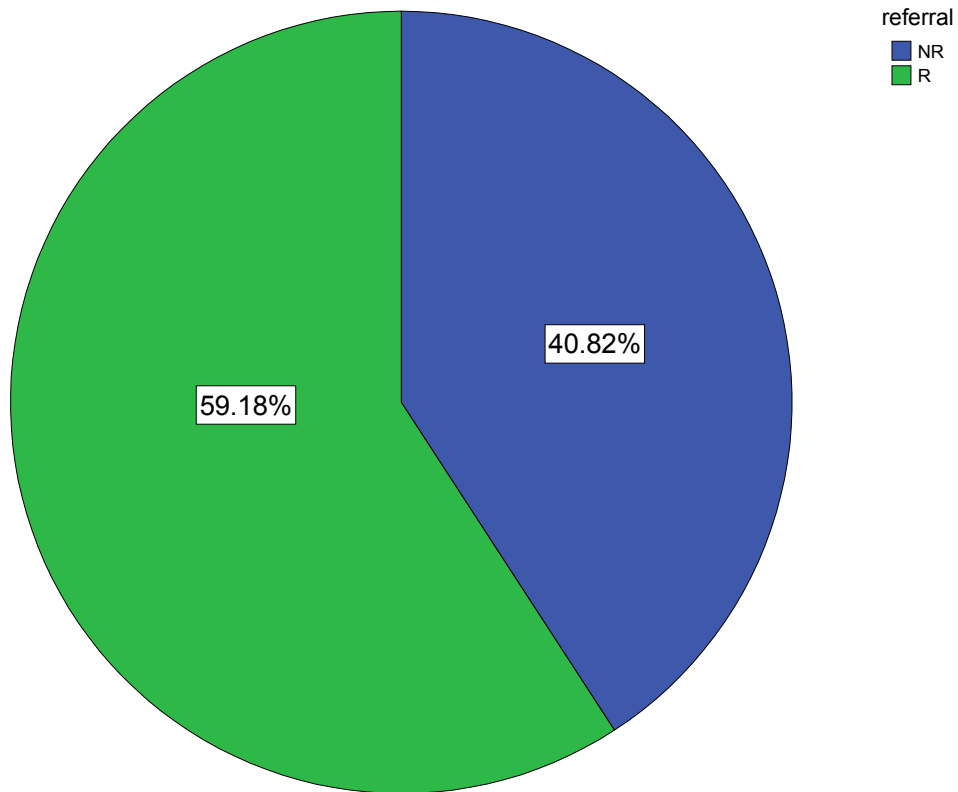
Incidence of emergency obstetric hysterectomy is found to be more common in unbooked cases and those booked outside. The ratio between cases booked in KGH and elsewhere being Failure to recognise and manage risk factors antenatally and ineffective handling of labour related complications are the prime reasons for the higher incidence of peripartum hysterectomies in cases booked elsewhere, delayed referral being another cause. RATIO NR:R 3:2

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Booking Status

- BK
- BO
- UB





RISK FACTORS

One or more of these risk factors present in each case.

1. Anaemia
2. PIH
3. GDM
4. DM Complicating
5. Grand Multi

6. Previous 1 LSCS
7. Previous 2 LSCS
8. Previous MTP's
9. Previous Manual Removal of Placenta
10. Hydramnios
11. Twins
12. Abruptio
13. Placenta Praevia – IV
14. Induction of Labour with Oxytocin / PGE2 Gel
15. Recurrent PIH
16. Asthmatic
17. BOH
18. Epilepsy -
19. Previous 3 LSCS
20. Rh Negative
21. Deep Transverse Arrest

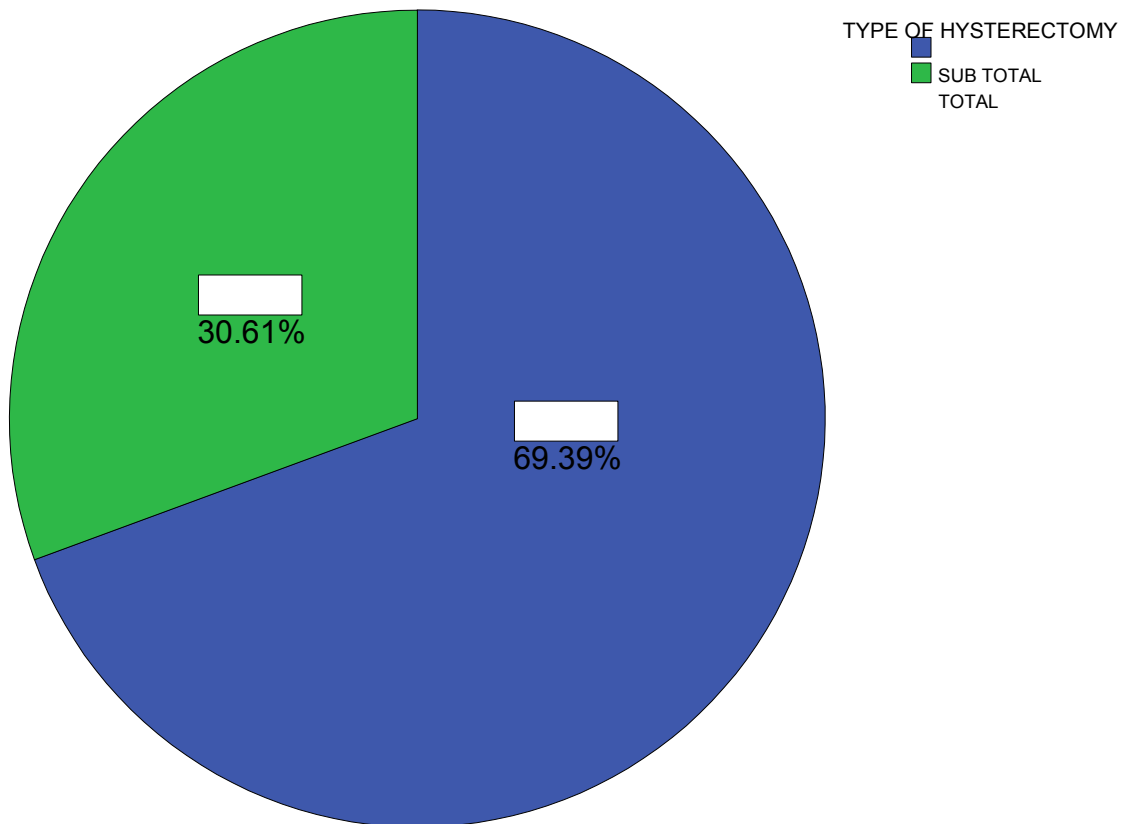
PREVIOUS.LSCS being the most common risk factor in the present series. Among the 49 cases 25 cases had previous scar in uterus.14 cases were previous LSCS, 10 cases were previous 2 LSCS, only one previous 3 LSCS. Forna et al found a 10-fold increased risk of PH in cases with a history of CS.

Knight et al showed that the associated risk of PH also extends beyond the initial CS into subsequent deliveries; women who have had 1 previous CS have more than double the risk of PH in the next pregnancy and women who have had ≥ 2 previous CSs have > 18 times the risk.

KWEE et al were also able to show that the number of previous CSs was related to an increased risk of placenta accreta, from 0.19% for 1 previous CS to 9.1% for ≥ 4 previous CSs. Sakse et al analyzed 181 cases from 1995-2004 with abnormally adherent placentation that accounted for 38% of cases, 68% of which had a previous CS

In many instances, the obstetrician can anticipate the possible need for postpartum hysterectomy and the woman can be apprised of this risk in the antenatal period. When obtaining informed consent prior to labor and delivery, the indications for peripartum hysterectomy, the chances of needing the procedure, and the possible outcome should be discussed with the patient and documented.

TYPE OF HYSTERECTOMY



According to present series

69.39% cases were sub total hysterectomies
30.61% cases were total hysterectomies.

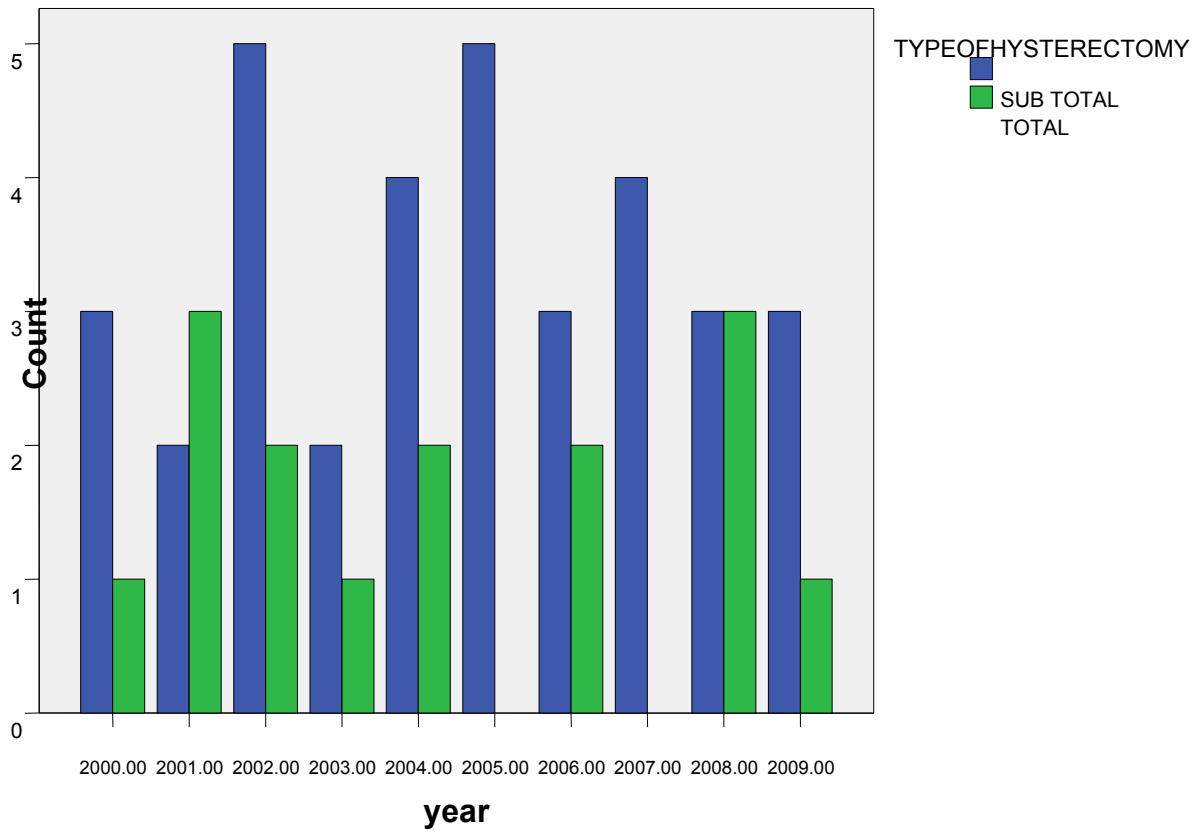
TYPE OF HYSTERECTOMY

Subtotal Hysterectomy was the most commonly performed operation during these past 10 year in ISOKGH. Subtotal hysterectomy is said to be a safer procedure and may be quicker. It is associated with less post operative morbidity since the infected and torn uterus is removed in case rupture uterus. There is often debate regarding the benefits of subtotal vs. total hysterectomy. Some studies say subtotal hysterectomy may not always be sufficient to abate the hemorrhage, especially from the cervical branch of the uterine artery. Most studies have shown that there is no difference in blood loss or transfusion rates when comparing total vs. subtotal procedures. Arguments for the performance of subtotal hysterectomies include findings of less operation time required and a reduced hospitalization period.

Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Sub	3	2	5	2	4	5	3	4	3	3	34
Total	1	3	2	1	2	0	2	0	3	1	15
	4	5	7	3	6	5	5	4	6	4	49

We found no differences in preoperative and postoperative hemoglobin, operating time, and blood transfusions given when total and subtotal emergency peripartum hysterectomies were compared. However, there was a trend for more surgical intensive care unit admissions and postoperative complications in the total abdominal hysterectomy group. The earlier literature supports the performance of a

total hysterectomy for reduction in potential cervical stump malignancy, need for regular cytology, and other problems such as bleeding or discharge.



BLOOD TRANSFUSION

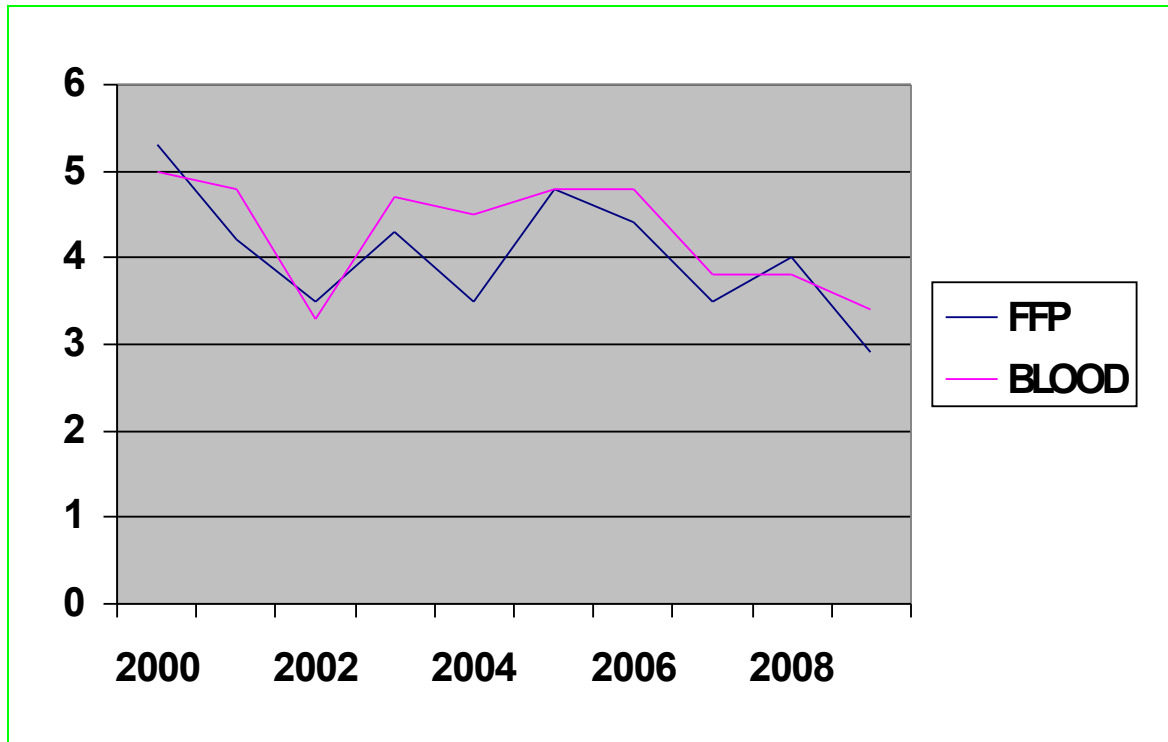
Year	No. of Hysterectomies	Blood given	Mean	FFP given	Mean
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2000	4	21	5.3	20	5
2001	5	21	4.2	24	4.8
2002	4	14	3.5	13	3.3
2003	3	13	4.3	14	4.7
2004	6	21	3.5	27	4.5
2005	5	24	4.8	24	4.8
2006	5	22	4.4	24	4.8
2007	4	14	3.5	15	3.8
2008	6	24	4	23	3.8
2009	7	20	2.9	24	3.4
	49	194	4.0	208	4.2

Only one case was given maximum amount of blood 11units of blood and 8 units of FFP. She is a G3P2L2 delivered by labour natural developed resistant atonic PPH ,total hysterectomy done, relaparotomy done for unexplained hypotension.The reason being broad ligament haematoma.

Blood and FFP given in all cases. Average was 4 units of blood and 4 units of FFP. Average amount transfused during 2000 was 5.3 and 2009 was 2.9. Reasons for this reduced need was less operating time and early decision. Ten years back average duration was three hours now it is only one and half hours. A consultant or an experienced specialist usually performed obstetric hysterectomy in our institution. Emergency obstetric hysterectomy, though uncommon, remains a potentially life-saving procedure which every obstetrician must be familiar with.

Changing Trends In Blood Transfusion



INDICATIONS OF INEVITABLE PERIPARTUM HYSTERECTOMY

Three common indications are

- Resistant atonic PPH
- Rupture Uterus
- Adherent Placenta

Among these most common being RESISTANT

ATONIC PPH

indications

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Adherent Placenta	8	16.3	16.3	16.3
Atonic PPH	24	49.0	49.0	65.3
Obs Labour with atonic PPH	1	2.0	2.0	67.3
Obs Labour with Rup Ut	1	2.0	2.0	69.4
Plaecnta Percreta, Transfund	1	2.0	2.0	71.4
Ruptured Uterus	11	22.4	22.4	93.9
Ruptured Uterus with bladder	3	6.1	6.1	100.0
Total	49	100.0	100.0	

Among these obstructed labour leading to atonic PPH in one case primipara being the late referral asphyxiated baby delivered by LSCS unable to control PPH even by internal iliac artery ligation life of mother only saved by subtotal asphyxiated baby died in 3days. That mother last the baby and uterus both. Internal iliac-artery ligation is not effective for patients with massive blood loss. In such cases, it is desirable to make an early decision.

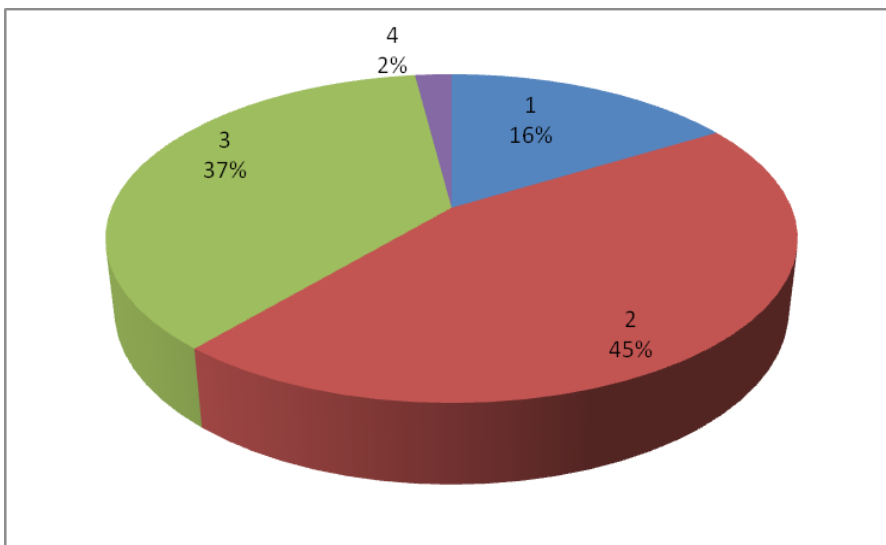
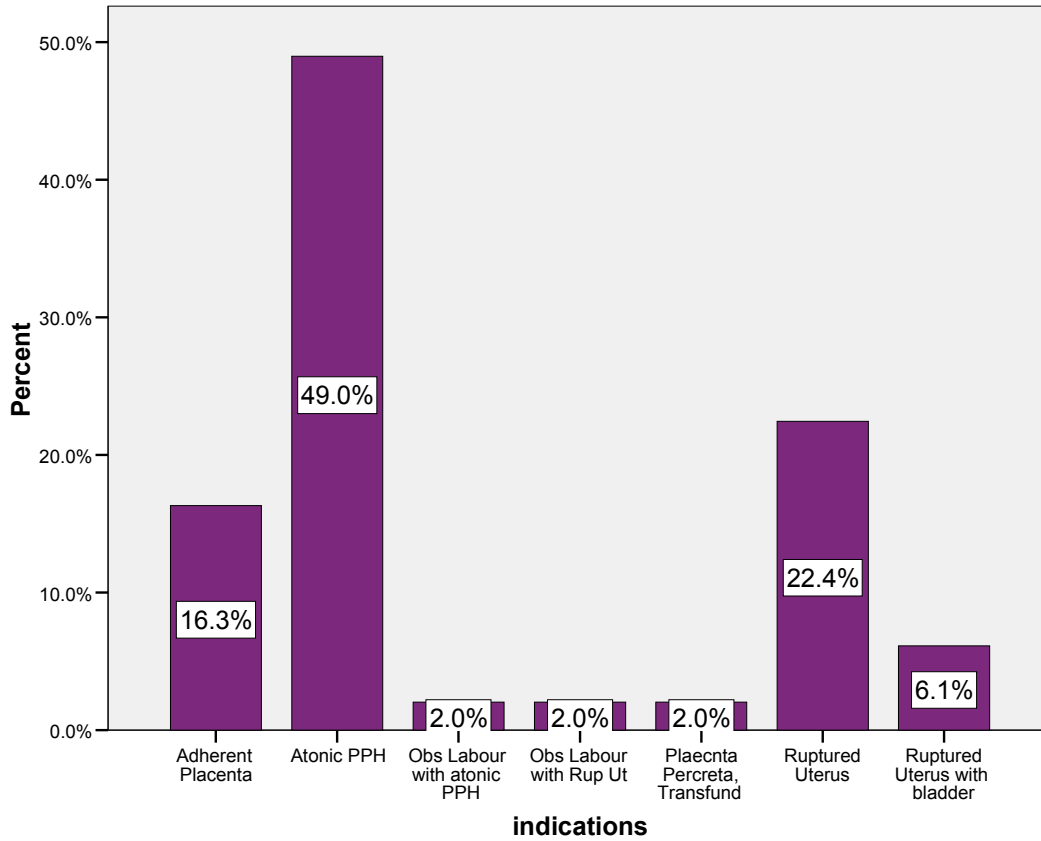
In other case obstructed labour leading to rupture in G5P2L2A2 previous two normal deliveries delayed referral being the cause.

In three cases uterine rupture extends to bladder also. These cases managed with the help of urologist.

Another risk factor that has been associated with rupture of the unscarred uterus is abnormal placentation. The incidence of placenta accreta without a prior cesarean section or placenta previa has been estimated at 1 in 68,000. Although these events are rare, clinicians must remember that uterine rupture is a possibility in any laboring patient who exhibits abdominal pain, hypovolemia, and fetal compromise. This concept is explained by this case G3P2L2 previous two normal deliveries preterm Transfundal rupture Placenta percreta being the cause.

S.No	Indications	Cases	Percent	Valid Percent	Cumulative Percent
1	Adh Placenta	8	16	16	16
2	Atonic PPH	22	45	45	61
3	Rupture Uterus	18	37	37	98
4	Placenta Percreta, Transfundal rupture	1	2	2	100
		49	100	100	

Interestingly, in the developed countries, placenta accereta is the most common indication for peripartum hysterectomy. In view of the increasing risk of obstetric hysterectomy following previous caesarean section, high risk cases associated with abnormal placentation may be identified using ultrasound, allowing appropriate pre-operative counselling regarding the risk of peripartum hysterectomy.



- 1- Adherent Placenta
- 2- Atonic PPH

- 3-3-Rupture Uterus
- 4- Placenta Percreta with transfundal rupture

Caesarian section rate rising during these 10 years. No of rupture

uterus cases also rising during these 10 years. Ruptured uterus which is

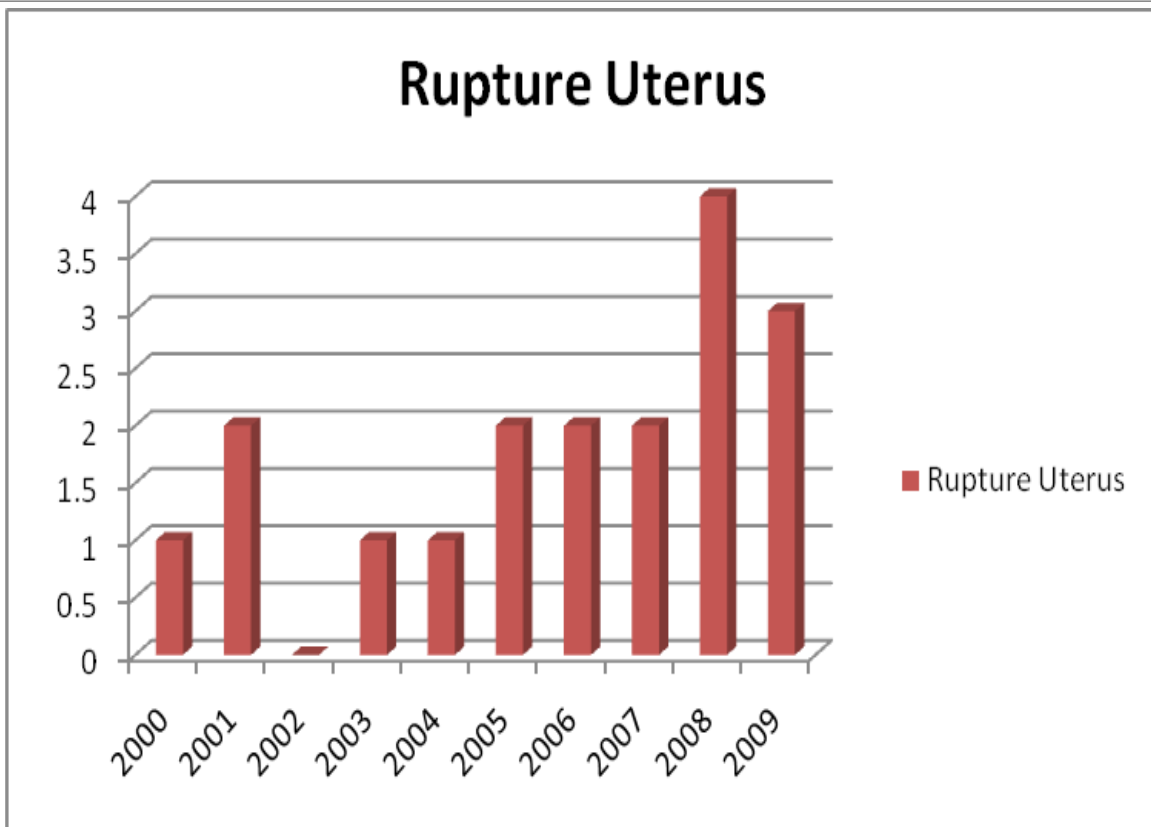
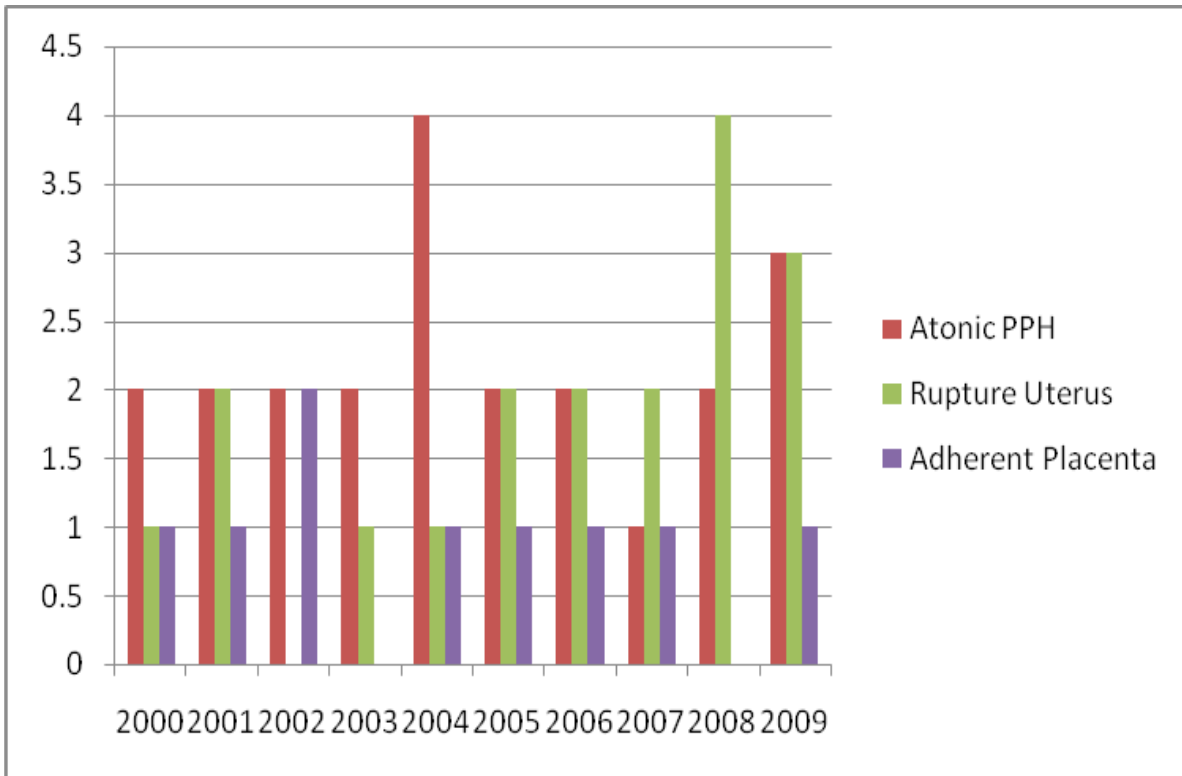
associated with poor pre-surgical clinical state may end in emergency hysterectomy.

The risk of rupture with a T-shaped or classical incision is much higher, and ranges from 4% to 9%.

Important predictors that have been identified include a prior spontaneous vaginal delivery, prior successful VBAC, maternal age, maternal obesity, number of prior cesarean sections, the type of closure of the prior uterine incision, gestational age at delivery, and the inter pregnancy interval.

Intuitively, one would assume that if a woman who has a history of one cesarean section has an increased risk of uterine rupture, then two or more prior incisions would increase that risk further.

Bujold and colleagues demonstrated a fourfold increased risk of uterine rupture with single-layer uterine incision closure



POST OPERATIVE COMPLICATIONS

Post operative Complications

	Frequency	Percent
No Complications	24	49.0
Amniotic Fluid Embolism	1	2.0
Cardiac Arrest	1	2.0
Febrile Morbidity	15	32.6
Infection	3	8.2
Jaundice	1	2.0
Paralytic Ileus	1	2.0
VVF	1	2.0
Total	49	100.0

Among the 49 cases 24 patients had no post operative complications. Febrile morbidity was the commonest post operative complication accounting for 32.6% followed by wound infection 8.2%. One patient developed VVF after 10 days. Paralytic ileus was seen in one patient on the 7th day. One patient developed ureteric injury another developed bladder injury during subtotal hysterectomy which were managed with the help of urologist. 3 patients had bladder rupture along with uterine rupture where bladder rent repair was done. Uncontrollable haemorrhage and shock being the most common intra operative complications.

MATERNAL MORTALITY

There were 4 maternal deaths giving a maternal mortality rate of

8%

	Frequency	Percent	Valid Percent	Cumulative Percent
Death	4	8.2	8.2	8.2
Good	45	91.8	91.8	100
Total	49	100	100	

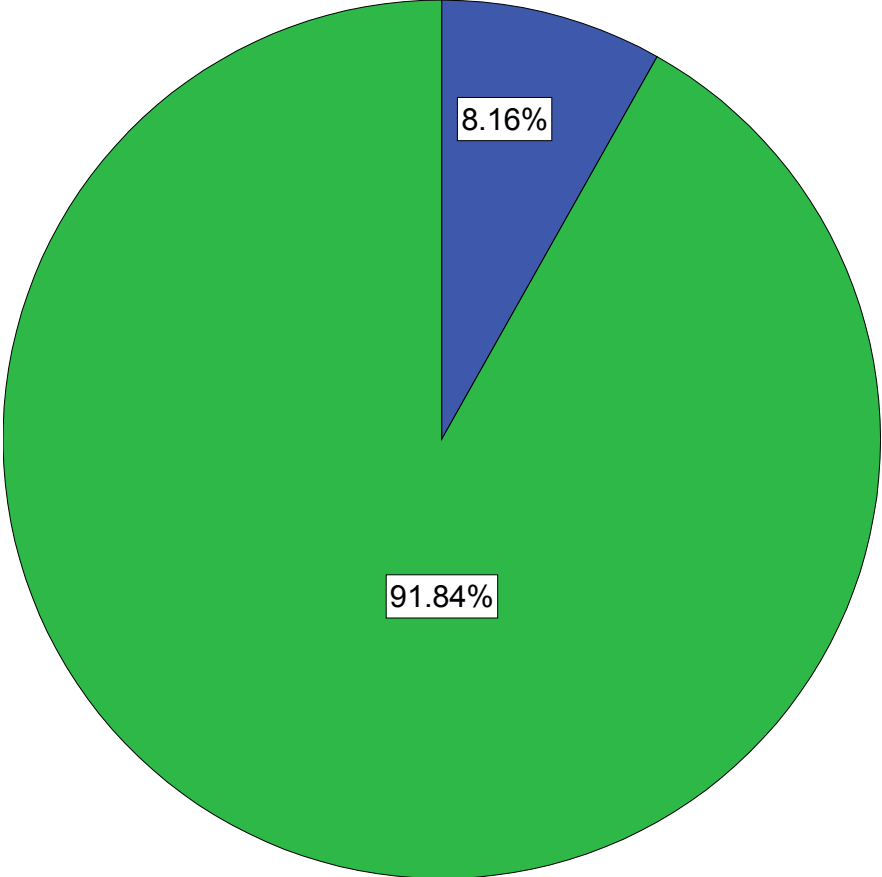
Causes Of Maternal Mortality:

- (i) Hypovolemic Shock - 2
- (ii) DIC - 1
- (iii) Amniotic Fluid Embolism - 1

Among the 2 cases of hypovolemic shock one case being previous LSCS came in full dilation /referral case /baby delivered by outlet forceps followed that rupture identified proceeded to subtotal hysterectomy though the patient transfused with adequate blood patient went in hypovolemic shock and died. In the 2nd case,also a referral case the rupture was identified in the casualty and proceeded to sub total hysterectomy and in spite of all resuscitative measures patient died.The 3rd case a case of multi (Rh Negative), abruption/ macerated IUD, who was referred late developed amniotic fluid embolism, during the process of expulsion, leading to cardiac arrest and the patient died.The 4th case following instrumental vaginal delivery, developed resistant atonic PPH died due to DIC inspite of sub total hysterectomy.

atdischarge

- Death
- Good



*******DISCUSSION***

DISCUSSION

The incidence 0.4/1000 is in agreement with recent studies from other European countries that reported rates of 0.24 per 1000 births in Denmark, 0.36 per 1000 births in Turkey, 0.33 per 1000 births in The Netherlands, and 0.41 per 1000, 0.45 per 1000, and 0.36 per 1000 births in the United Kingdom. In a review of emergency peripartum hysterectomies over a 5-year period in Los Angeles, Calif, the rate was 1 in 1000 deliveries, but most of these cases began as cesarean deliveries, usually for placenta previa. A study from Boston, Mass, found a rate of 1.5 in 1000 deliveries with similar risk factors. Canadian and Irish studies put the rate at 0.4 and 0.3 per 1000 deliveries, respectively.

Incidence of emergency hysterectomy following caesarian section 0.7/1000 live births which is low when compared with 1.6 per live births reported in Netherlands but similar with 0.5/ 1,000 live births in Africa. Caesarian section rate in KGH is raising from 27.9 to 47.4. incidence of caesarian hysterectomy also rising from 0.6 to 1/1000 live births. According to Karen M flood et al the overall CS rate has increased from 6-19% during these 2 decades, the percentage of PH that occurs in the setting of a previous CS has increased from 27-57% (P < .00001). The performance of PH in the setting of CS increased from 61.3-80. According to present series the percentage of caesarian section in the setting of previous caesarian being 51%, in the setting of caesarian section being 65%. According to KNIGHT The risk associated with previous cesarean delivery was higher with increasing numbers of previous cesarean deliveries]). Women undergoing a first cesarean delivery in the current pregnancy were also at increased risk (OR 7.13, 95% CI 3.71-13.7).

Kumari archana of ranchi 2009 statistics 69% compares with

present series of 69.4% belonging to 26 to 35 years. All studies states that more no of cases in this age group. Emergency hysterectomy is strongly associated with age>35years. – Sixty-one percent of the women were in the age group of 26-35 years.KANT anita 2003. REINALDO of New York. The mean maternal age of the study group was 32.3 ± 4.8 years.

59% cases referred from outside. And 62% of cases were unbooked . In comparison with all other studies emergency hysterectomy is positively skewed no of cases increases with increasing parity.

According to present series 69% cases were subtotal. In 1963, Tervila reported cancer rates in the retained cervical stump ranging from 0.39% to 1.9%. With the advent of cytologic screening, there has been a dramatic decrease in the incidence of cervical cancer. At the present time, the incidence of cervical cancer is reported as 0.1% to 0.15%; the unscreened women are most likely to be affected.

Although subtotal hysterectomies were uncommonly done in the studies by Chestnut et al and Zelop et al (9% and 21%, respectively), Clark et al and Stanco et al reported 53% of their hysterectomies as subtotal. KASTNER et al of New York Thirty-eight (80.9%) of the hysterectomies were subtotal .IN Indian study KANT ANITA of 2003 In 62% of the cases, subtotal hysterectomy was performed.

According to present series 45% atonic PPH, 37% rupture uterus ,16% adherent placenta ,2% placenta percreta leading to transfundal rupture . These values comparable with Kant anita 2003 Postpartum hemorrhage (41.46%) and ruptured uterus (36.58%) were the two major indications for obstetric hysterectomy.

All hysterectomies were performed as emergency procedures, with massive postpartum haemorrhage being the major indication for operation in nine cases. LAU HEDY 1998 Morbidly adherent placenta (32.7%) was the most common cause of uncontrollable haemorrhage.

Suchartwatnachai with uterine atony as the most common indication (32.5%), followed by placenta accreta (26.2%), uterine rupture (10.0%), extension of cervical tear to the lower uterine segment (8.7%), broad ligament hematoma (6.2%) and placenta previa (5.0% Farah Lonea of UK jan 2009. A total of 38 (73%) EOHs were performed for intractable bleeding after cesarean delivery.

REINALDO of NEW york uterine atony the most common 69.2% Thirty-eight (80.9%) of the hysterectomies were subtotal. Postoperative febrile morbidity was 34%; other morbidity was 26.3%.

George Daskalakis of 2002 All of the cases were due to massive postpartum hemorrhage. The most common underlying pathologies was placenta accrete). According to Zeiop abnormal adherent placentation was the most common cause preceding gravid hysterectomy (64%, $p < 0.001$), with uterine atony accounting for 21%. Although no maternal deaths occurred

Average amount 4 units of blood transfused.hospital stay>11days it compares with Indian studies. The mean hospitalization time was 8 days RAMATHIBODI's Yaw-Ren Hsu The mean hospitalization time was 8 days (range, 5–24 days.

According to present series febrile morbidity 32.6% wound infection

8% compares with Mumbai studies. Postoperative febrile morbidity was 34%; other morbidity was 26.3%.

Comparison with other studies: Mortality

India:	Kant Anita (2003)	- 9.7%
United States:	Eniola et al (1998)	- 4.5%
	Rahman et al (2003)	-11.6%
	Sakse et al (2004)	- 1.1%
Nigeria:	Adehiyi (2005)	- 59.1%
	Present Series	- 8%

Contributing the high figures in Nigeria are poverty, poor infrastructure, rapid growing population without the appropriate means and lack of effective strategy to cope with the situation.

Our statistics lie in between that of the U.S and Nigeria.

******SUMMARY & CONCLUSION******

SUMMARY AND CONCLUSION

The Incidence of emergency obstetric hysterectomy in our study was 0.4/1000 live births. Incidence being comparable with changing trends of emergency hysterectomy - (karen M flood 2005), Rotunda hospital Ireland. Incidence emergency hysterectomy is also rising slowly 0.3/1000 in 2000 to 0.7 2009 . Incidence of obstetric hysterectomy following caesarian section being 0.7/1000 live births. Incidence being comparable with ADESIYUM ADIEBI 2008 Nigerian studies.

Majority of women 69.4% belonging to the age group 26 to 35 years. Two cases in the age group 20 years and in the age group 48 years. Parity distribution also positively skewed no of cases increases with parity. Analysis of age and parity distribution was also done.

Sixty two percent of the cases were unbooked and booked outside. Sixty percent of the cases were referred from outside, previous caesarian being the major risk factor.

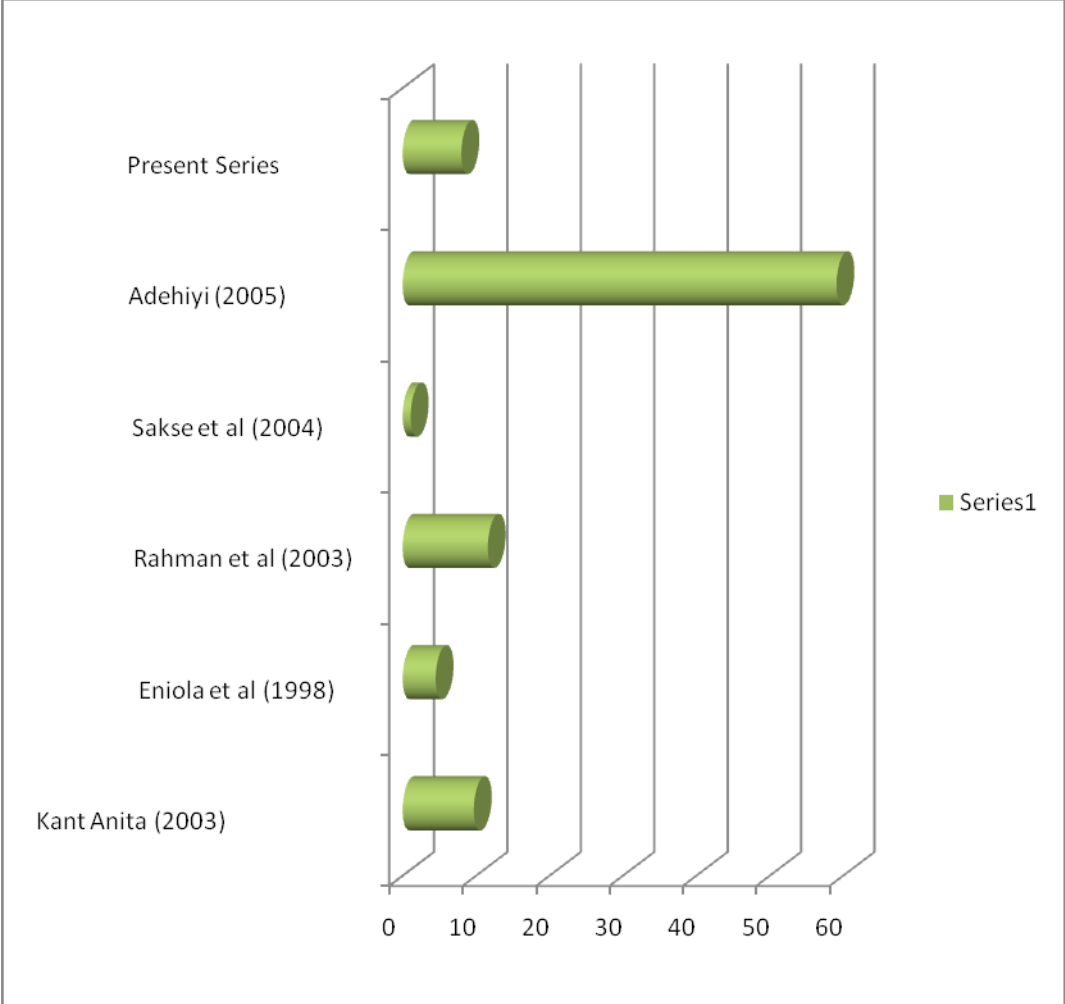
Atonic PPH being the most common indication for emergency hysterectomy present in 45% of cases. Rupture uterus in 37% Adherent placenta in 16% adherent placenta leads to fundal rupture in 2%. These figures are comparable with studies of George daskalaki et al 2007 ,Greece. Rupture uterus cases are on increase from one in 2000 to 4 in 2008 along with rising caesarian delivery rate.

In 70% of cases subtotal hysterectomy was done as it has less operating time and less morbidity comparing with total hysterectomy.

The need for blood transfusion reduced from 5.3 in 2000 to 2.9 in 2009 due to reduction in operating time and early decision blood is essential and life saving in cases of emergency hysterectomy.

There were 4 maternal deaths giving the mortality rate as 8% comparable with Kant Anita (2003) which appears to be the Indian average.

COMPARISION WITH OTHER STUDIES



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S.No	Name	Year	Age	I.P.No	Booking Status	Parity & Gestational Age	Referral Status	Risk Factors	OUTCOME OF BABY	Indications	TypTA
1	Anuradha	2000	28	3294	BO	G4P3L1	R	2,7	A	Adherent Placenta	LSCS,Sub
2	Kala	2000	33	12471	BK	G2P1L1	NR	13	A	Atonic PPH	Labour Natural, A. liBladder repairation,
3	Hepzibah	2000	26	9354	BO	G3P1L1A1	R	2,3,6	A	Ruptured Uterus	Outlet forceps,S
4	Vidhya	2000	30	7977	BK	G4P1L1A2	NR	1,9	A	Atonic PPH	LSCS,Sub
5	Sathya	2001	48	2876	BO	G9P6L6A3	R	2,5,16	A	Atonic PPH	Labour Natural, BSO
6	Vadivukarasi	2001	23	13426	BO	Primi	R	21	D	Atonic PPH	LSCS,Int.ilic li
7	Shakin	2001	31	11073	BK	G4P2L2A1	NR	2,7	A	Adherent Placenta	LSCS,Sub
8	Saraswathi	2001	27	8941	BO	G2P1L1	R	2,3,6	B	Ruptured Uterus	LSCS,Sub
9	Priya	2001	34	10442	UB	G3P2L2	NR	3,7	A	Ruptured Uterus	LSCS,Sub Total rent repa
10	Gayathri	2002	28	2784	BK	G3P1L1A1	NR	6,8,13	A	Adherent Placenta	LSCS,TAH w
11	Shanmuga Priya	2002	25	10356	BK	G2A1	NR	2,8,14	B	Atonic PPH	LSCS,Sub
12	Syed Ali Fathima	2002	28	14849	BO	G3P2L2	R	1,5	D	Placenta Percreta, Transfundal rupture	LSCS,Sub
13	Jeya Lakshmi	2002	25	19366	BK	G3P2L1	NR	7,13,18	A	Atonic PPH	LSCS,TA
14	Ambika	2003	26	3327	BO	G4P2L1A1	R	7,8,9	A	Ruptured Uterus with bladder injury	LSCS,Sub Total rent repa
15	Mala	2003	32	6134	BK	G2P1L1	NR	1,2,12	B	Atonic PPH	Labour Natural
16	Indhra	2003	34	8446	BO	G3P2L1	R	3,6,10	A	Atonic PPH	LSCS,Sub
17	Shobana	2004	29	4247	BO	G3P1L1A1	R	1,6,8,11	A	Atonic PPH	LSCS,Sub
18	Mary	2004	28	10022	UB	G5P4L2	R	3,5,10	A	Atonic PPH	Labour Natural,
19	Valli	2004	33	5482	BK	G4P2L1A1	NR	7,13	A	Adherent Placenta	LSCS,TA
20	Kalyani	2004	23	9642	BK	G2A1	NR	2,8,14	A	Atonic PPH	LSCS,Int. II: liBladder r repairation,
21	Shamsad	2004	31	2876	UB	G3P2L2	R	1,2,12,20	D	Atonic PPH	LSCS,Sub
22	Pushpalatha	2004	39	1320	BO	G3P1L0A1	R	4,6,8	A	Ruptured Uterus	LSCS,Sub

23	Uma	2005	29	13264	BO	G3P2L2	R	1,5,11	A/D	Atonic PPH	Labour Natural,
24	Devi	2005	31	4149	BK	G4P3L1	NR	2,19	A	Ruptured Uterus with bladder injury	LSCS,Sub Total,rent repa
25	Kousalya	2005	22	2415	UB	Primi	R	3,10	A	Atonic PPH	Labour Natural, A. ligation,
26	Rishwana Begum	2005	34	7908	BK	G3P1L1A1	NR	6,8,13	A	Adherent Placenta	LSCS,Sub
27	Rani	2005	28	5643	UB	G3P2L2	R	1,2,5,16	A	Ruptured Uterus	Labour Natural,
28	Rajalakshmi	2006	32	5472	BO	G3P2L1	R	7,13	A	Adherent Placenta	LSCS,Sub
29	Asha	2006	36	3121	BO	G5P2L2A2	R	1,2,3,5	D	obs.labour with rupture	LSCS,Sub
30	Rehana	2006	29	1429	BO	G4P1L1A2	R	5,8	A	Atonic PPH	Labour Natural, A. ligation,Su
31	Dhivya	2006	31	1482	UB	G2P1L1	R	15	A	Atonic PPH	Vacuum,Sub
32	Parameshwari	2006	32	1369	BK	G4P2L1A1	NR	7,3	A	Ruptured Uterus	LSCS,TAH,Int ligation
33	Sangeetha	2007	34	2478	BO	Primi	R	5,16	B	Obs Labour with atonic PPH	LSCS,Int. Il ligation,Sub
34	Selvi	2007	20	5511	BK	G4P3Lo	NR	6,14	A	Atonic PPH	LSCS,Int. Il ligation,T
35	Vathsala	2007	30	11255	BK	G3P1L1A1	NR	13,17	A	Adherent Placenta	LSCS,Sub
36	Rosy	2007	31	682	BO	G3P1L1A1	R	6,13	B	Ruptured Uterus	LSCS,TA
37	Saroja	2008	28	2361	BO	G3P2L1	R	7	A	Ruptured Uterus with bladder injury	Outlet forcep Total,Bladder re
38	Lakshmi	2008	23	3461	BO	G2P1L1	R	2,6,12	A	Ruptured Uterus	LSCS,Int. Il ligation,Sub
39	Rekha	2008	22	6319	UB	G2P1I1	R	6	A	Ruptured Uterus	Outlet forceps,S
40	Anitha	2008	28	6909	BO	G4P1L1A2	R	1,3,6	D	Ruptured Uterus	LSCS,Sub
41	Shanaz	2008	35	14882	BK	G3P2L2	NR	2,5	A	Atonic PPH	Labour Natura
42	Lakshmi	2008	20	17052	BK	Primi	NR	1,2	A	Atonic PPH	Labour Natural, A. ligation,Su
43	Aruna	2009	27	4771	BK	G4A3	NR	2,8,17	A	Adherent Placenta	LSCS,Int. Il ligation,T
44	Rathi Devi	2009	32	8623	BO	G2P1L1	R	4,6	A	Ruptured Uterus	LSCS,Sub
45	Kavitha	2009	23	1834	BK	G6P2L2A3	NR	1,2,5	A	Atonic PPH	LN,TAH E
46	Alima Banu	2009	26	2400	BO	G3P1L1A1	R	6,8,9	A	Atonic PPH	LSCS,Laparot Total

47	Shyamala	2009	33	5053	UB	G3P2L2	R	1,7	A	Ruptured Uterus	LSCS,Sub
48	Devi	2009	36	3671	BO	G4P2L0A1	R	2,17	A	Atonic PPH	Labour Natural, A. ligation,Su
49	Kalaiselvi	2009	24	11214	BK	G3P1L1A1	NR	6,8,11	A/D	Ruptured Uterus	LSCS,Sub Total rent repa

A- Alive

B- Asphyxiated And Died Later

D- Dead Born

Risk Factors as in Page 50

BK- Booked in KGH

BO - Booked Outside

UB - Unbooked