

**A STUDY ON ASSESSMENT OF BLOOD LOSS
IN THIRD STAGE OF LABOUR USING
VACUUM RETRACTION CANNULA**

DISSERTATION SUBMITTED FOR

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CERTIFICATE

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CERTIFICATE FROM THE DEAN

This is to certify that the dissertation entitled “**A STUDY ON ASSESSMENT OF BLOOD LOSS IN THIRD STAGE OF LABOUR USING VACUUM RETRACTION CANNULA**” is a bonafide and genuine research work done by **Dr.M.VIJAYALAKSHMI**, in partial fulfilment of the requirement for the degree in **M.S.(Obstetrics & Gynaecology)**, under guidance of **Prof. Dr. C.SHANTHI, MD., DGO., FICOG., HOD and Professor**, Department of Obstetrics & Gynaecology.

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DECLARATION

I **Dr.M.VIJAYALAKSHMI** solemnly declare that the dissertation titled **“A STUDY ON ASSESSMENT OF BLOOD LOSS IN THIRD STAGE OF LABOUR USING VACUUM RETRACTION CANNULA”** has been prepared by me. I also declare that this bonafide work or a part of this work was not submitted by me or any other for any award, degree, diploma to any other University board either in India or abroad.

This is submitted to The Tamilnadu Dr. M. G. R. Medical University, Chennai in partial fulfillment of the rules and regulation for the award of M.S degree Branch – II (Obstetrics & Gynecology) to be held in April 2017.

Place : Madurai

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CONTENTS

CHAPTER NO	TITLE	PAGE NO
1	INTRODUCTION	1
2	AIM & OBJECTIVES	11
3	REVIEW OF LITERATURE	12
4	MATERIALS AND METHODS	24
5	OBSERVATIONS	32
6	DISCUSSION	70
7	SUMMARY	74
8	CONCLUSION	77
9	BIBLIOGRAPHY	78
10	PROFORMA	
11	MASTERCHART	
12	ETHICAL CLEARANCE CERTIFICATE	
13	PLAGIARISM CERTIFICATE	

INTRODUCTION

Improving healthcare for women during childbirth in order to prevent and treat PPH is an essential step towards the achievement of Millennium Development Goal 5 (MDG 5)

LABOUR- THIRD STAGE

The third stage of labour starts from delivery of baby till the delivery of the placenta. Mean time for third stage of labour is around 15 min.

Delivery of placenta mechanism

- Following delivery of baby, there is lowering of the uterine fundus due to 'retraction'. This is facilitated by the typical arrangement of the uterine musculature (circular) fibres.
- The retraction reduces area of the uterine surface where incompressible placenta is attached and separation occurs. Once separation occurs uterus will contract strongly forcing the placenta and membranes into the lower uterine segment.
- As the placenta is being inelastic, shears off its attachment through the deep spongy decidual layer.
- There are two types of separation. Placenta may get delivered spontaneously by maternal effort and the lower maternal edge presents at vulva - marginal (Mathew duncan) method.
- If traction applied on umbilical cord, fetal surface may appear first – central (Schultze) method.
- The bleeding after placental separation is arrested by the following ways

- Retraction of the oblique uterine muscle fibres which compresses torn blood vessels.
- Uterine contraction brings the uterine walls into apposition
- Increased activation of fibrinolytic and coagulation systems around the placental site.

Placental separation sign:

- Uterus become globular and firmer
- Gush of blood from vagina
- Uterus rises in the abdomen at the level of umbilicus because the placenta being separated, passes down into the lower uterine segment where its bulk pushes the uterus upwards.
- Umbilical cord protrudes further out of vagina.

POST PARTUM HAEMORRHAGE

Every year 14 million deaths occur due to obstetric haemorrhage and postpartum haemorrhage accounts for a major proportion of these deaths (WHO 2004). Postpartum haemorrhage is defined as the loss of 500ml or more of blood from the genital tract within 24hrs of birth of a baby, with severe PPH occurring with a blood loss of 1000ml or more. (Mousa and Alfirevic 2007)¹²

The American college of obstetricians and gynaecologists defines PPH as blood loss which decreases the hematocrit by 10% or necessitates transfusion (ACOG 2006). PPH is classified as:

- ✓ Primary PPH occurs within first 24hrs of postpartum
- ✓ Secondary PPH occurs between 24 hrs and upto six weeks of postpartum.

Primary postpartum haemorrhage causes

- 1) Tone – a non contracting atonic uterus is the most common cause
- 2) Tissue – retained products
 - Adherence of placenta
- 3) Trauma –Laceration of genital tract
 - Rarely Uterine rupture
 - Rarely Uterine inversion
- 4) Thrombin – coagulation defects and abnormalities

The blood supply comes from lateral end of the uterus and traverses the myometrium. Primary haemostasis from placental bed is due to compression of the uterine vessels when they pass through the myometrium. The degree of compression of these vessels depends on the force acting on the uterine vessels. This force obeys the law of Young-Laplace relationship ($F = 2T / r$)

F - equals the compressive force acting on blood vessels

T -Wall tension (generated by the uterine contraction)

R - Radius of uterus.

From the formula it is apparent that the force compressing the vessels cannot be very high if r is large. So, it is essential that the radius of the uterus should be made small by emptying the uterus from blood or placental tissue and increasing the wall tension of the uterus (T) by giving ecbolics. This is the main scientific basis of the initial treatment and the prevention of primary postpartum haemorrhage.

Atonic uterus

Uterine atony accounts for majority of cases of PPH 76-81%. Immediately after delivery of the infant and placenta, uterine bleeding associated with a soft boggy uterus on palpation is main characteristic of uterine atony.

Predisposing factors are:

- Labour which is prolonged
- Overdistended uterus
- APH
- Fibroid Uterus
- Higher parity
- Excessive use of oxytocics in labour
- Magnesium sulphate use in labour

- General anaesthesia like halogenated anaesthetics
- Genital tract Trauma
- Large episiotomy
- Perineum, vagina and vulva laceration
- Uterine rupture

However, only 40% of women with PPH will have an identifiable risk factor (Combs et al 1991).

Clinical signs and symptoms in relation to the quantity of blood loss

Blood loss % of blood volume	Systolic blood pressure mmHg	Symptoms and signs
10 -15%	Normal	Postural hypotension with mild tachycardia
15 -30%	Slight fall of BP	Tachycardia,thirst & weakness
30 – 40%	60 -80 mm Hg	Pallor,decrease urine output,confusion, restlessness
>40%	40 – 60 mm Hg	Nil urine output, coma, gasping, death

1. Every pregnant women should be aware of her blood group and Rh typing.
2. Antepartum anemia should be corrected
3. Certain patients are susceptible and predispose to PPH which include
 - i) Multipara
 - ii) H/o PPH/ manual removal of placenta
 - iii) Abruptio placenta
 - iv) Low lying placenta
 - v) Twins
 - vi) Hydramnios
 - vii) Intrauterine death
 - viii) Difficulty in labour
 - ix) Difficult instrumental delivery
 - x) Extraction and Version
 - xi) Breech extraction technique usage
 - xii) LSCS
4. In cases where uterine atony is anticipated, IV infusion is arranged before the delivery.
5. Excessive usage of inhalation anaesthesia should be avoided.

6. As long as the baby is in good condition no need for rapid extraction, the body is delivered slowly. This facilitates in placental separation and permit the uterus to retract sufficiently to control bleeding.
7. As the placenta separated it should be expelled.
8. Squeezing, kneading the uterus before placenta has separated is traumatic and harmful
9. Careful observation of postpartum period is essential.
10. Fibrinogen studies should be done in cases of placental abruption and retained dead fetus
11. When haemorrhage is anticipated sufficient amount of blood should be cross matched and made available.

PREVENTION OF PPH STRATEGIES

Prevention of PPH is a major challenging event in decreasing the universal burden of postpartum haemorrhage especially in low resource settings. Even a small amount of blood loss is life threatening to already anemic patient, it is essential to acquire the knowledge about the ways to prevent PPH before performing treatment of the same. But postpartum haemorrhage is not always possible to prevent but certain general measures are prophylactic and they are:

ANTEPARTUM:

1. Improvement of health status of the women and to keep the haemoglobin level normal ($>11\text{gms}$), so the patient can withstand some amount of blood loss.
2. Postpartum haemorrhage should be anticipated in all high risk patients and institutional delivery should be arranged for high risk cases.
3. Blood grouping is done for all women so that no time is wasted during emergency. Blood should be arranged in all high risk patients.
4. Placental localisation is to be done in all women with previous caesarean delivery by USG or MRI so as to detect placenta accreta or percreta. Placenta previa will be associated with uncontrollable haemorrhage and should be performed by an experienced obstetric surgeon.

INTRAPARTUM:

Active management of third stage of labour should be as a part of routine for all women in labour as it will reduce PPH by 60%.

1. Cases where induced or augmented labour by oxytocin, the infusion should be continued atleast half an hour after delivery.
2. In cases of preeclampsia or anemia, even a normal loss can be detrimental and hence always prompt replacement is mandatory.
3. During labour, use of a partogram will help to avoid prolonged active stage of labour.

4. Dehydration should be avoided by maintaining hydration and if so should be promptly corrected and all patients should have an IV line accessibility in the second stage.
5. After delivery, retained placental tissues are checked for. The genital tract is explored in case of instrumental delivery. Oxytocin infusion is continued and vital signs monitored closely. It is mandatory that patient is not left unattended for two hours following delivery.
6. Observation for about 2 hours after delivery is essential that the uterus is tonic and well contracted before sending her to ward.
7. Local or epidural anaesthesia is always preferable to general anaesthesia in case of forceps, ventouse or breech delivery.
8. All hospital should have a protocol for managing postpartum haemorrhage. Drills are carried out at regular intervals to train the entire labour ward staff, so that they can promptly manage when an emergency occurs.

Finally, it is our intelligent anticipation, skilled and experienced supervision, prompt detection and effective institution of therapy that can prevent low risk or high risk case from undergoing disastrous consequences.

In spite of progress made to reduce morbidity and mortality due to post partum haemorrhage, it is still the leading cause of maternal mortality in low socio economic countries and it is one of the primary cause of nearly one quarter of maternal deaths. All over the world PPH continues along with hypertension and infection as one of the infamous triad of causes of maternal deaths in both

developed and developing countries. It is one of the leading cause for admission of pregnant ladies to maternal intensive care units.

PPH occur in 5.8% women in first pregnancy, risk of a first PPH in a 2nd/3rd pregnancy is 4-5%, risk of recurrence of PPH in consecutive pregnancy is 15%. Since 2000, WHO recommendations support AMTSL as a critical procedure for PPH – CEMONC resulted in 33% reduction in Maternal deaths and AMTSL is one of the important component. In developed countries, PPH decreased as it is largely preventable and also manageable. But in developing countries, mortality remains high due to PPH. Though data are limited, studies shows that PPH as a cause for upto 60% of maternal deaths in developing countries.

Women surviving after severe post partum haemorrhage experiences significant morbidity in form of major interventions, maternal intensive care admission, exposing to blood products, disseminated intravascular coagulopathy, anemia, infection, multi organ damage associated with hypotension and shock and rarely pituitary infarction and last but not least prolonged hospitalization.

Active management of third stage of labour lowers the maternal blood loss and reduces the risk of PPH. Prophylactic oxytocics offered routinely in the management of the third stage of labour in all women as it reduces the risk of PPH about 60%. For women without risk factors for PPH delivering vaginally, oxytocin (10 IU by intramuscular injection) is the drug of choice for prophylaxis in the third stage of labour. Ergometrine may be used in case of absence of hypertension, as it reduces the risk of minor PPH (500-1000 ml) but it increases vomiting. Misoprostol is not as effective as oxytocin but it is used when oxytocin is not available.

AIM AND OBJECTIVES OF THE STUDY

1. To evaluate the applicability of vacuum retraction cannula in decreasing the blood loss in 3rd stage of labour.
2. To compare the effects of AMTSL, AMTSL without uterine massage, AMTSL with vacuum retraction cannula excluding uterine massage in 3rd stage of labour.
3. To compare the effectiveness of vacuum retraction cannula with same pressure maintained at different durations 5mins, 10 mins,15 mins.

REVIEW OF LITERATURE

“PPH is the leading cause of maternal mortality and an important cause for serious morbidity in the developing and developed countries”. Morbidity due to PPH mainly includes surgical interventions, sepsis and also severe anemia. Active management of the third stage of labour reduces postpartum haemorrhage by 60%. The International Federation of Gynecologists and Obstetricians (FIGO), the International Confederation of Midwives (ICM) and WHO recommends routine use of AMSTL for all vaginal deliveries in all the health facilities.

De Groot AN(1995)² narrated that Postpartum hemostasis normally depends on mechanical events which will induce strong contractions of the uterine musculature

Bibi S(2007)³ after auditing found out that Uterine atony, in which there is failure of the uterine muscle to contract normally following delivery of the baby and placenta, it is responsible for up to 70% of all causes of PPH.

ACTIVE MANAGEMENT OF THIRD STAGE OF LABOUR

In 2003, an international joint policy statement developed by the FIGO – ICM was endorsed by the Society of Obstetricians and Gynaecologists of Canada (SOGC). This statement describes the steps of active management of third stage of labour as:

- administration of oxytocic drugs;
- controlled traction of cord and
- uterine massage after delivery of the placenta

Prevention of Postpartum Haemorrhage Initiative (POPPHI) holds AMSTL as the main component for prevention of PPH.

Oxytocic drugs usage

The theoretical use of prophylactic use of oxytocics is for eliciting adequate uterine contraction following delivery of the infant thus reducing the blood loss. WHO recommends uterotonics to all pregnant ladies during third stage of labour for prevention of PPH. There are three main groups of oxytocic drugs – oxytocin, ergot alkaloids (ergometrine) and prostaglandins.

Cord clamping

Active management of third stage of labour usually includes the clamping and dividing the umbilical cord before beginning of controlled cord traction. WHO also recommends delayed clamping of cord. The duration of 3rd stage of labour is reduced by cord clamping. (Enkin et al 1995).

Placenta Delivery

Placenta is delivered by technique of modified Brandt-Andrews method by controlled cord traction. The border of one hand is placed over the mother's abdomen below the level of the uterine fundus suprapubically and other hand should grasp umbilical cord and applies steady traction posteriorly & downwards and uterus is being held upwards to prevent inversion.

The WHO held technical consultation on prevention of postpartum haemorrhage (Mathai and Gulmezoglu 2007) and it recommends that:

- AMTSL should include administration of oxytocin soon after birth of baby, delayed cord clamping and delivery of placenta by controlled cord traction and followed by uterine massage.
- Skilled attendants should offer AMTSL as potential risk such as uterine inversion might result from inappropriate cord traction.
- Oxytocin 10 IU IM is given for prevention of postpartum haemorrhage over preference to ergometrine/methylergometrine or oral, sublingual and rectal misoprostol. If oxytocin not available then ergometrine can be used in cases of without hypertension or heart disease.
- Injectable prostaglandins is not to be used in prevention of PPH in preference to oxytocin
- In the absence of AMSTL, a uterotonic drug (oxytocin or misoprostol) can be offered.

The active management of third stage of labour results in

- ✓ Fewer maternal deaths
- ✓ Fewer maternal admissions to ICU
- ✓ Less blood loss
- ✓ Low usage of blood transfusion & blood products
- ✓ Less use of additional uterotonics
- ✓ Decrease postpartum anemia

✓ Establishment of breastfeeding

The management of PPH will start by conservative medical measures like uterine massage and uterotonic drugs. Severe postpartum haemorrhage in hemodynamically unstable patients likely resulted in hysterectomy which is one of the dangerous procedures and may cause permanent loss of fertility. From last decade, conservative surgical procedures are successful when used in various circumstances and forms.

Elbourne DR et al(2001)⁴ examines the effect of oxytocin when given prophylactic in the third stage of labour on maternal and neonatal outcomes.

Relevant trials were identified in the “Cochrane Collaboration Controlled Trials Register” and the “Pregnancy and Childbirth Review Group's Specialised Register of Controlled Trials”. Date of last search: May 2001. In seven trials involving over 3000 women in hospital and/or developed country settings, prophylactic oxytocin showed benefits (reduced blood loss (relative risk (RR) for blood loss > 500 ml 0.50; 95% confidence interval (CI) 0.43, 0.59) and need for therapeutic oxytocics (RR 0.50; 95% CI 0.39, 0.64).)

Authors concluded that there are also suggestions of benefit for oxytocin in terms of postpartum haemorrhage, and it also the need for therapeutic oxytocics, but without sufficient information about other outcomes and side-effects it may be difficult to be confident about the trade-offs for these benefits

Begley CM et al(2011)⁵ compared the effects of active versus expectant management of the third stage of labour. They searched the Cochrane Pregnancy and Childbirth Group Trials Register Randomised and quasi-randomised controlled trials comparing active versus expectant management of the third stage of labour. Two review authors independently assessed the studies for inclusion, assessed risk of bias and it carried out data extraction, included seven studies (involving 8247 women), undertaken in hospitals, six in high-income countries and one in low-income country. Authors concluded that though there is a lack of high quality evidence, active management of the third stage reduced the risk of haemorrhage greater than 1L at the time of birth in a population of women who are at mixed risk of excessive bleeding, but adverse effects were also identified.

The simple mechanical as well as physiological measures of massaging the fundus, bimanual uterine compression and then emptying the bladder will stimulate uterine contraction represents time-honored first-line management for PPH. No published data and studies were identified to provide an evidence-based for those interventions. But yet professional consensus supports their continued use (RCOP2012)⁵

In some women, the speed with which hemorrhage kills the mother is very rapid, that the usually the first 1 or 2 hours as “Golden hours” will be missed.

Stanton CK et al(2013)⁷ assess the effects, safety and then feasibility of PPH prevention using oxytocin injected by peripheral health care providers without midwifery skills at home births. Primary outcome was PPH, using multiple

definitions; (PPH-1) blood loss ≥ 500 mL; (PPH-2) PPH-1 plus women who received early treatment for PPH; and (PPH-3) PPH-2 plus any other women who referred to hospital for postpartum bleeding. Unsafe practice is defined as oxytocin use *before delivery of the baby*. They enrolled 689 and 897 women, respectively, into oxytocin and control arms of the trial from April 2011 to November 2012. In oxytocin and control arms, respectively, PPH-1 rates were 2.6% versus 5.5% (RR: 0.49; 95% CI: 0.27-0.88); PPH-2 rates were 3.8% versus 10.8% (RR: 0.35; 95% CI: 0.18-0.63), and PPH-3 rates were similar to those of PPH-2. Compared to women in control clusters, those in the intervention clusters lost 45.1 mL (17.7-72.6) less blood. They concluded that maternal health care planners consider adapting this model to extend the use of oxytocin into peripheral settings including, some contexts, home births.

Pantoja et al(2016)⁸ assessed the effects and safety of oxytocin provided in non-facility birth settings by any method in the third stage of labour to prevent PPH. Authors searched the “Cochrane Pregnancy and Childbirth Group's Trials Register, the WHO International Clinical Trials Registry Platform” (ICTRP), ClinicalTrials.gov (12 November 2015), and reference lists of retrieved reports. It is uncertain that if oxytocin administered by health worker in non-facility settings compared with control group reduces the incidence of severe PPH (>1000 mL), maternal morbidity or maternal mortality. However, the intervention probably decreases the incidence of PPH (> 500 mL). Further well-executed and adequately-powered randomised controlled trials assess the effects of using oxytocin in pre-

filled injection devices or any other new delivery systems such as spray-dried ultrafine formulation of oxytocin on severe PPH are urgently needed.

Garabedian C et al(2016)⁹ assesses the impact of routine injection of 5 units of oxytocin after the anterior shoulder is delivered on the incidence of postpartum haemorrhage (PPH) in a context of day to day practice. Single-centre before-and-after study evaluates the effect of a change in protocol for PPH prevention as applied in our obstetrical unit.

They also concludes that routine injection of 5 units of oxytocin makes possible to reduce the risk of moderate PPH, but it has not affect the risk of severe PPH.

Westhff G et al(2013)¹⁰ determines the effect of prophylactic oxytocin at any dose to prevent PPH and other adverse maternal outcomes which is related to the third stage of labour. Authors searched the Cochrane Pregnancy and Childbirth Group's Trials Register (31 May 2013). Randomised controlled trials including pregnant women anticipating a vaginal delivery where prophylactic oxytocin was given during management of third stage of labour. The primary outcomes are blood loss > 500 mL and the use of therapeutic uterotonics. Prophylactic oxytocin were superior to ergot alkaloids in preventing PPH greater than 500 mL (RR 0.76; 95% CI 0.61 to 0.94; five trials, 2226 women; $T^2 = 0.00$, $I^2 = 0\%$). The benefit of oxytocin over ergot alkaloids to prevent PPH greater than 500 mL only persisted in the subgroups of quasi-randomised trials (RR 0.71, 95% CI 0.53 to 0.96; three trials, 1402 women; $T^2 = 0.00$, $I^2 = 0\%$) and in trials that performed active

management of the third stage of labour (RR 0.58; 95% CI 0.38 to 0.89; two trials, 943 women; $T^2 = 0.00$, $I^2 = 0\%$). Use of prophylactic oxytocin associated with fewer side effects when compared with use of ergot alkaloids; including decreased nausea between delivery of the baby and discharge from the labour ward (RR 0.18; 95% CI 0.06 to 0.53; three trials, 1091 women; $T^2 = 0.41$, $I^2 = 41\%$) and vomiting between delivery of the baby and discharge from the labour ward (RR 0.07; 95% CI 0.02 to 0.25; three trials, 1091 women; $T^2 = 0.45$, $I^2 = 30\%$). Prophylactic oxytocin at any dose decreases both PPH greater than 500 mL and also the need for therapeutic uterotonics compared to placebo alone. Taking into account of subgroup analysis from both primary outcomes, to achieve the maximal benefit providers may opt to implement a practice of giving prophylactic oxytocin as part of the active management of the third stage of labour at a dose of 10 IU when given as an IV bolus.

Samartha ram H et al(2014)¹¹ studied that creating negative pressure inside the uterine cavity will result in shrinkage of uterus which assists the natural physiological process of contraction and retraction to stop atonic postpartum hemorrhage. Sixteen women who had normal vaginal deliveries, and 4 women who underwent caesarean sections, who developed atonic postpartum hemorrhage were included in this study. A specially designed uterine cannula measuring 25cm long and with 12/18mm diameter, with uterine angle, and with multiple perforations on uterine portion was used. When bleeding didn't stop due to uterine atony in vaginal deliveries in spite of routine measures, the uterine portion of the cannula was inserted in to uterine cavity up to fundus, and the other end was connected to

suction machine with thick walled flexible tubing. A negative pressure of 650mmHg was created inside the uterine cavity and maintained for 10mins. This procedure was repeated every hour for 3hrs. After this the negative pressure was created where there was recurrence of bleeding. Complete cessation of bleeding which was associated with contraction and firm retraction of uterus was observed in all women within 4mns after initiation of procedure. The amount of blood collected in suction bottle ranged from 150ml to 250ml. Authors concluded that Vacuum shrinking of uterus is a very effective physical method which can assist the natural physiological process of contraction and retraction to stop atonic postpartum hemorrhage. This simple, cost effective, life-saving, and fertility saving technique, which can avoid laparotomy can be made available in any setting, and can become the first defense against atonic PPH.

Bela Makhija et al(2014)¹³ conducted a retrospective observational study carried out from July 2011 to December 2012 at Batra Hospital and Medical Research Centre, New Delhi, India. Nine patients who delivered either vaginally or via caesarian section and developed primary PPH refractory to conventional medical treatment, were included in the study. Suction and evacuation of the uterine cavity was done and then the cannula was kept inside the uterine cavity for 20-30 minutes thereby maintaining negative pressure (400-600 mmHg) in the cavity. Data were retrieved from patients' hospital records. Intractable primary hemorrhage was encountered in 9 patients of whom 6 had bleeding after caesarian section and 3 after vaginal deliveries. Uterine atony due to prolonged labour was the commonest cause. Hemorrhage was effectively controlled in 8 out of 9 cases

(88.9%) and hysterectomy was avoided. In one patient (11.1%) the procedure failed and life saving hysterectomy was done to control the bleeding. This approach not only controls PPH but it also preserves the woman's reproductive functions and avoids hysterectomy and its related complications and consequences.

Authors concluded that this conservative surgical method to treat PPH in low resource settings requires minimal training, conserves the uterus, and is technically less challenging and associated with less blood loss than hysterectomy.

Purwosunu Y et al(2016)¹⁴ proposed that vacuum-induced uterine tamponade is a possible alternative approach to balloon tamponade systems for the treatment of postpartum hemorrhage resulting from atony.

In a prospective proof-of-concept investigation of 10 women with vaginal deliveries in a hospital setting who failed first-line therapies for postpartum hemorrhage, tamponade was used. Vacuum-induced uterine tamponade was created through a device inserted transvaginally into the uterine cavity. An occlusion balloon built into the device shaft was inflated at the level of the external cervical os to create a uterine seal. Negative pressure was created by attaching a self-contained, mobile, electrically powered, pressure-regulated vacuum pump with a sterile graduated canister. In all 10 cases, the suction created an immediate seal at the cervical os, 50-250 mL of residual blood was evacuated from the uterine cavity, the uterus collapsed and regained tone within minutes, and hemorrhaging was controlled. The device remained in place for a

minimum of 1 hour and up to 6.5 hours in one case while vaginal and perineal lacerations were easily repaired.

Authors concluded that a device designed to create vacuum-induced uterine tamponade may be a reasonable alternative to other devices used to treat atonic postpartum hemorrhage.

Panicker (2017)¹⁵ proposed to find a safe, simple and sure technique for preventing and treating PPH, thereby to decrease maternal mortality and morbidity, and also to find a method to treat PPH in low-resource and primary care settings where even a paramedical personnel including ANMs can use this method safely and effectively to save the life of the pregnant ladies. Forty women who had normal vaginal deliveries and fifteen women who had LSCS were included in this study during the last two-year period in a low-resource maternity hospital which has about 1000 deliveries in a year. All these 55 women developed PPH in spite of using all uterotonic drugs according to the protocol. Four women developed atonic PPH, and the blood loss was more than 1500 ml. Blood pressure, pulse rate, haemoglobin haematocrit, platelet count, clotting time and bleeding time were noted. A specially made stainless steel or plastic cannula of 12 mm in diameter and 25 cm in length with multiple holes of 4 mm diameter at the distal 12 cm of the cannula was introduced into the uterine cavity through the vagina to reach the fundus. The cannula was connected to a suction apparatus, and a negative pressure of 700 mm mercury was produced. The negative suction resulted in aspiration of all the blood collected in the uterine

cavity. The quantity of blood sucked varied from 50–300 ml. When the collected blood was completely sucked out, the bleeding ceased. The suction was maintained for 30 min. Then the cannula was taken out slowly after releasing the suction. There was no further bleeding from the uterine cavity, and the uterus was well contracted. Five patients had fresh bleeding from the vagina even after connecting the suction. These were all found to have vaginal tears, and suturing was performed.

Author concluded that strong negative suction produced in the uterine cavity by this special cannula resulted in sucking out all the blood and blood clots. The inner surface of the uterine cavity got strongly sucked by the cannula. All the bleeding vessels including arterioles and sinusoids get sucked into the holes of the cannula, thereby mechanically closing them. The bleeding points are permanently closed due to clot formation within 30–40 min. This is a very simple, safe, sure and inexpensive technique to control and cure PPH with absolute success. Instead of using suction machine, a mechanical suction unit of ventouse or MVA syringe can be used. There were no complications and no failure observed by using this device. This life-saving procedure will have a key role in bringing down maternal mortality

MATERIALS AND METHODS

Study Design : Randomised comparison study.

Sample size : 100 cases using AMTSL

100 cases using AMTSL without uterine massage

100 cases using AMTSL with vacuum Retraction cannula
excluding uterine massage.

Participants :

Inclusion criteria :

Candidates for Normal labour.

Exclusion criteria :

Lower segment caesarean section

Instrumental deliveries

Collaboration Department : Nil

Materials and methods :

Oxytocin 10 units

Vacuum retraction cannula

Suction Apparatus

Surgical drape for blood loss measurement

Methods:

300 pregnant mothers, delivered by Labour Natural in Government Rajaji Hospital is taken in this study. In this study, patients are selected randomly, among 300 patients all sorted into three groups, randomly 100 patients are selected for AMTSL alone during third stage of labour, 100 patients are candidates for Cannula

insertion during third stage of labour, of these they again subdivided randomly into three subgroups for same pressure maintenance for different durations of 5 mins, 10 mins, 15 mins, 100 patients are selected for AMTSL without uterine massage in third stage of labour. Informed and written consent was obtained from all patients who participated in this study. This study conforms to the standards of Helsinki declarations.

DESCRIPTION ABOUT VACUUM RETRACTION CANNULA:

It is also known as Panicker's PPH suction haemostatic cannula. This is 25cm long, 12mm diameter. Multiple holes 5mm diameter at distal 12cms. Cannula is connected to a connector and fixed in the suction apparatus. After introducing cannula 650mm Hg negative pressure applied. Pressure is created within a minute. By creating negative pressure, wall of the uterine cavity is strongly sucked into the small holes of the cannula thereby closing all the bleeding sinusoids and arterioles. Thus it aids in natural physiological process of contraction and retraction to prevent atonicity.



VACUUM RETRACTION CANNULA



VACUUM RETRACTION CANNULA



SUCTION APPARATUS



SURGICAL DRAPE

AMTSL:

As per WHO recommendation,AMTSL is followed,after delivery of the baby inj Oxytocin 10 units IM given,then controlled cord traction done & placenta is removed,Uterine massage is done and blood loss is measured using the surgical drape.

AMTSL with Vacuum retraction Cannula excluding uterine massage :

Informed oral and written consent is obtained from the patient. After delivery of the baby inj Oxytocin 10 units IM given, controlled cord traction done & placenta is removed. After removal of placenta, wide blade vaginal Sims speculum is applied to retract posterior vaginal wall, then anterior lip of cervix grasped with ring forceps, uterine end of cannula is introduced into lower uterine cavity, avoid touching the walls of vagina, then remove the ring forceps, move the hand to lower segment of uterus (base of hand on lower part of body of uterus and fingers towards fundus) and gently push the uterus upward to extend the lower uterine segment and facilitate entry of the cannula upto to the level of fundus gently. Then cannula is fit to the suction apparatus with connector and suction tube,precaution to be done to look for air leak so that to create sufficient negative pressure.Suction apparatus is on after confirming the position of cannula and pressure of 650 mg Hg is created within one minute and study is done in maintaining the pressure for three different duration 5 mins,10 mins,15 mins. Then suction machine is switched off.Then cannula is gently removed after pressure reached 0 mm Hg. Blood loss is assessed by measuring blood collected in surgical

drape and inside suction apparatus. Patient is monitored by vitals and uterine tone and blood loss per vagina.

AMTSL without uterine massage:

Informed oral and written consent is obtained from the patient. After delivery of the baby, Inj. Oxytocin 10 units IM given, controlled cord traction done but uterine massage is not done, then the blood loss is assessed by using surgical drape.

The results derived after comparison were tabulated and analysis done depending on the P value for each comparable variable.

Study variable : various modes of intervention for PPH.

Outcome variable : quantity of blood loss

Chisquare test : P value < 0.05 denotes significant association is present between study variable and outcome variable.

OBSERVATIONS

This study was conducted in Govt Rajaji hospital, Madurai, attached to Madurai medical college, Madurai. In this randomised control study we compared three groups of patients, each comprises of 100 in number. We asked details of patients before delivery and after delivery by using pretested questionnaire. Following were the observations of the study.

TABLE-I

**DISTRIBUTION OF PATIENTS ACCORDIING TO
AGE**

Age group (in yrs)	No. (%)
19 - 25	193 (64.4)
26 – 30	85 (28.3)
31 – 36	22 (7.3)
Total	300 (100.0)

Table-I shows frequency distribution of patients according to age. In our study, 64.4% of patients were between 19 to 25yrs and only 7.3% of patients were between 31 to 36 yrs. Rest (28.3%) consisted of age between 26 to 30yrs.

DISTRIBUTION OF PATIENTS ACCORDIING TO

AGE

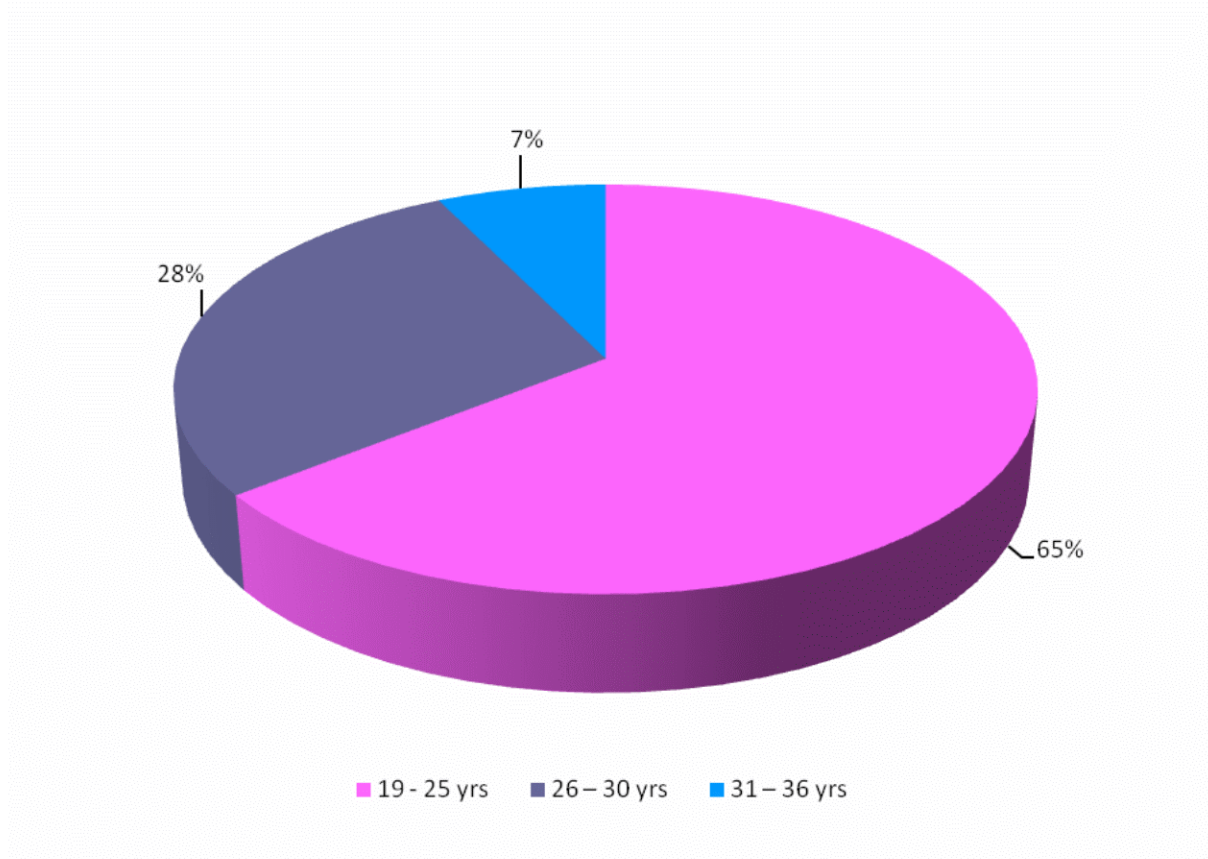


TABLE-II
DISTRIBUTION OF PATIENTS ACCORDING TO OBSTETRIC CODE

Obstetric Code	No. (%)
Primi	135 (45.0)
Multi	165 (55.0)
Total	300 (100.0)

Table-II shows the distribution of patients according to obstetric code. As we see, in our study 45% were primigravidae and 55% were multigravidae.

DISTRIBUTION OF PATIENTS ACCORDING TO OBSTETRIC CODE

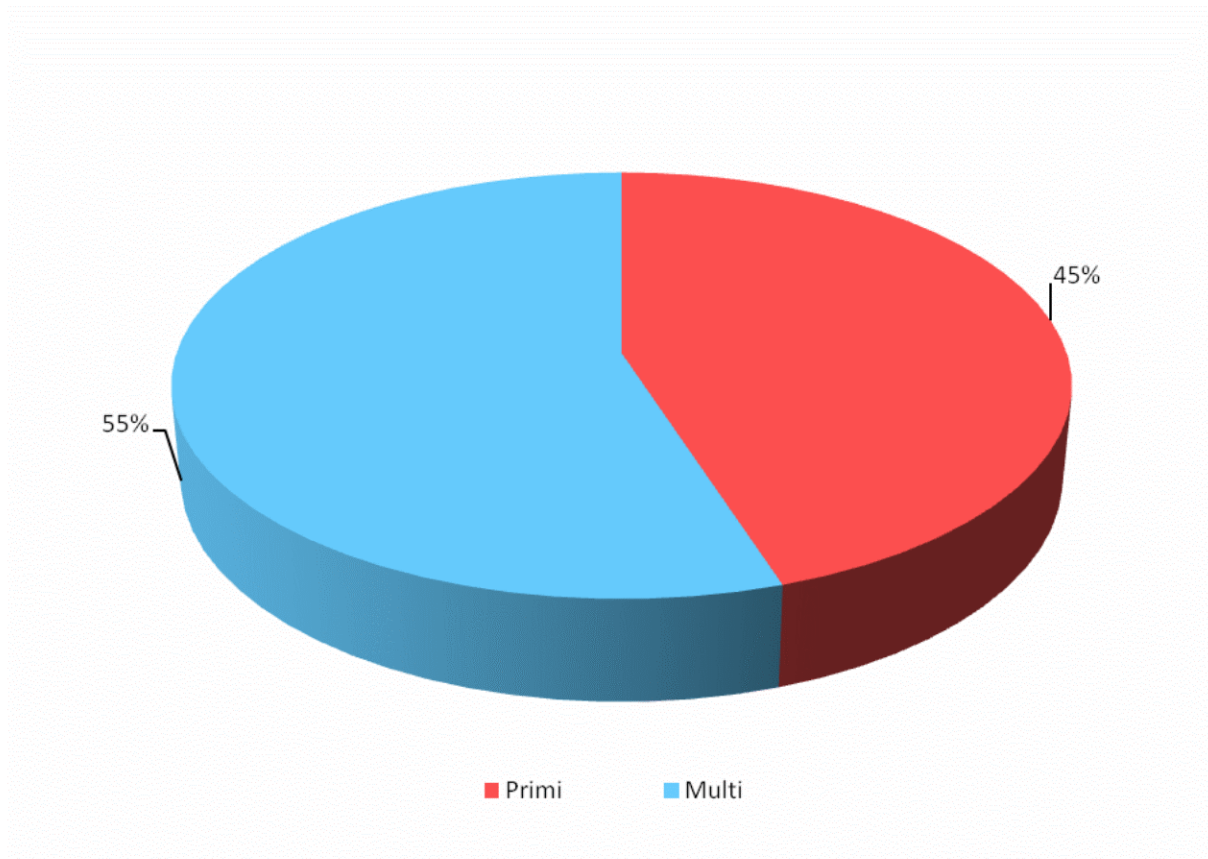


TABLE-III
DISTRIBUTION OF PATIENTS ACCORDING TO GESTATIONAL AGE

Gestational Age	No. (%)
<37 weeks	50 (16.7)
≥37 weeks	250 (83.3)
Total	300 (100.0)

Table-III shows Gestational age distribution of patients in our study. 83.3% of patients in study group were bearing term gestation and only 16.7% were <37weeks gestation.

DISTRIBUTION OF PATIENTS ACCORDING TO GESTATIONAL AGE

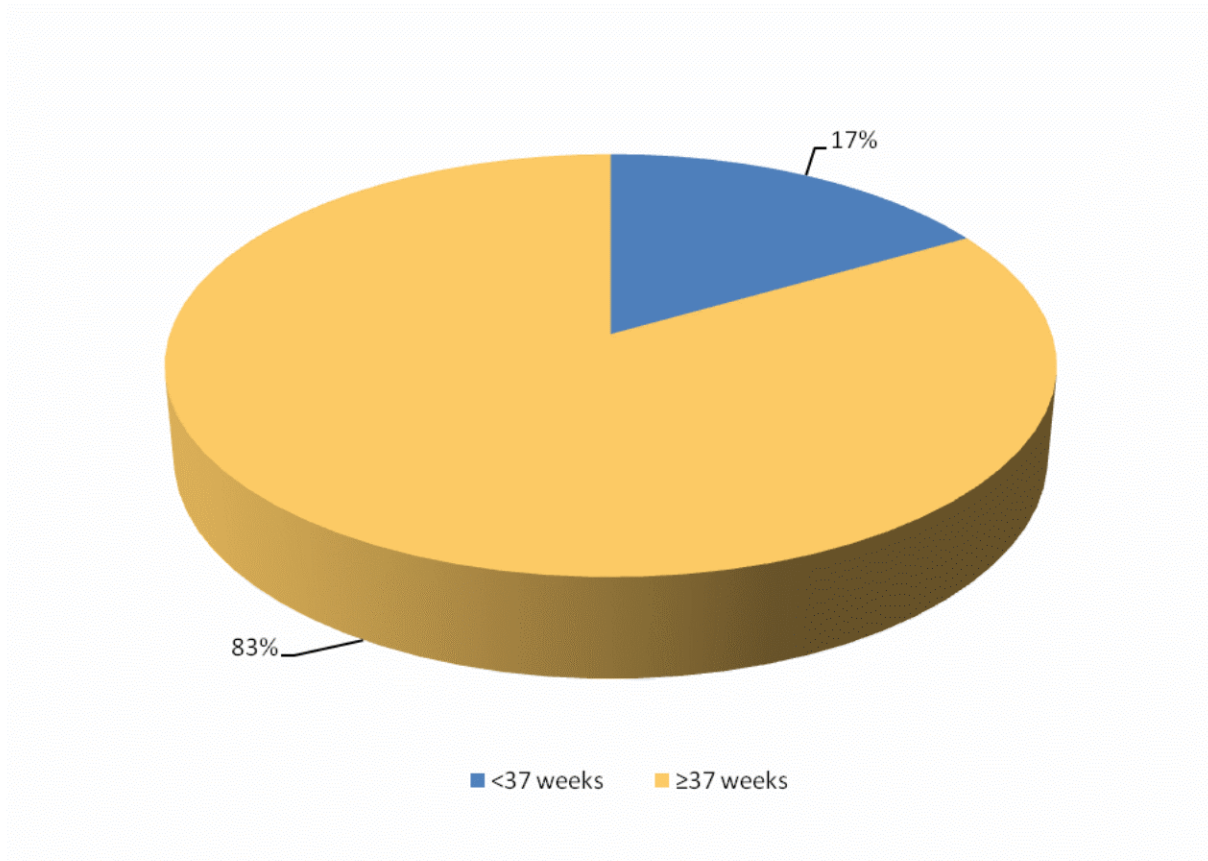


TABLE-IV

DATA OF STUDYGROUPS ACCORDING TO PROCEDURE

Procedure	No. (%)
AMTSL	100 (33.3)
AMTSL with Cannula excluding uterine massage	100 (33.3)
AMTSL without Uterine Massage	100 (33.3)
Total	300 (100.0)

Table-IV shows frequency distribution of three patient groups in equal numbers like AMTSL only, AMTSL with cannula excluding uterine massage, AMTSL without uterine massage . As already mentioned each group is divided into 100(33.3%) patients.

DATA OF STUDY GROUPS ACCORDING TO PROCEDURE

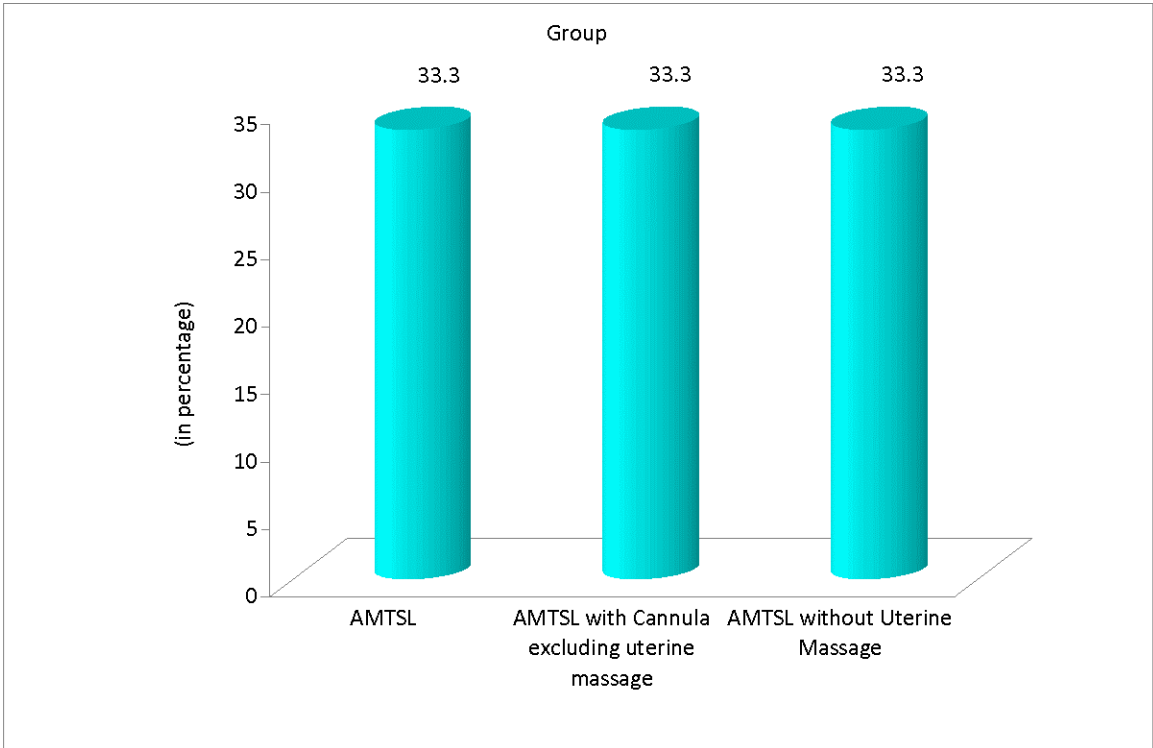


TABLE-V

**DISTRIBUTION OF CASES ACCORDING TO CANNULA APPLICATION
TIME**

AMTSL with Cannula excluding uterine massage	No. (%)
Pressure at 5 mins	30 (30.0)
Pressure at 10 mins	30 (30.0)
Pressure at 15 mins	40 (40.0)
Total	100 (100.0)

Table-V shows distribution of cases according to cannula application time at same pressure of 650 mmHg after delivery of placenta in three sub-groups of patients with cannula. Here 30% each of patients are maintained for 5 and 10 minutes. Rest of the 40% patients were maintained pressure upto 15min.

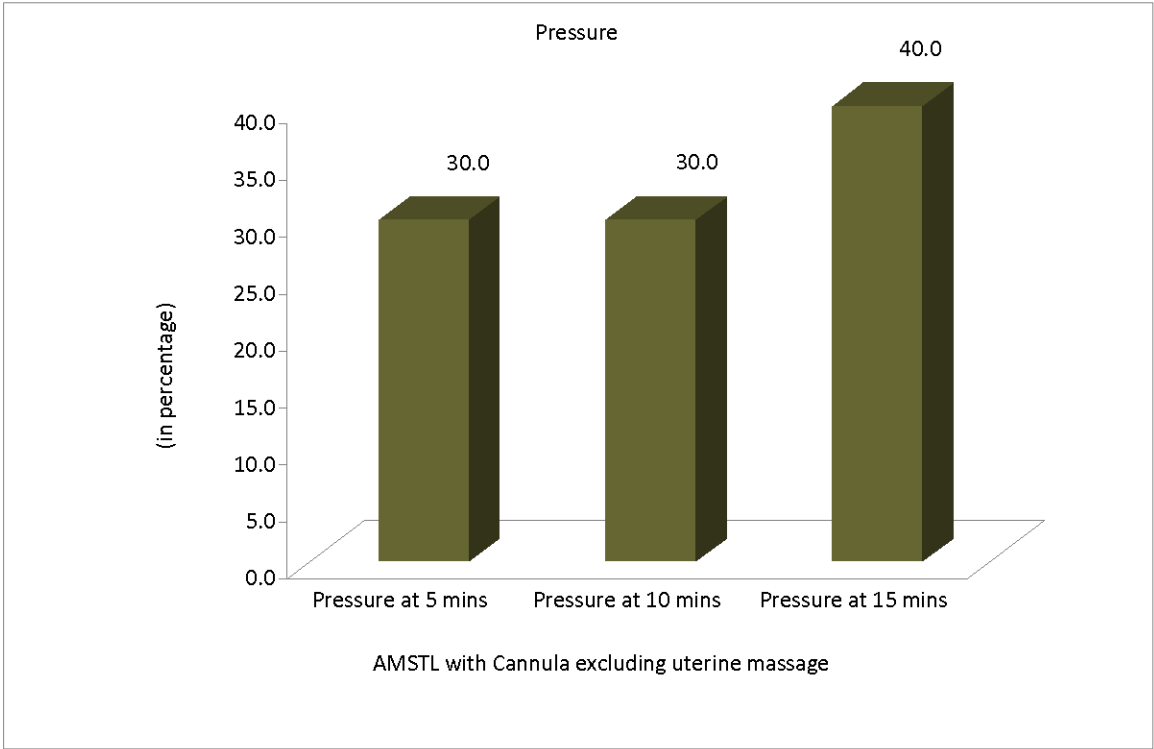


TABLE-VI**COMPARISION OF DATA ACCORDING TO AGE IN STUDY GROUPS**

Age group (in yrs)	Group		
	AMTSL	AMTSL with Cannula excluding uterine massage	AMTSL without Uterine Massage
19 - 25	61 (61.0)	72 (72.0)	60 (60.0)
26 – 30	37 (37.0)	17 (17.0)	31 (31.0)
31 – 36	2 (2.0)	11 (11.0)	9 (9.0)
Total	100 (100.0)	100 (100.0)	100 (100.0)

Table-VI shows distribution of data according to age in all three study groups. In all three groups, patients with age between 19-25yrs contributed more to study. The values were 61%, 72%, 60% for AMTSL only, AMTSL with cannula excluding uterine massage, AMTSL without uterine massage respectively. Age range between 31-36 was contributed 2%, 11%, 9% respectively.

COMPARISON OF DATA ACCORDING TO AGE IN STUDY GROUPS

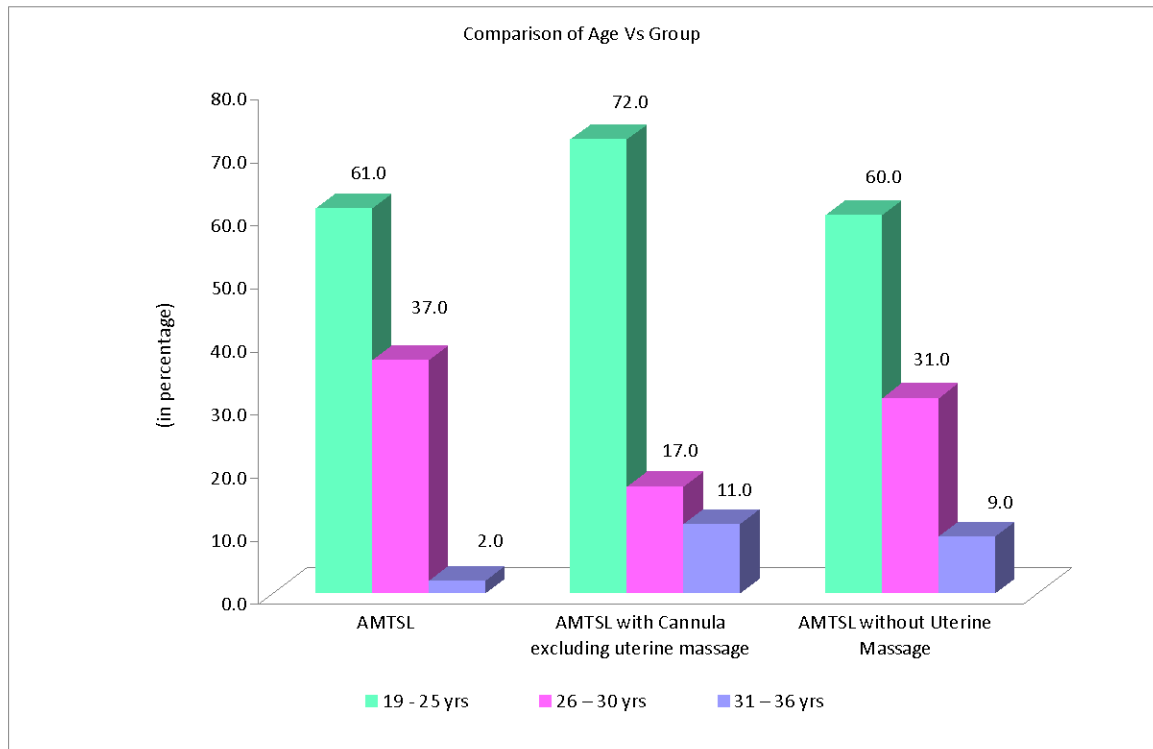


TABLE-VII

DEMOGRAPHIC DATA OF PATIENTS ACCORDING TO UTERINE TONE

Uterine Tone	No. (%)
Firm	287 (95.7)
Atonic	13 (4.3)
Total	300 (100.0)

Table-VII shows comparison of patients in our study according to uterine tone while performing the procedure after delivery. Of the 300 patients 287(95.7%) were having firm uterine tone and only 13(4.3%) were having atonic uterus.

DEMOGRAPHIC DATA OF PATIENTS ACCORDING TO UTERINE TONE

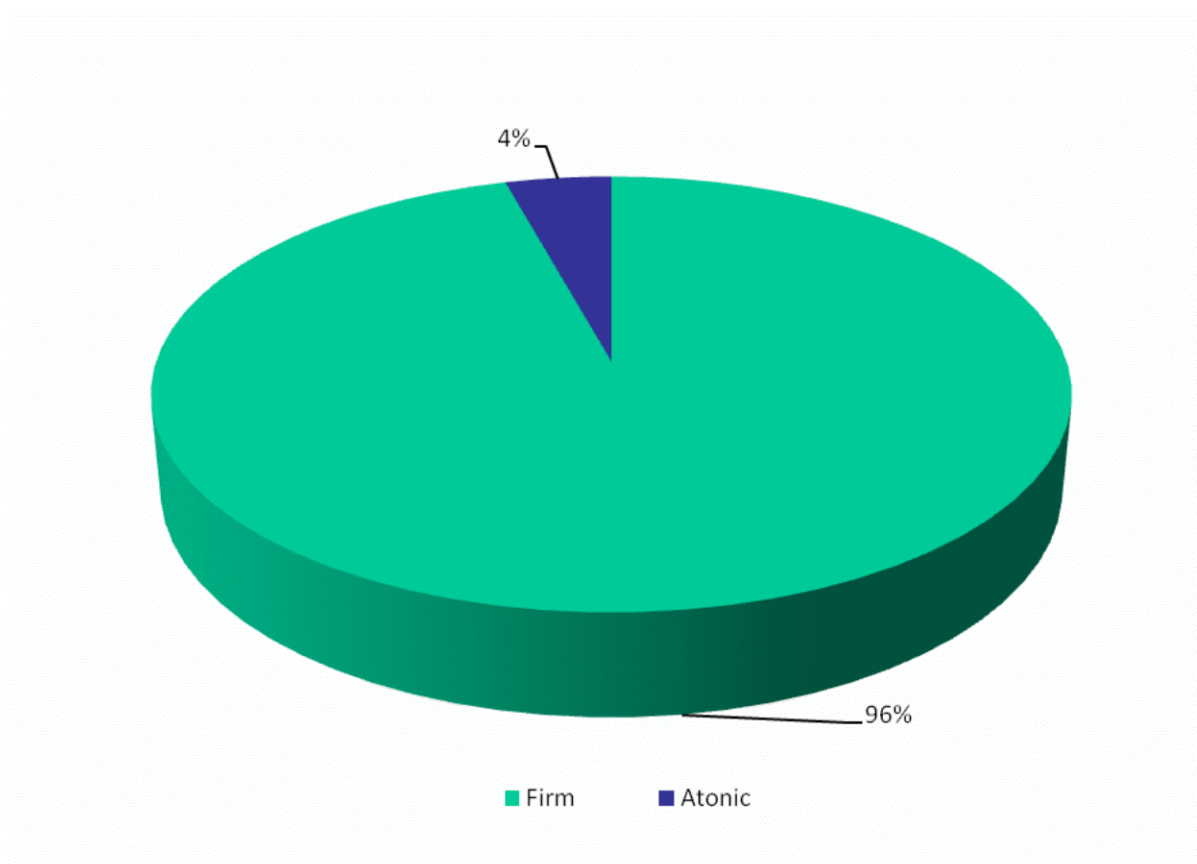


TABLE-VIII
DISTRIBUTION OF CASES ACCORDING TO ANTENATAL
HEMOGLOBIN

	Group		
	AMTSL	AMTSL with Cannula excluding uterine massage	AMTSL without Uterine Massage
	Mean \pm SD	Mean \pm SD	Mean \pm SD
Antenatal HB (in g/dl)	9.4 \pm 0.3	9.3 \pm 0.3	9.3 \pm 0.2

Table-VIII shows mean haemoglobin values of each group. All patients in each group were having Hb of around 9.3 -9.4g% antenatally in our study.

DISTRIBUTION OF CASES ACCORDING TO ANTENATAL HEMOGLOBIN

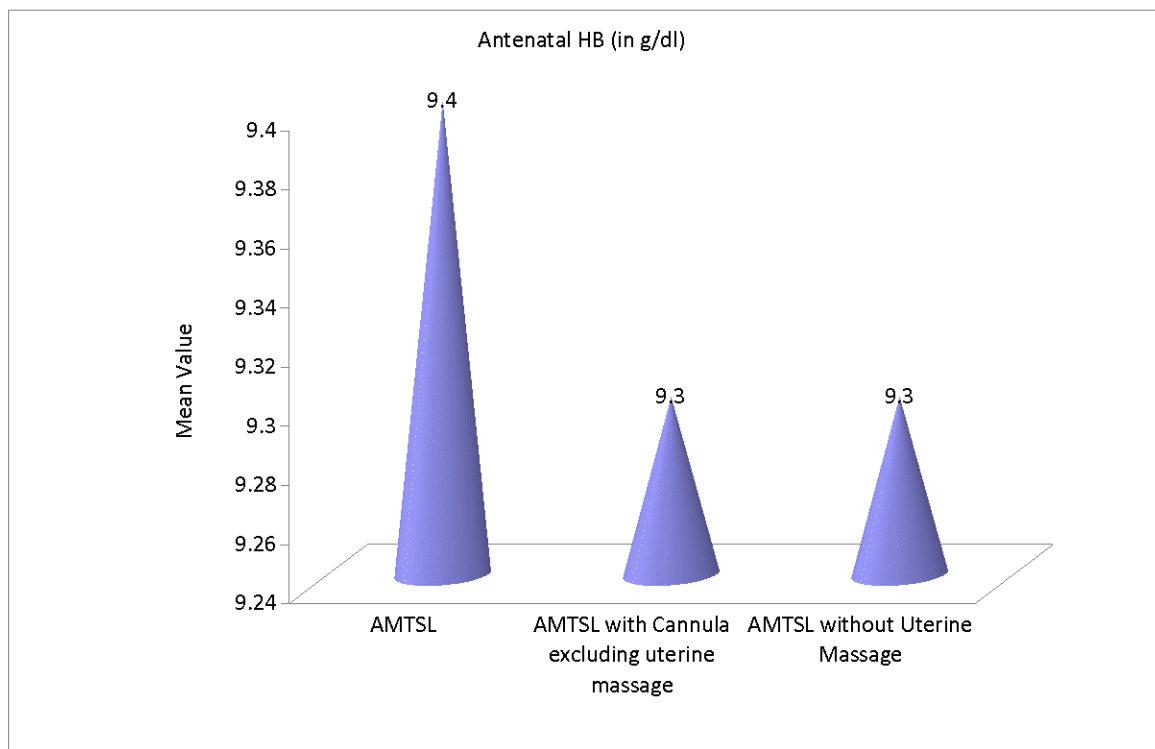


TABLE-IX
DISTRIBUTION OF CASES ACCORDING TO POSTPARTUM
HEMOGLOBIN

	Group		
	AMTSL	AMTSL with Cannula excluding uterine massage	AMTSL without Uterine Massage
Postpartum HB (in g/dl)	9.1 ± 0.3	9.1 ± 0.2	9.1 ± 0.1

Table-IX shows plotting of postpartum mean haemoglobin values in each of the three groups. Postpartum haemoglobin values were lying around 9.1g in all three groups.

**DISTRIBUTION OF CASES ACCORDING TO POSTPARTUM
HEMOGLOBIN**

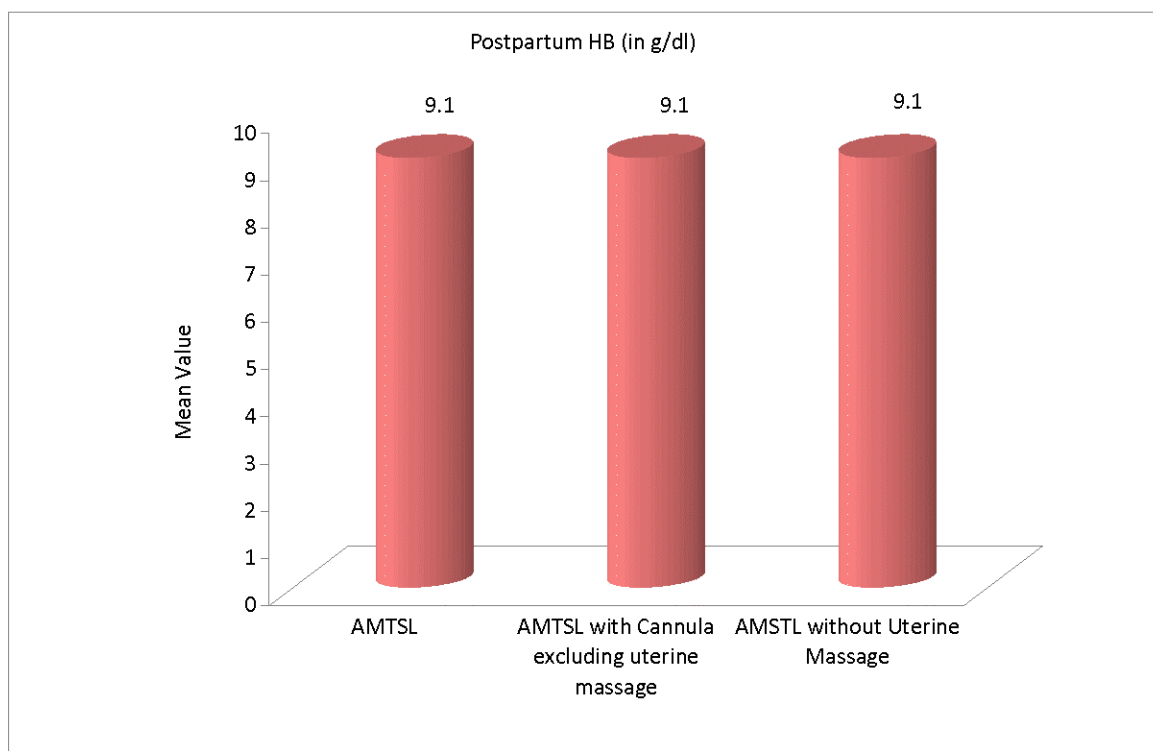


TABLE-X

COMPARISION DATA ACCORDING TO BLOOD LOSS IN GROUPS

	Group		
	AMTSL	AMTSL with Cannula excluding uterine massage	AMTSL without Uterine Massage
	Mean ± SD	Mean ± SD	Mean ± SD
Blood Loss (in ml)	299.0 ± 103.0	223.6 ± 99.2	280.8 ± 119.5
P value	<0.001 (Significant)		

Table-X shows the comparison between groups according to blood loss following delivery after performing particular procedure allotted to each group of patients. In group with AMTSL only, mean blood loss was 299ml and in with cannula group blood loss was 223ml only. In last group, AMTSL without uterine massage, blood loss was 281ml. P value is <0.001 which is statistically significant.

COMPARISION DATA ACCORDING TO BLOOD LOSS IN GROUPS

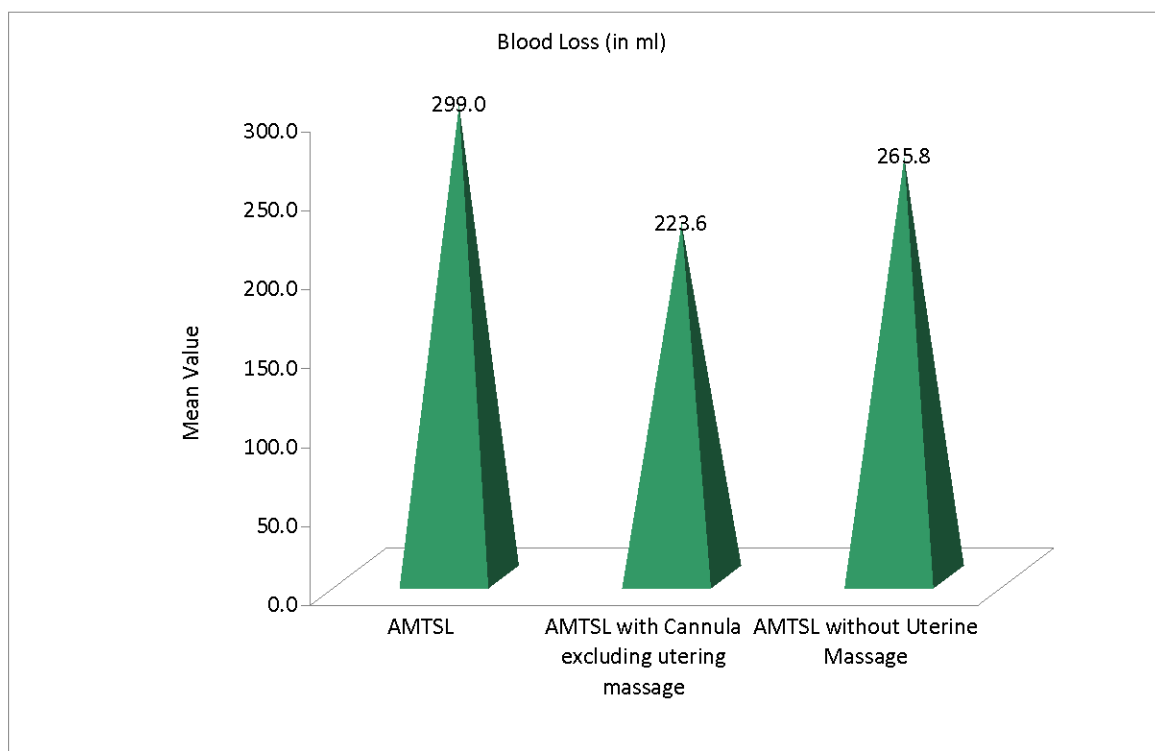


TABLE-XI
COMPARISION OF DATA BETWEEN UTERINE TONE AND STUDY
GROUPS

Uterine Tone	Group			Total
	AMTSL	AMTSL with Cannula excluding uterine massage	AMTSL without Uterine Massage	
	No.	No.	No.	
Firm	95	96	96	287
Atonic	5	4	4	13
P value	0.923 (Not Significant)			

Table- XI shows frequency distribution of study groups according to uterine tone. Uterine tone was firm in 95% of AMTSL only, 96% of AMTSL with cannula excluding uterine massage and 96% of AMTSL without uterine massage. Only 5%, 4%, 4% of AMTSL only, AMTSL with cannula excluding uterine massage and 96% of AMTSL without uterine massage respectively were atonic uterus. While comparing the atonicity among groups 30.8% occurred in both groups of AMTSL with cannula excluding uterine massage & AMTSL without uterine massage group. But in AMTSL only group atonicity constitutes about 38.5% but it is not statistically significant.

COMPARISON OF DATA BETWEEN UTERINE TONE AND STUDY GROUPS

COMPARISON OF DATA BETWEEN UTERINE TONE AND STUDY GROUP

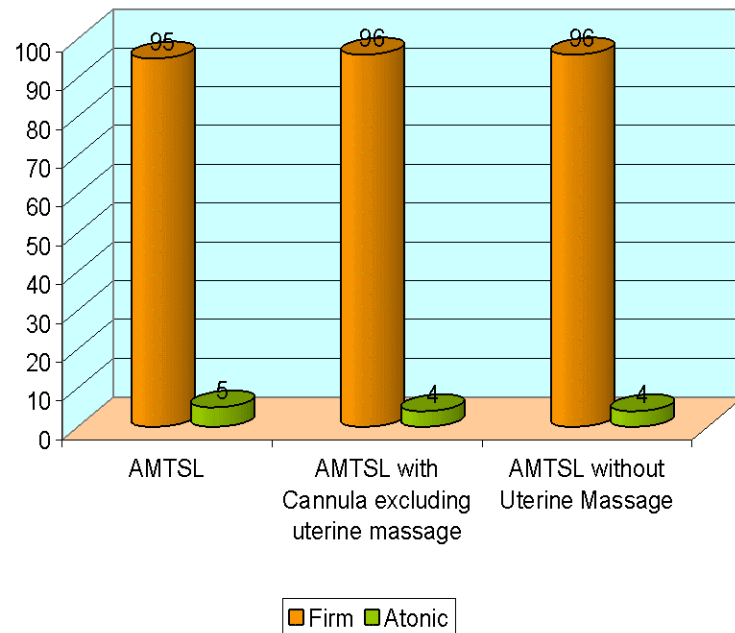


TABLE-XIII

**COMPARISON OF DATA ACCORDING TO UTERINE TONE IN
AMTSL WITH CANNULA EXCLUDING UTERINE MASSAGE GROUP**

Uterine Tone	Pressure			Total
	At 5 mins	At 10 mins	At 15 mins	
	No. (%)	No. (%)	No. (%)	
Firm	27 (28.1)	30 (31.3)	39 (40.6)	96 (100.0)
Atonic	3 (75.0)	-	1 (25.0)	4 (100.0)
P value	0.117 (Not Significant)			

Table-XIII shows comparison of uterine tone in AMTSL with cannula excluding uterine massage study group. In this group, Most of the patients were maintaining the firm uterine tone with the value of 96%. Only 4% were having Atonic uterus. Out of 96% of patients with firm tone, according to the application time of pressure through cannula inside uterus, 28.1%, 31.3%, 40.6% were needed respectively 5, 10, 15min duration. The P value for this analysis according to time duration of pressure application is 0.117 which is not statistically significant.

**COMPARISON OF DATA ACCORDING TO UTERINE TONE IN AMTSL WITH
CANNULA EXCLUDING UTERINE MASSAGE GROUP**

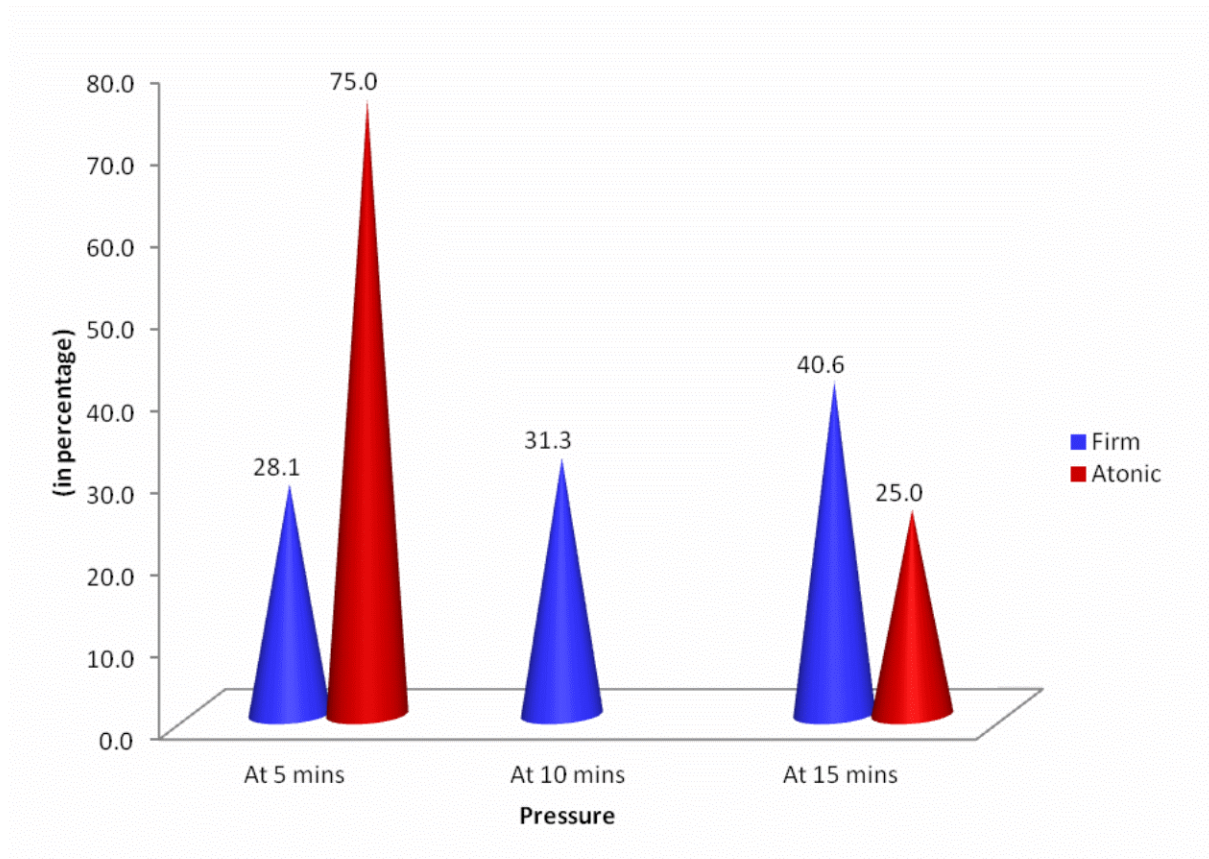


TABLE-XIV**COMPARISON ACCORDING TO MEAN BLOOD LOSS AND AGE RANGE**

Age group (in yrs)	Group			P Value
	AMTSL	AMTSL with Cannula excluding uterine massage	AMTSL without Uterine Massage	
	Mean ± SD	Mean ± SD	Mean ± SD	
19 - 25	302.3 ± 109.1	223.8 ± 93.5	246.0 ± 102.7	<0.001
26 – 30	297.3 ± 94.1	209.4 ± 33.6	290.6 ± 135.4	0.013
31 – 36	230.0 ± 84.8	243.6 ± 181.4	312.2 ± 150.3	0.618

TABLE-XIV shows comparison of data according to mean blood loss and age range of three study groups. In patients with age range between 19-25yrs, mean blood loss after AMTSL with cannula excluding uterine massage was 223.8ml which is lower than other two groups –AMTSL, AMTSL without uterine massage whose mean blood loss were 302, 246ml respectively with P value of <0.001 which is statistically significant.

In 26-30 age range, mean blood loss of all three groups were 297, 209, 290ml respectively for AMTSL only, AMTSL with cannula excluding uterine massage AMTSL without uterine massage group. Here also P value is 0.013 which is statistically significant for cannula group.

In age range 31-36yrs values of blood loss were not significant with the P value of 0.618 in all three study groups.

COMPARISON ACCORDING TO MEAN BLOOD LOSS AND AGE RANGE

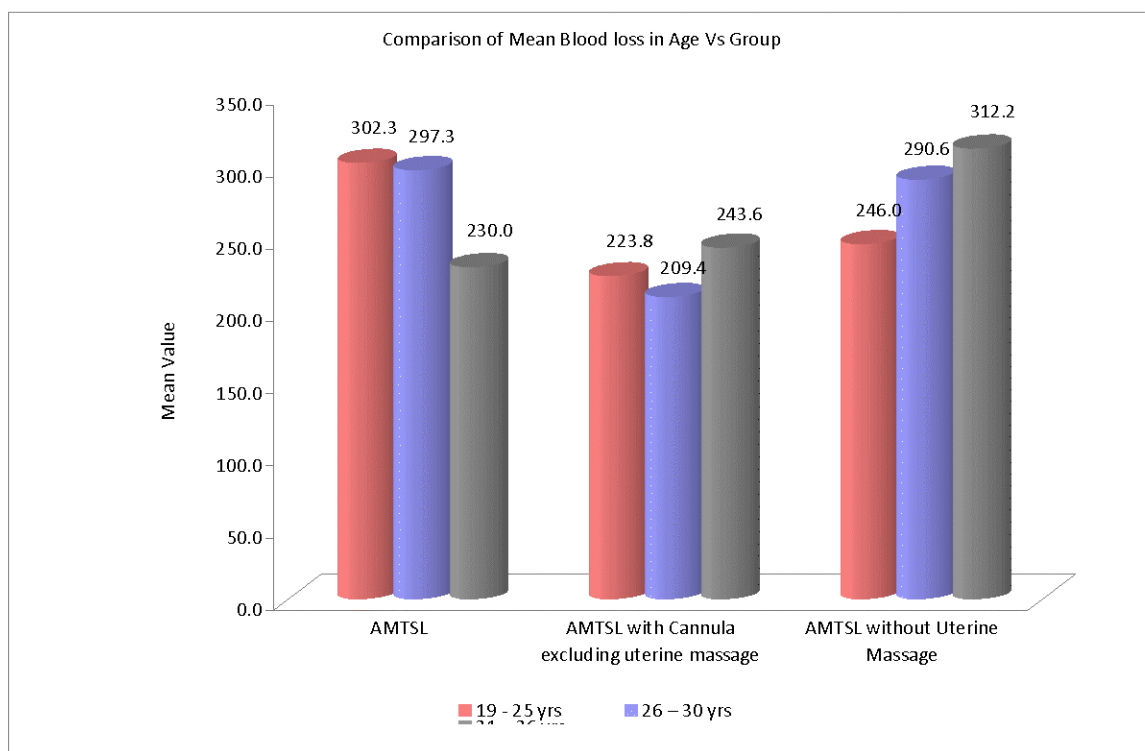


TABLE-XV
COMPARISON ACCORDING TO MEAN BLOOD LOSS AND
GESTATIONAL AGE

Gestational Age	Group			P Value
	AMTSL	AMTSL with Cannula excluding uterine massage	AMTSL without Uterine Massage	
	Mean ± SD	Mean ± SD	Mean ± SD	
< 37 week	301.1 ± 62.5	255.0 ± 148.4	254.1 ± 127.5	0.422
≥ 37 weeks	298.5 ± 109.7	217.6 ± 86.8	268.1 ± 118.5	<0.001

Table-XV shows comparison of data according to mean blood loss and gestational age of patients in all three study groups. Here patients of GA <37 weeks were having mean blood loss of 301, 255, 254ml respectively in AMTSL only, AMTSL with cannula excluding uterine massage, AMTSL without uterine massage group with insignificant P value of 0.422.

But those with GA ≥ 37 weeks were having blood loss of 298, 217, 268ml respectively in AMTSL only, AMTSL with cannula excluding uterine massage, AMTSL without uterine massage group with P value of <0.001 which is statistically significant for cannula group.

COMPARISON ACCORDING TO MEAN BLOOD LOSS AND GESTATIONAL AGE

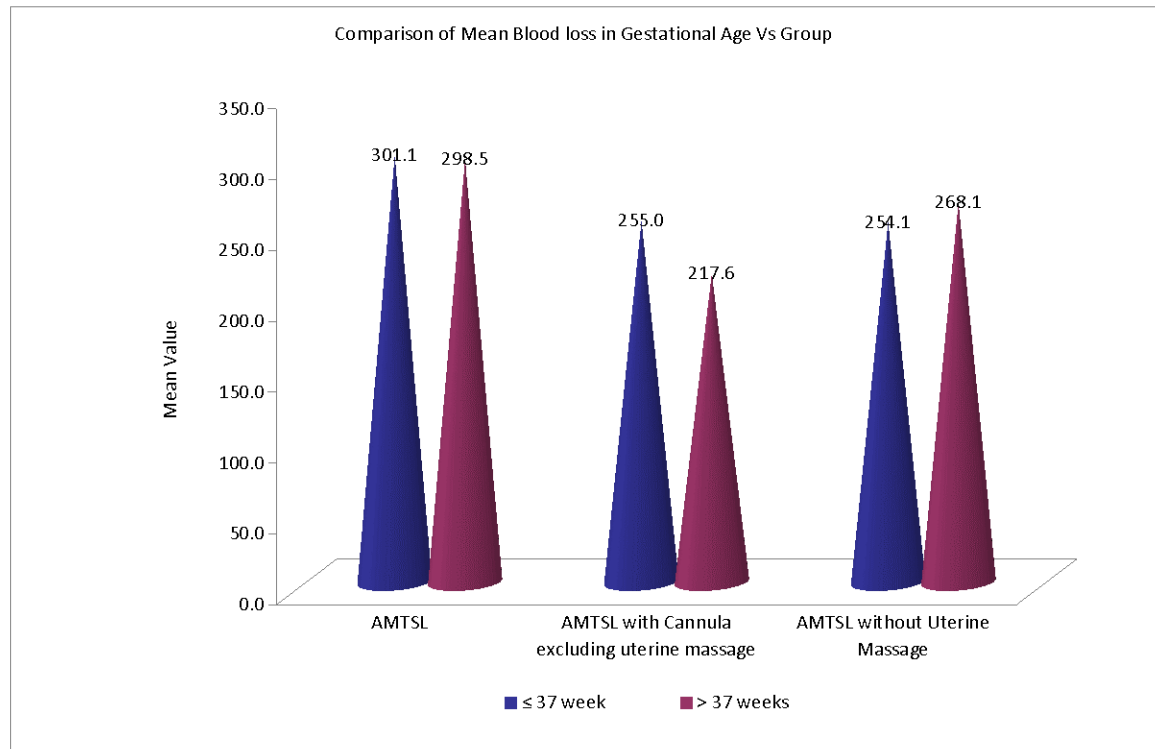


TABLE-XVI**COMPARISION BETWEEN OBSTETRIC CODE AND STUDY GROUPS**

Obstetric Code	Group			P Value
	AMTSL	AMTSL with Cannula excluding uterine massage	AMTSL without Uterine Massage	
	Mean ± SD	Mean ± SD	Mean ± SD	
Primi	310.5 ± 115.9	205.6 ± 66.0	251.4 ± 124.9	<0.001
Multi	292.5 ± 95.3	255.5 ± 135.5	273.5 ± 116.8	0.284

Table-XVI shows comparison of obstetric code of patients in each study groups. In primigravidae mean blood loss was 310, 205, 251ml 268ml respectively in AMTSL only, AMTSL with cannula excluding uterine massage, AMTSL without uterine massage group with P value of <0.001 which is statistically significant for cannula group.

In multigravidae, mean blood loss was 292, 255, 273ml respectively in AMTSL only, AMTSL with cannula excluding uterine massage, AMTSL without uterine massage group with P value of 0.284 which is not significant.

COMPARISON BETWEEN OBSTETRIC CODE AND STUDY GROUPS

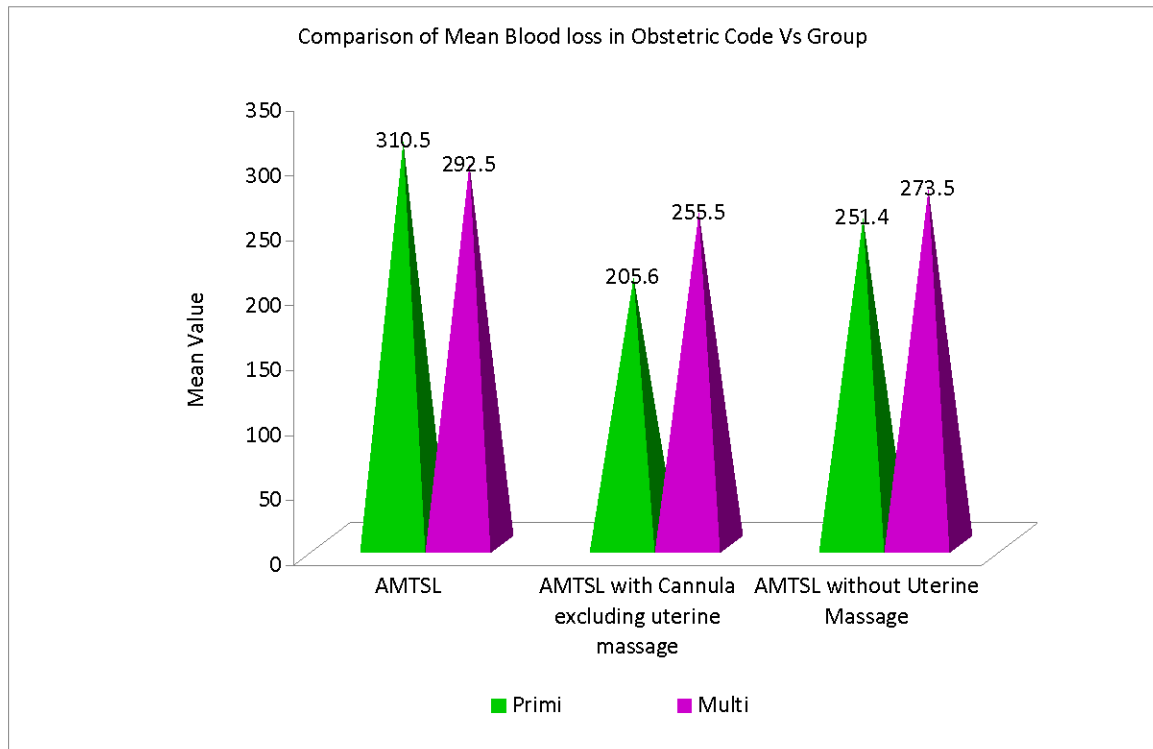


TABLE-XVII

**COMPARISION OF MEAN BLOOD LOSS BEWEEN SUB-GROUPS
WITHIN AMTSL WITH CANNULA EXCLUDING UTERINE MASSAGE**

	AMTSL with Cannula excluding uterine massage			P Value
	Pressure at 5 mins	Pressure at 10 mins	Pressure at 15 mins	
	Mean ± SD	Mean ± SD	Mean ± SD	
Blood Loss	273.3 ± 150.7	194.0 ± 28.4	208.5 ± 68.6	0.003

Table-XVII shows comparison of blood loss according to cannula application time within AMTSL with cannula excluding uterine massage group. Mean blood loss was 273ml if pressure was maintained for 5min and 194 and 208ml respectively if pressure was maintained for 10 and 15minutes. P value was 0.003 which is statistically significant

**COMPARISON OF MEAN BLOOD LOSS BETWEEN SUB-GROUPS
WITHIN AMTSL WITH CANNULA EXCLUDING UTERINE MASSAGE**

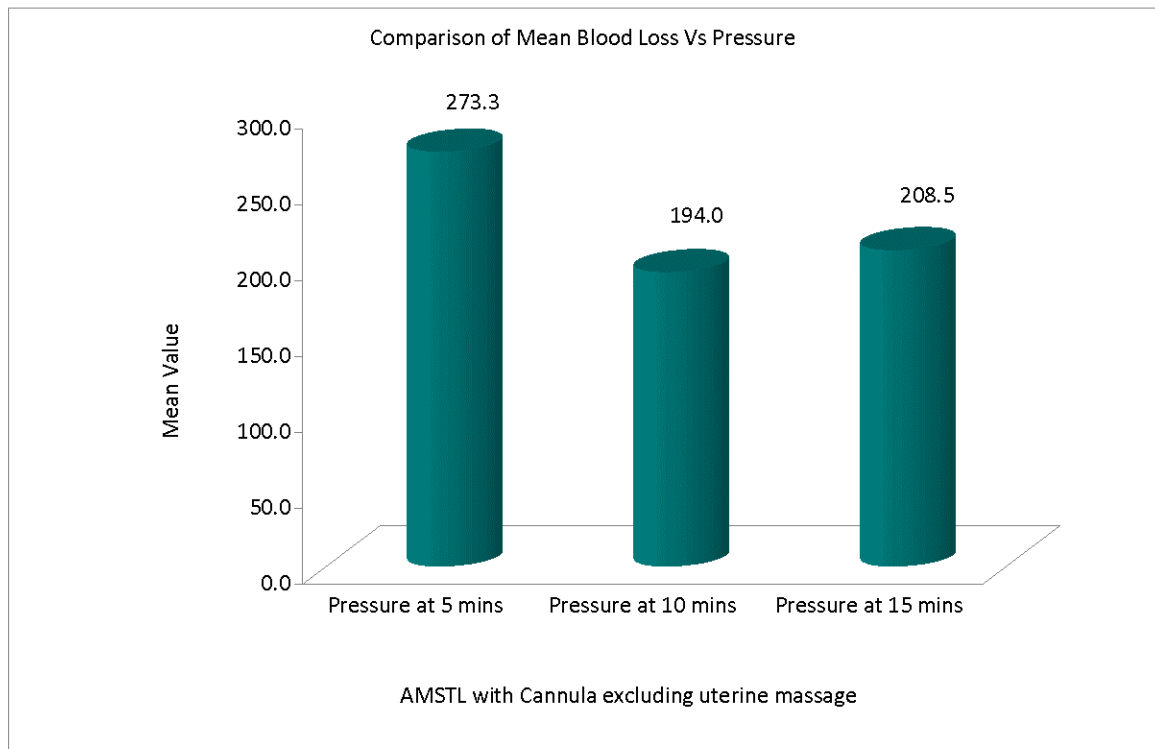


TABLE-XVIII

**DEMOGRAPHIC DATA ACCORDING TO ANTENATAL AND
POSTNATAL HB IN STUDY GROUPS**

Group	Antenatal HB	Postpartum HB
	(in g/dl)	(in g/dl)
	Mean ± SD	Mean ± SD
AMTSL	9.4 ± 0.3	9.1 ± 0.3
AMTSL with Cannula excluding uterine massage	9.3 ± 0.3	9.1 ± 0.2
AMTSL without Uterine Massage	9.3 ± 0.2	9.1 ± 0.1

Table-XVIII shows distribution of data according to antenatal and post natal mean haemoglobin all study groups. Mean antenatal HB of all three groups were lying between 9.3-9.4g/dl and postpartum HB of all three groups were lying between 9.0 to 9.1g/dl. P value is not significant for cannula group.

DEMOGRAPHIC DATA ACCORDING TO ANTENATAL AND POSTNATAL HB IN STUDY GROUPS

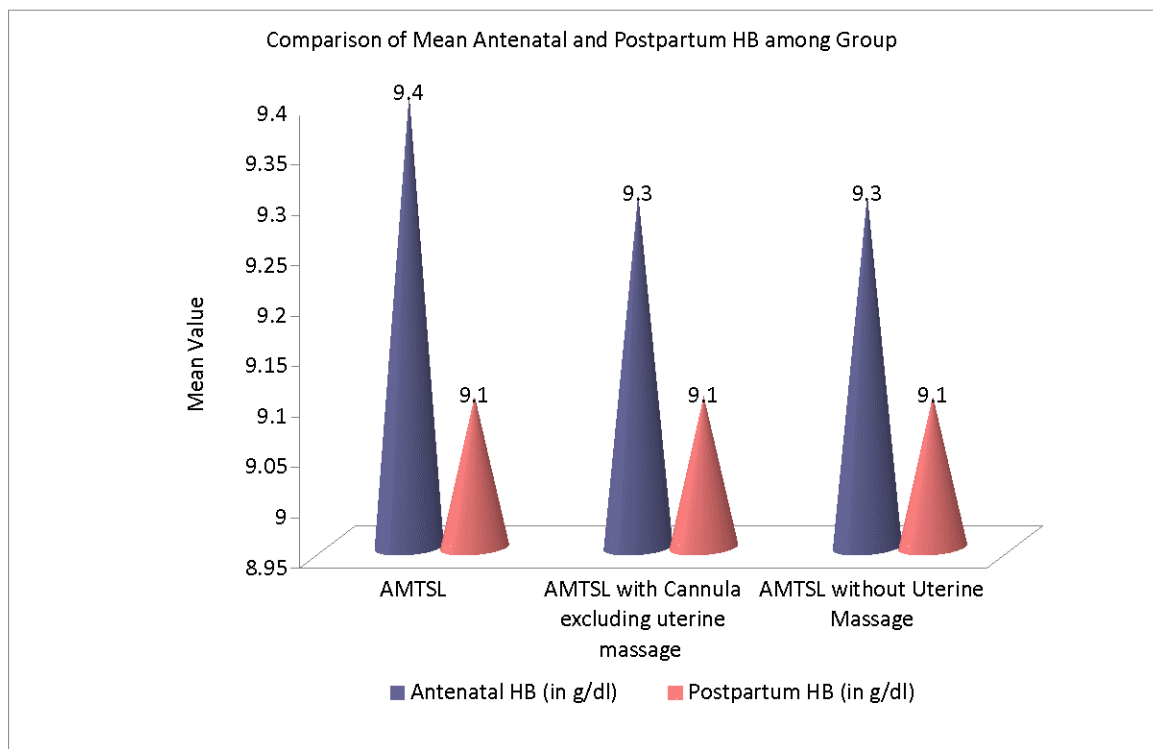


TABLE-XIX
COMPARISON OF QUANTITY OF BLOOD LOSS BETWEEN STUDY
GROUPS

Blood Loss	Group		
	AMTSL	AMTSL with Cannula excluding uterine massage	AMTSL without Uterine Massage
	No. (%)	No. (%)	No. (%)
<200	12 (12.0)	43 (43.0)	25 (25.0)
200 – 300	45 (45.0)	52 (52.0)	50 (50.0)
300 – 400	35 (35.0)	1 (1.0)	19 (19.0)
400 – 500	3 (3.0)	-	1 (1.0)
500 – 600	2 (2.0)	1 (1.0)	-
600 – 700	3 (3.0)	2 (2.0)	3 (3.0)
700 – 800	-	1 (1.0)	2 (2.0)
Total	100 (100.0)	100 (100.0)	100 (100.0)
P Value	<0.001		

Table XIX shows out of 100 patients in AMTSL only group, about 45% were having blood loss of 200-300ml, 12% were having <200ml and 35% had 300-400ml blood loss. Out of next 100 patients within AMTSL with cannula excluding uterine massage group, 43% had <200ml blood loss and 52% had blood loss of 200-300ml which is altogether contributed to 95% of blood loss. In the last 100 patients within AMTSL without uterine massage group, 50% had 200-300ml blood loss and only 25% had <200ml blood loss. P value is <0.001 which is statistically significant.

COMPARISON OF QUANTITY OF BLOOD LOSS BETWEEN STUDY GROUPS

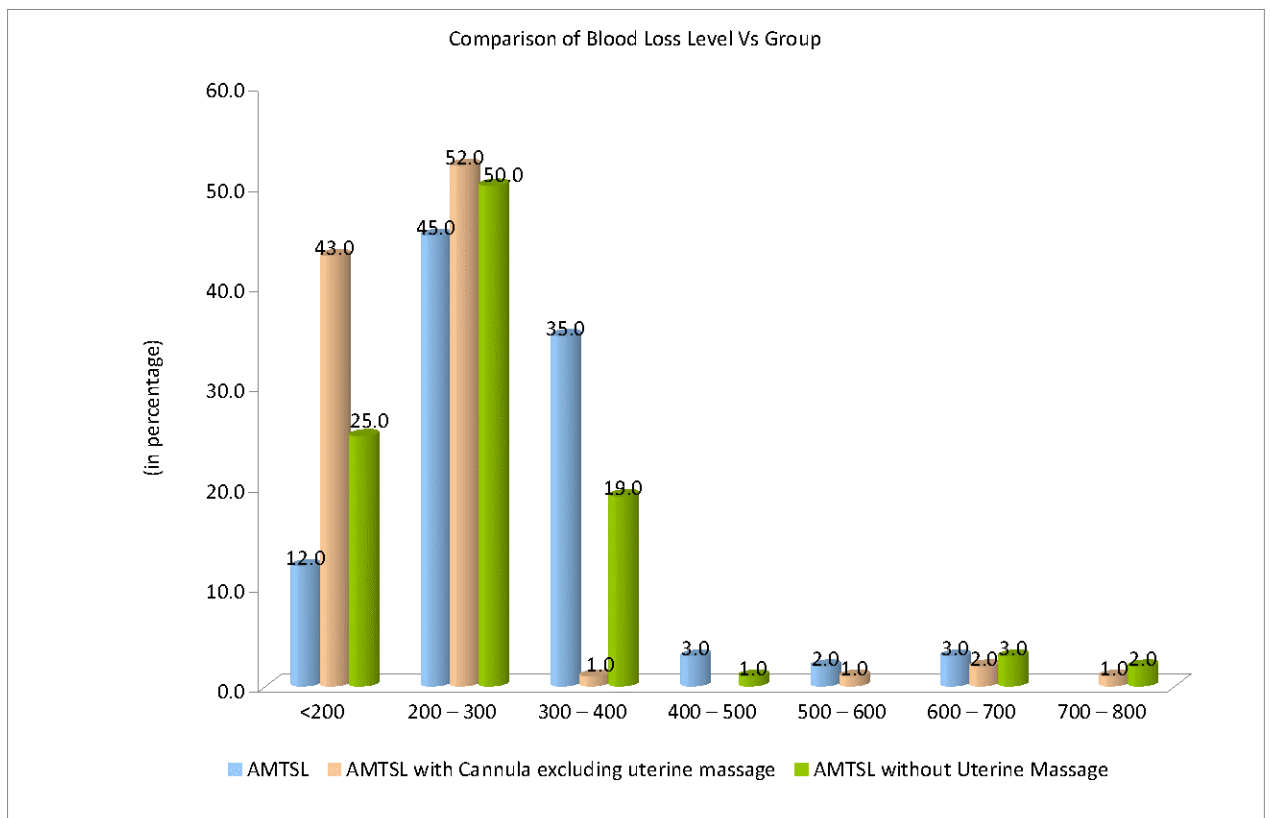
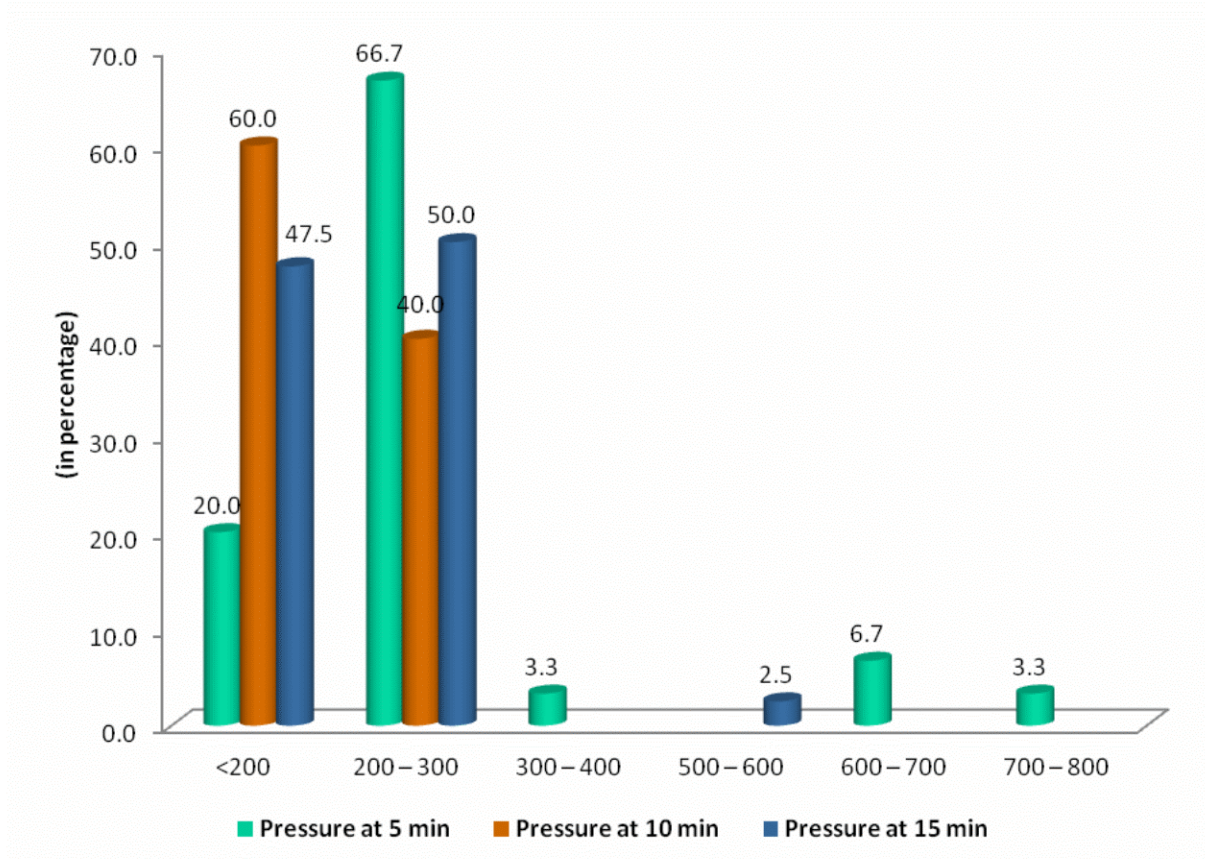


TABLE-XX**COMPARISON OF QUANTITY OF BLOOD LOSS WITHIN SUB-GROUPS****OF AMTSL WITH CANNULA EXCLUDING UTERINE MASSAGE****GROUP**

Blood Loss (in ml)	AMTSL with Cannula		
	Pressure at 5 min	Pressure at 10 min	Pressure at 15 min
	No. (%)	No. (%)	No. (%)
<200	6 (20.0)	18 (60.0)	19 (47.5)
200 – 300	20 (66.7)	12 (40.0)	20 (50.0)
300 – 400	1 (3.3)	-	-
400 – 500	-	-	-
500 – 600	-	-	1 (2.5)
600 – 700	2 (6.7)	-	-
700 – 800	1 (3.3)	-	-
Total	30 (100.0)	30 (100.0)	40 (100.0)
P Value	0.042		

Table-XX shows out of 30 patients who were maintained pressure for 5minutes, about 66.7% were having blood loss of 200-300ml and 20% were having <200ml blood loss. Out of next 30 patients who were kept pressure for 10minutes, 60% had <200ml blood loss and only 40% had blood loss of 200-300ml. In the last 40 patients in whom pressure was maintained for 15 minutes, 50% had 200-300ml blood loss. P value is 0.042 which is statistically significant.

**COMPARISON OF QUANTITY OF BLOOD LOSS WITHIN SUB-GROUPS
OF AMTSL WITH CANNULA EXCLUDING UTERINE MASSAGE GROUP**



DISCUSSION

A labour which is uneventful with normal progress may suddenly become a tragedy when postpartum haemorrhage occurs. There is a proverb "Prevention is better than cure". Hence best way to save lives of women from PPH is by improving the preventive measures. Developing countries like India needs preventive methods that is applicable with the limited resources in low settings. Many studies are conducted to assert the usefulness of non pharmacological methods.

Here this study was conducted in the Department of Obstetrics and Gynaecology, Government Rajaji Hospital, Madurai, to assess the usefulness of vacuum retraction cannula when performed with active management of third stage of labour.

AGE GROUP RANGE COMPARISON:

In this study age group of the patients varied from 19 to 36yrs, maximum number of patients belong to age group 19-25yrs.

My study is comparable to Dr Samartha ram H et al study where they have selected age group range from 19-33 yrs.

In Bela Makhija et al(2014) study the age of patients was between 22 and 36 years.

OBSTETRIC CODE COMPARISON:

In our study, 45% were primigravidae and 55% were multigravidae. Multigravida were more compared to primigravida.

In Bela Makhija et al(2014) study also majority of patients (66.7%) were multipara. Among primi blood loss is low which is statistically significant in cannula group when compared to AMTSL only & AMTSL with out uterine massage group. But in multigravida blood loss is not statistically significant in all three groups.

GESTATIONAL AGE COMPARISON:

Patients of GA <37 weeks were having mean blood loss of 301, 255, 254ml respectively in AMSTL only, AMSTL with cannula excluding uterine massage, AMSTL without uterine massage group with insignificant P value of 0.422. But those with GA \geq 37 weeks were having blood loss of 298, 217, 268ml respectively in AMSTL only, AMSTL with cannula excluding uterine massage, AMSTL without uterine massage group with P value of <0.001 which is statistically significant for cannula group. This is similar to Dr Samartha ram H et al study where blood loss is less in \geq 37 weeks GA than <37 weeks GA when vaccum retraction cannula is used.

BLOOD LOSS COMPARISON:

Blood loss is significantly reduced in AMTSL with cannula excluding uterine massage group. Mean blood loss in routine AMTSL only group is 299.0 ml, in AMTSL with cannula excluding uterine massage group is 223.6 ml, in AMTSL without uterine massage group is 280.8 ml, p value is <0.001 which is statistically significant. There was no severe PPH (>1000ml) in all three groups.

In Samartha ram e al(2014) study there was no significant blood loss of severe grade. In our study, in subgroups of AMTSL with cannula excluding uterine massage group where same pressure maintained at different durations of 5 mins, 10

mins,15 mins, mean blood loss was 273ml if pressure was maintained for 5mins and 194 and 208ml if pressure was maintained for 10 and 15minutes respectively. So it shows that if pressure maintained for 10 mins & more ,its highly effective than maintaining pressure for 5 mins only. P value was 0.003 which is statistically significant.

In samartha ram et al(2014) study bleeding stopped in <4 min of application of cannula. In one more study on PPh by vasudevA panicker (2017) cannula application was done for 30min to stop the hemorrhage involving 55patients.

In one study proposed by **Purwosunu Y et al(2016)¹⁴** using vacuum-induced uterine tamponade, the device remained in place for a minimum of 1 hour. But in our study by maximum of 15 min application of vacuum retraction cannula, we could be able to get good results.

COMPARISON OF QUANTITY RANGE OF BLOOD LOSS BETWEEN GROUPS:

When analyzing the quantity range of blood loss, AMTSL with cannula excluding uterine massage group contributes 43% in < 200 ml when compared to other two groups, thus cannula usage helps in reducing the blood loss and thus can prevent post partum haemorrhage, also >500 ml blood loss is more in AMTSL only group & AMTSL without uterine massage than in AMTSL with cannula excluding uterine massage group, so amount of blood loss even in PPH is less for AMTSL with cannula group. When comparing in subgroups of AMTSL with cannula excluding uterine massage group, quantity range of blood loss is statistically

significant in Pressure maintained for 10 minutes duration, <200 ml blood loss occurred in 60 % of patients.

In Samartha Ram et al(2014) study total amount of blood collected each out of 16 vaginally delivered patients using vacuum retraction cannula was in the range of 100-250ml

ANTENATAL AND POSTPARTUM HEMOGLOBIN COMPARISON:

Antenatal Hb measured ,it was around 9.3 % for all groups and postpartum Hb taken and compared among all groups, it was not statistically significant.

SUMMARY

300 pregnant mothers, delivered by Labour Natural, in Government Rajaji Hospital is taken in this study. In this study, patients are selected randomly, among 300 patients all sorted into three groups, randomly 100 patients are selected for AMTSL alone during third stage of labour, 100 patients are candidates for Cannula insertion during third stage of labour, of these they again subdivided randomly into three subgroups for same pressure maintenance for different durations of 5 mins, 10 mins, 15 mins, 100 patients are selected for AMTSL without uterine massage in third stage of labour.

1. The age range of our study population lies predominantly between 19-25yrs with 64.4%
2. In our study multi gravidae mothers contributed little more(55%) than primigravidae mothers(45%).
3. Pregnant mothers with gestational age ≥ 37 weeks were higher(83.3) than the mothers with preterm gestation(16.7%)
4. After dividing study population equally in to three groups, mothers with age range 19-25yrs contributed more to study in all three groups.
5. On comparing all three groups according to total amount of blood loss, AMTSL with cannula excluding uterine massage group had significantly lower blood loss than other two groups which was statistically significant.
6. According to cannula application time within AMTSL with cannula excluding uterine massage group when compared the total amount of blood

- loss, 10min application time had minimal blood loss which was statistically significant than in patients with 5min application time.
7. According to age range comparison with blood loss, patients with age 19-25yrs and 26 to30yrs had significantly lower blood loss in AMTSL with cannula excluding uterine massage group than others. But in age group 31-36yrs blood loss was not statistically significant for AMTSL with cannula excluding uterine massage group.
 8. By gestational age comparison with total amount of blood loss, patients with $GA \geq 37$ weeks within cannula group had lower blood loss than other groups which was significant in nature. But when comparing the patients with $GA < 37$ weeks of cannula group blood loss was not significant for the group.
 9. Primigravidae patients within AMTSL with cannula excluding uterine massage group had significantly minimal blood loss when compared with primi of other two groups. But multigravidae of all three groups had no statistically significant difference in blood loss in our study.
 10. Difference between antenatal haemoglobin and postpartum haemoglobin was not statistically significant for AMTSL with cannula group. In all three groups there was not significant change in haemoglobin values post delivery.
 11. After quantifying the blood loss amount into different ranges in all three groups, we compared the effectiveness of procedure. Almost all patients with in AMTSL with cannula group had blood loss centered in < 200 ml, 200-

300ml categories when compared to other groups which is statistically significant for cannula group.

12. In patients within AMTSL with cannula excluding uterine massage group, according to cannula application time, 10min cannula application subgroup had cent percent blood loss in the range of <200ml, 200-300ml categories when compared to 5min cannula application subgroup. which was significant statistically.

CONCLUSION

Following third stage of labour, vacuum retraction cannula helps in maintaining the uterine physiology of normal contractile and retractile nature.

This is very handy, ambulatory, ready to use and cost effective device and it takes negligible time to arrange and can stop significant bleeding when applied for 10 and more minutes as shown in this study. During waiting period of 10 minutes episiotomy wound or vaginal laceration can be sutured.

As it decreases the blood loss in 3rd stage of labour, we can prevent life threatening post partum haemorrhage by instituting this simple technique in all settings including low resource setting with sure success.

This vacuum suction cannula is very simple to use and no need of any mastering in handling this device. So we can train people even in primary health centre like nursing midwives and untrained dhais.

As we applied this device only in nontraumatic deliveries, we expect wider applications of this technique in conditions like placenta accreta, and placenta previae with some necessary changes in the future.

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PROFORMA

Name : Age: I.P.No.

Address :

Obstetric history :

LMP: EDD: GA Weeks

Associated high risk factors:

Previous H/o Surgical procedure :

Antepartum Hb% :

Date & Time of delivery :

Duration of labour : 1st stage :

2nd Stage:

Mode of delivery :

Episiotomy :

Perineal lacerations :

Vitals PR: BP: Spo2 :

Baby Details : Term / Pre - term

Birth weight

Apgar :

Placenta delivery time :

Uterine tone :

Cannula application time :

Negative pressure maintained for : 5mins/ 10mins/ 15mins

Vitals PR : BP: Spo2:

Method followed : only AMTSL

AMTSL with retraction cannula excluding uterine
massage

AMTSL without uterine massage

Blood loss measurement:

- (i) Surgical drape
- (ii) In suction apparatus :
- (iii) Two hours postpartum by weighing pad:

Vitals : PR : BP: Spo2:

Post procedure follow up:

- (i) After pains (by visual Analogue Scale (or) Verbal Rating scale)
 - 2 hrs after delivery :
 - 24 hrs after delivery :
- (ii) After 24 hrs : Hb%

S NO	NAME	AGE	IP NO	OBSTETRIC CODE	GA	ANTENATAL HB	AMTSL	AMTSL WITH CANNULA	PRESSURE 5 MINS	PRESSURE 10 MINS	PRESSURE 15 MINS	AMTSL WITHOUT UTERINE MASSAGE	UTERINE TONE	AMOUNT OF BLOOD LOSS	POSTPARTUM HB
1	Ganga devi	25	56360	Primi	39 WEEKS	9.0g	√	-	-	-	-	-	FIRM	250ml	8.9g
2	saranya	24	58296	G2P1L1	38 WEEKS	9.8g	√	-	-	-	-	-	FIRM	200ml	9.6g
3	Soundarya	25	144848	G2P1L1	39 W+5D	9.2g	√	-	-	-	-	-	FIRM	260ml	9.0g
4	Abitha	28	144387	G3P2L2	37W+4D	8.8g	√	-	-	-	-	-	FIRM	260ml	8.8g
5	Saranya devi	25	141878	G2P1L1	39WEEKS	9.4g	√	-	-	-	-	-	FIRM	180ml	9.2g
6	Sathya	29	141936	G3P1L1A1	38 WEEKS	9.0g	√	-	-	-	-	-	FIRM	210ml	9.0g
7	Brinda	29	142632	G2P1L1	36 W+5D	9.2g	√	-	-	-	-	-	FIRM	250ml	9.0g
8	baseera banu	23	142712	Primi	38W+4D	9.6g	√	-	-	-	-	-	FIRM	290ml	9.4g
9	sangeetha	26	142618	Primi	39WEEKS	9.4g	√	-	-	-	-	-	FIRM	310ml	9.2g
10	Nandhini	29	132712	G4P2L2A1	37W+4D	8.6g	√	-	-	-	-	-	FIRM	350ml	8.6g
11	Supraja	22	143212	Primi	36W+5D	9.1g	√	-	-	-	-	-	FIRM	370ml	9.1g
12	Priyanka	27	16231	G2P1L1	38W+4D	9.0g	√	-	-	-	-	-	FIRM	170ml	9.0g
13	velangani	23	2103	Primi	38WEEKS	9.6g	√	-	-	-	-	-	ATONIC	550ml	9.4g
14	Jeyapriya	23	1853	G2P1L1	39W+5D	10g	√	-	-	-	-	-	FIRM	300ml	9.4g
15	Sellammal	27	86591	G3P2L2	38W+3D	8.8g	√	-	-	-	-	-	FIRM	260ml	8.8g
16	Pappathi	20	21512	Primi	37W+3D	10.2g	√	-	-	-	-	-	FIRM	280ml	9.8g
17	Bhuvaneshwari	24	8936	G2P1L1	38W+2D	9.4g	√	-	-	-	-	-	FIRM	340ml	9.4g
18	Vellaiammal	27	9221	G2P1L1	39W+3D	9.6g	√	-	-	-	-	-	FIRM	320ml	9.4g
19	Muthulakshmi	28	29151	G3P1L1A1	36W+5D	9.8g	√	-	-	-	-	-	FIRM	270ml	9.4g
20	Rakeshwari	22	19451	Primi	39WEEKS	9.6g	√	-	-	-	-	-	FIRM	150ml	9.4g
21	Manimegala	23	12256	G2P1L1	38WEEKS	9.8g	√	-	-	-	-	-	FIRM	220ml	9.6g
22	Vellayee	24	13426	Primi	35W+3D	10.3g	√	-	-	-	-	-	FIRM	260ml	9.8g
23	Subbulakshmi	23	12158	G2P1L1	37W+5D	9.3g	√	-	-	-	-	-	FIRM	320ml	9.2g
24	Chitra	28	123161	G3P2L2	38WEEKS	9.0g	√	-	-	-	-	-	FIRM	310ml	9.0g
25	Kanaga	24	12289	G2P1L1	40WEEKS	9.2g	√	-	-	-	-	-	FIRM	280ml	9.0g
26	Vasanthi	22	21341	Primi	40W+1D	9.8g	√	-	-	-	-	-	FIRM	270ml	9.6g
27	Suganya	20	12366	Primi	39WEEKS	8.6g	√	-	-	-	-	-	FIRM	380ml	8.6g

28	Banumathi	24	12342	G2P1L1	39W+4D	9.2g	√	-	-	-	-	-	FIRM	280ml	9.0g
29	Sangeetha	26	101481	G3P2L2	38W+5D	8.6g	√	-	-	-	-	-	FIRM	360ml	8.6g
30	Bhavani	27	10110	G3P1L1A1	37W+6D	9.2g	√	-	-	-	-	-	FIRM	290ml	9.2g
31	Usha rani	27	10732	Primi	40W+5D	9.6g	√	-	-	-	-	-	FIRM	310ml	9.4g
32	Seethalakshmi	28	125331	G3P2L2	38WEEKS	9.8g	√	-	-	-	-	-	FIRM	380ml	9.6g
33	Muthumari	26	12615	G2P1L1	37W+5D	9.8g	√	-	-	-	-	-	FIRM	280ml	9.6g
34	Radhika	27	12654	G2P1L1	39WEEKS	9.4g	√	-	-	-	-	-	FIRM	340ml	9.2g
35	Parameshwari	23	12572	G2P1L1	37W+6D	9.0g	√	-	-	-	-	-	FIRM	260ml	9.0g
36	Anbugeetha	22	12679	Primi	40WEEKS	9.2g	√	-	-	-	-	-	ATONIC	600ml	9.0g
37	Suvitha	20	142632	Primi	40W+4D	9.4g	√	-	-	-	-	-	FIRM	340ml	9.2g
38	Karthiga	22	142614	Primi	38WEEKS	8.8g	√	-	-	-	-	-	FIRM	390ml	8.8g
39	Prasanna	25	56583	G3P1L1A1	37WEEKS	9.8g	√	-	-	-	-	-	FIRM	180ml	9.6g
40	Jeyabharathi	28	141858	G3P2L2	38W+4D	9.8g	√	-	-	-	-	-	FIRM	410ml	9.6g
41	Suganthi	25	141472	Primi	40W+4D	9.0g	√	-	-	-	-	-	FIRM	250ml	9.0g
42	Suganya	25	56196	G2P1L1	39WEEKS	9.4g	√	-	-	-	-	-	FIRM	310ml	9.2g
43	Vijaya	23	56198	G2P1L1	35W+3D	9.6g	√	-	-	-	-	-	FIRM	290ml	9.4g
44	Elizabeth malathy	28	142708	Primi	40W+2D	9.8g	√	-	-	-	-	-	FIRM	310ml	9.6g
45	Petchiammal	24	142017	G2P1L1	38WEEKS	9.8g	√	-	-	-	-	-	FIRM	380ml	9.2g
46	Prema	23	142082	G2P1L1	39W+4D	9.4g	√	-	-	-	-	-	FIRM	250ml	9.0g
47	Banupriya	21	56464	Primi	37W+1D	8.8g	√	-	-	-	-	-	FIRM	450ml	8.2g
48	nagajothi	20	141852	Primi	41WEEKS	9.0g	√	-	-	-	-	-	FIRM	350ml	8.8g
49	Bhuvaneshwari	29	142050	G3P2L2	38W+2D	9.8g	√	-	-	-	-	-	ATONIC	700ml	8.8g
50	Saranya devi	22	142257	G2P1L1	39WEEKS	9.6g	√	-	-	-	-	-	FIRM	360ml	9.2g
51	shanthi	21	142515	Primi	37W+6D	9.4g	√	-	-	-	-	-	FIRM	180ml	9.0g
52	Ramya	26	56566	G3P1L1A1	39W+5D	9.6g	√	-	-	-	-	-	FIRM	210ml	9.0g
53	Karpagam	27	142698	G2P1L1	37W+2D	9.8g	√	-	-	-	-	-	FIRM	280ml	9.0g
54	Veerammal	28	57129	G2P1L1	36WEEKS	9g	√	-	-	-	-	-	FIRM	350ml	8.8g
55	Bharakath nisha	21	142745	Primi	39 WEEKS	10.0g	√	-	-	-	-	-	FIRM	160ml	9.4g
56	Annappillai	23	141974	Primi	38 WEEKS	9.2g	√	-	-	-	-	-	FIRM	260ml	9.0g
57	Amutha	27	142842	G2P1L1	39 W+5D	9.4g	√	-	-	-	-	-	FIRM	370ml	9.0g
58	malarkodi	23	142785	G2P1L1	37W+4D	9.6g	√	-	-	-	-	-	FIRM	210ml	9.2g
59	premalatha	28	142964	G3P2L2	39WEEKS	9.8g	√	-	-	-	-	-	FIRM	360ml	9.0g
60	Chitra	22	143000	Primi	38 WEEKS	9.4g	√	-	-	-	-	-	FIRM	380ml	9.2g

61	Krishnaveni	22	15812	Primi	36 W+5D	9.8g	√	-	-	-	-	-	FIRM	320ml	9.2g
62	Amna devi	21	17957	Primi	35W+3D	9.4g	√	-	-	-	-	-	FIRM	410ml	9.0g
63	Alagujothi	22	15934	G2P1L1	36W+5D	9.0g	√	-	-	-	-	-	FIRM	350ml	8.4g
64	Keertiga	32	15869	G3P2L2	40W+3D	9.4g	√	-	-	-	-	-	FIRM	290ml	9.0g
65	Bharakath nisha	26	15906	G2P1L1	37W+4D	9.6g	√	-	-	-	-	-	FIRM	310ml	9.4g
66	Dhanalakshmi	35	15920	G4P2L2A1	38WEEKS	9.4g	√	-	-	-	-	-	FIRM	170ml	9.2g
67	Ragaya banu	19	15910	Primi	37W+3D	9.8g	√	-	-	-	-	-	ATONIC	650ml	9.6g
68	Sundareswari	23	15935	G2P1L1	38WEEKS	10.0g	√	-	-	-	-	-	FIRM	340ml	9.8g
69	Yamuna	19	15929	Primi	38W+5D	9.4g	√	-	-	-	-	-	FIRM	210ml	9.2g
70	kavitha	22	15883	G2P1L1	39 WEEKS	9.6g	√	-	-	-	-	-	FIRM	200ml	9.4g
71	Nagalakshmi	21	15826	G2P1L1	39WEEKS	9.4g	√	-	-	-	-	-	FIRM	230ml	9.4g
72	Murugeswari	28	15941	G3P1L1A1	38 WEEKS	9.8g	√	-	-	-	-	-	FIRM	330ml	9.6g
73	Abinaya	21	15946	Primi	36 W+5D	9.4g	√	-	-	-	-	-	FIRM	350ml	9.2g
74	Nithya	27	15810	G2P1L1	35W+3D	9.9g	√	-	-	-	-	-	FIRM	280ml	9.2g
75	Rajeshwari	24	15766	G2P1L1	36W+5D	10.0g	√	-	-	-	-	-	FIRM	340ml	9.4g
76	Muthupetchi	25	15874	G2P1L1	40W+3D	9.6g	√	-	-	-	-	-	FIRM	270ml	9.2g
77	Jeyaprema	26	15850	G3P1L1A1	37W+4D	9.8g	√	-	-	-	-	-	FIRM	180ml	9.4g
78	Anusya	19	68073	Primi	38WEEKS	9.4g	√	-	-	-	-	-	FIRM	220ml	9.0g
79	Shanmugavalli	25	15944	G2P1L1	37W+3D	9.8g	√	-	-	-	-	-	FIRM	290ml	9.4g
80	Ramalakshmi	27	15982	G3P1L1A1	38WEEKS	9.4g	√	-	-	-	-	-	FIRM	380ml	9.2g
81	malathi	20	68119	Primi	38W+5D	9.0g	√	-	-	-	-	-	FIRM	320ml	8.8g
82	Murugalakshmi	27	1142460	G2P1L1	35W+1D	8.8g	√	-	-	-	-	-	FIRM	360ml	8.8g
83	Karpagam	21	143158	G2P1L1	37W+2D	9.2g	√	-	-	-	-	-	ATONIC	680ml	9.0g
84	Sarojini	20	55637	Primi	38WEEKS	9.4g	√	-	-	-	-	-	FIRM	290ml	9.2g
85	Gayathri	23	143592	G2P1L1	39 WEEKS	9.6g	√	-	-	-	-	-	FIRM	310ml	9.4g
86	Malathy	29	355908	G3P2L2	38 WEEKS	9.8g	√	-	-	-	-	-	FIRM	190ml	9.6g
87	Chandralekha	20	143581	Primi	39 W+5D	9.2g	√	-	-	-	-	-	FIRM	260ml	9.0g
88	Shanthi	26	1145388	G2P1L1	37W+4D	9.6g	√	-	-	-	-	-	FIRM	240ml	9.4g
89	Suryadevi	27	143776	G2P1L1	39WEEKS	9.8g	√	-	-	-	-	-	FIRM	180ml	9.2g
90	Rani	30	145169	G3P1L1A1	38 WEEKS	9.2g	√	-	-	-	-	-	FIRM	210ml	9.0g
91	pandialakshmi	22	143871	Primi	36 W+5D	8.8g	√	-	-	-	-	-	FIRM	290ml	8.8g
92	Meera	20	55956	Primi	35W+3D	9.0g	√	-	-	-	-	-	FIRM	200ml	9g
93	Surath nisha	25	143946	G2P1L1	36W+5D	9.8g	√	-	-	-	-	-	FIRM	250ml	9.4g
94	Muthulakshmi	20	56759	Primi	40W+3D	9.6g	√	-	-	-	-	-	FIRM	170ml	9.2g

95	Gurubackiyam	29	56612	G2P1L1	37W+4D	8.8g	√	-	-	-	-	-	FIRM	240ml	8.8g
96	Rakku	27	143498	G3P1L1A1	38WEEKS	9.8g	√	-	-	-	-	-	FIRM	210ml	9.4g
97	Thangammal	26	144315	G2P1L1	37W+3D	9.6g	√	-	-	-	-	-	FIRM	230ml	9.4g
98	Manimegalai	19	144333	Primi	38WEEKS	9.8g	√	-	-	-	-	-	FIRM	170ml	9.4g
99	Vasunthra devi	21	1148364	Primi	38W+5D	9.4g	√	-	-	-	-	-	FIRM	230ml	9.2g
100	meenatchi	24	144430	G2P1L1	39 WEEKS	10.0g	√	-	-	-	-	-	FIRM	310ml	9.8g
101	Rajeshwari	27	146459	G3P1L1A1	38W+5D	8.8g	-	√	√	-	-	-	FIRM	260ml	8.6g
102	Karthiga	21	143408	G2P1L1	37WEEKS	9.0g	-	√	√	-	-	-	FIRM	250ml	9.0g
103	Shanmugapriya	23	144466	G2P1L1	35WEEKS	9.2g	-	√	√	-	-	-	ATONIC	650ml	9.0g
104	shanthi	24	56942	G2P1L1	38WEEKS	9.4g	-	√	√	-	-	-	FIRM	300ml	9.2g
105	Pandiyammal	22	144855	G2P1L1	37W+3D	9.6g	-	√	√	-	-	-	FIRM	320ml	9.4g
106	Lakshmi	20	58415	Primi	36W+2D	8.8g	-	√	√	-	-	-	FIRM	170ml	9.0g
107	Devisaravanan	23	144937	Primi	40W+2D	9.4g	-	√	√	-	-	-	FIRM	200ml	9.2g
108	meenatchi	26	145098	G3P1L1A1	34WEEK	9.6g	-	√	√	-	-	-	FIRM	250ml	9.4g
109	Dhivya	21	58850	Primi	39W+5D	9.8g	-	√	√	-	-	-	FIRM	200ml	9.4g
110	Revathi	25	145186	G2P1L1	37W+5D	9.4g	-	√	√	-	-	-	FIRM	180ml	9.4g
111	Prema	20	144662	Primi	38W+4D	10.0g	-	√	√	-	-	-	FIRM	200ml	9.6g
112	Valarmathy	23	145394	Primi	36W+4D	9.0g	-	√	√	-	-	-	FIRM	210ml	9.0g
113	Krishnaveni	34	145602	G3P2L2	38W+4D	8.8g	-	√	√	-	-	-	ATONIC	780ml	8.2g
114	Logeshwari	20	146475	Primi	39W+5D	9.6g	-	√	√	-	-	-	FIRM	210ml	9.4g
115	Muthulakshmi	23	145298	Primi	41WEEKS	9.4g	-	√	√	-	-	-	FIRM	220ml	9.2g
116	Sneha	23	146474	G3P1L1A1	39W+2D	9.8g	-	√	√	-	-	-	FIRM	190ml	9.4g
117	Jeyalakshmi	22	111480	Primi	40W+4D	9.0g	-	√	√	-	-	-	FIRM	220ml	9.0g
118	pandiammal	23	145767	G2P1L1	37W+4D	9.2g	-	√	√	-	-	-	FIRM	240ml	8.6g
119	Veeralakshmi	27	147320	G3P2L2	39W+4D	9.4g	-	√	√	-	-	-	FIRM	250ml	9.2g
120	Mansura begam	21	148235	Primi	37W+2D	9.6g	-	√	√	-	-	-	FIRM	190ml	9.4g
121	Anandham	30	143845	G2P1L1	40W+3D	9.8g	-	√	√	-	-	-	FIRM	230ml	9.4g
122	Ayyammal	25	149279	G3A2	37W+4D	10g	-	√	√	-	-	-	FIRM	250ml	9.6g
123	Chitra devi	22	149324	Primi	38WEEKS	9.6g	-	√	√	-	-	-	ATONIC	680ml	9.4g
124	Megala	21	141341	Primi	37W+3D	9.4g	-	√	√	-	-	-	FIRM	180ml	9.2g
125	Singaperumayee	31	151241	Primi	39WEEKS	9.6g	-	√	√	-	-	-	FIRM	250ml	9.4g
126	Sathya	22	152248	Primi	38 WEEKS	9.6g	-	√	√	-	-	-	FIRM	250ml	9.4g
127	Sangeetha	21	15381	Primi	36 W+5D	9.4g	-	√	√	-	-	-	FIRM	230ml	9.2g
128	Sasirekha	19	16421	Primi	38W+4D	9.4g	-	√	√	-	-	-	FIRM	210ml	9.2g

129	Vaishnavi	25	141702	Primi	39WEEKS	9.2g	-	√	√	-	-	-	FIRM	240ml	9.0g
130	maharani	22	141750	Primi	37W+4D	8.6g	-	√	√	-	-	-	FIRM	190ml	8.4g
131	Anjali	28	141782	Primi	36W+5D	9.0g	-	√	√	√	√	√	FIRM	200ml	9.0g
132	Vanamayil	29	141842	G4P1L1A2	38W+4D	9.2g	-	√	√	√	√	√	FIRM	180ml	9.0g
133	Vasanthi	33	141898	Primi	38WEEKS	8.8g	-	√	-	√	-	-	FIRM	150ml	8.8g
134	Bhuvaneshwari	25	141912	Primi	39W+5D	9.4g	-	√	-	√	-	-	FIRM	180ml	9.2g
135	Muthukali	23	1137927	Primi	38W+3D	9.6g	-	√	-	√	-	-	FIRM	190ml	9.4g
136	Panchavarnam	26	1138121	Primi	38W+4D	9.8g	√	√	-	√	-	-	FIRM	210ml	9.6g
137	pavithra	21	141921	Primi	38WEEKS	9.2g	√	√	-	√	-	-	FIRM	180ml	9.0g
138	Vasanthi	23	1139121	Primi	39W+5D	8.8g	√	√	-	√	-	-	FIRM	210ml	8.8g
139	Suganya	21	1431281	Primi	38W+3D	9.8g	√	√	-	√	-	-	FIRM	250ml	9.6g
140	Ariyanatchi	24	1451731	Primi	37W+3D	9.2g	√	√	-	√	-	-	FIRM	170ml	9.0g
141	Poongodi	29	1461012	G2P1L1	38W+2D	9.8g	-	√	-	√	-	-	FIRM	180ml	9.6g
142	Jothi	22	1481231	Primi	39W+3D	9.2g	-	√	-	√	-	-	FIRM	220ml	9.0g
143	Maheshwari	35	149231	G4P2L2A1	36W+5D	8.8g	-	√	-	√	-	-	FIRM	250ml	8.8g
144	Subathra	28	149481	Primi	39WEEKS	9.4g	-	√	-	√	-	-	FIRM	150ml	9.2g
145	Muniyammal	34	156212	Primi	38WEEKS	9.6g	-	√	-	√	-	-	FIRM	180ml	9.4g
146	Chellammal	35	158231	G3P2L0	35W+3D	9.4g	-	√	-	√	-	-	FIRM	160ml	9.2g
147	Ramya	23	158290	G2P1L1	37W+5D	9.0g	-	√	-	√	-	-	FIRM	190ml	9.0g
148	Sathya	25	159131	G2P1L1	38WEEKS	9.8g	-	√	√	√	√	√	FIRM	210ml	9.6g
149	Chitra	23	153712	G4P2L2A1	40WEEKS	9.2g	-	√	√	√	√	√	FIRM	230ml	9.0g
150	Shanthi	22	163812	Primi	39WEEKS	9.4g	-	√	√	√	√	√	FIRM	180ml	9.2g
151	Soundarya	24	174213	G2P1L1	39W+4D	9.2g	-	√	√	√	√	√	FIRM	200ml	9.0g
152	Siva priyanka	24	175124	Primi	38W+5D	9.4g	-	√	√	√	√	√	FIRM	190ml	9.2g
153	mahalakshmi	21	182314	Primi	37W+6D	9.2g	-	√	-	√	-	-	FIRM	250ml	9.0g
154	muthumari	23	134234	Primi	40W+5D	9.1g	-	√	-	√	-	-	FIRM	190ml	9.0g
155	Shanthi	24	134821	G2P1L1	38WEEKS	9.3g	-	√	-	√	-	-	FIRM	210ml	9.0g
156	Lakshmi prabha	21	162121	Primi	37W+5D	9.4g	√	√	-	√	-	-	FIRM	180ml	9.2g
157	Shenbagapriya	26	17531	Primi	39 WEEKS	9.6g	√	√	-	√	-	-	FIRM	230ml	9.4g
158	pasilaparveen	24	14831	G3P2L2	38 WEEKS	9.4g	√	√	-	√	-	-	FIRM	180ml	9.2g
159	Pandiammal	32	131427	Primi	39 W+5D	9.2g	√	√	-	√	-	-	FIRM	150ml	9.0g
160	Shobana	21	151261	Primi	37W+4D	9.4g	√	√	-	√	-	-	FIRM	170ml	9.2g
161	kanivalli	22	133421	Primi	39 WEEKS	9.5g	-	√	-	-	√	-	FIRM	160ml	9.2g
162	Vijaya	23	143811	Primi	38 WEEKS	9.6g	-	√	-	-	√	-	FIRM	210ml	9.4g

163	Thaneeswari	24	15241	G3P2L2	39 W+5D	9.3g	-	√	-	-	√	-	FIRM	250ml	9.0g
164	Thavittammal	20	142101	Primi	37W+4D	9.2g	-	√	-	-	√	-	FIRM	210ml	9.0g
165	Dhivya bharathi	23	141600	Primi	39WEEKS	9.6g	-	√	-	-	√	-	FIRM	180ml	9.4g
166	Nagajothi	22	141852	G2P1L1	38 WEEKS	9.8g	-	√	-	-	√	-	FIRM	150ml	9.4g
167	Dhivya	22	131867	Primi	36 W+5D	9.9g	-	√	-	-	√	-	FIRM	160ml	9.8g
168	Suganthi	34	142913	Primi	38W+4D	9.4g	-	√	-	-	√	-	FIRM	170ml	9.2g
169	Kaleeswari	20	12314	Primi	39WEEKS	9.6g	-	√	-	-	√	-	FIRM	190ml	9.4g
170	Sankari	22	16314	Primi	37W+4D	9.2g	-	√	-	-	√	-	FIRM	210ml	9.0g
171	Mariammal	23	14312	Primi	36W+5D	9.4g	-	√	-	-	√	-	FIRM	230ml	9.2g
172	Radhika	24	152142	Primi	38W+4D	9.6g	-	√	-	-	√	-	FIRM	210ml	9.4g
173	Sangeetha priya	21	14341	Primi	38WEEKS	9.1g	-	√	-	-	√	-	FIRM	190ml	9.0g
174	Muthulakshmi	27	143012	G3P2L2	39W+5D	9.2g	-	√	-	-	√	-	FIRM	180ml	8.8g
175	Ishwarya	23	141012	Primi	38W+3D	9.4g	-	√	-	-	√	-	FIRM	150ml	9.3g
176	Ramu	22	142938	Primi	37W+3D	9.2g	-	√	-	-	√	-	FIRM	180ml	9.1g
177	Megala	21	152184	Primi	38W+2D	9.1g	-	√	-	-	√	-	FIRM	200ml	8.8g
178	Rajalakshmi	31	143130	G3P2L2	39W+3D	9.3g	-	√	-	-	√	-	FIRM	220ml	9.0g
179	Aathammal	25	143162	Primi	36W+5D	9.1g	-	√	-	-	√	-	FIRM	210ml	8.8g
180	Sindhuja	22	154238	Primi	39WEEKS	9.2g	-	√	-	-	√	-	FIRM	190ml	9.0g
181	kalpanadevi	22	15621	Primi	37W+3D	8.8g	-	√	-	-	√	-	FIRM	210ml	8.8g
182	Murugeswari	28	114841	G3P2L2	38WEEKS	9.0g	-	√	-	-	√	-	FIRM	220ml	9.0g
183	Shanthi	23	1138121	Primi	38W+5D	9.8g	-	√	-	-	√	-	FIRM	250ml	9.4g
184	Muthuammal	24	134121	Primi	35W+1D	9.1g	-	√	-	-	√	-	FIRM	170ml	9.0g
185	Muthuselvi	25	121644	G2A1	37W+2D	9.0g	-	√	-	-	√	-	FIRM	190ml	9.0g
186	Jeyapriya	23	114555	G2P1L1	38WEEKS	9.2g	-	√	-	-	√	-	FIRM	210ml	8.8g
187	Jeniferrani	27	118431	G2P1L1	39 WEEKS	9.1g	-	√	-	-	√	-	FIRM	220ml	9.0g
188	Lakshmi priya	33	134126	Primi	38 WEEKS	9.4g	-	√	-	-	√	-	FIRM	190ml	9.2g
189	Vaitheeswari	22	152141	G2P1L1	39 W+5D	9.8g	-	√	-	-	√	-	FIRM	230ml	9.2g
190	Roopika	19	153141	Primi	37W+4D	8.6g	-	√	-	-	√	-	FIRM	210ml	8.6g
191	Sebastin joy jesim	26	162131	Primi	39WEEKS	9.0g	-	√	-	-	√	-	FIRM	250ml	8.8g
192	menaka	23	143141	Primi	38 WEEKS	9.2g	-	√	-	-	√	-	FIRM	190ml	9.0g
193	Kanimozhi	26	1146469	Primi	36 W+5D	9.4g	-	√	-	-	√	-	FIRM	160ml	9.2g
194	Pushphalatha	27	145812	Primi	35W+3D	9.6g	-	√	-	-	√	-	FIRM	180ml	9.4g
195	Saraswathi	22	144610	G2A1	36W+5D	9.8g	-	√	-	-	√	-	ATONIC	600ml	8.2g

196	Soundarya	20	144793	Primi	40W+3D	9.4g	-	√	-	-	√	-	FIRM	190ml	9.2g
197	banu	35	154812	G5P1A4	37W+4D	9.3g	-	√	-	-	√	-	FIRM	180ml	9.0g
198	Gomathi	26	131214	G2P1L1	38WEEKS	9.6g	-	√	-	-	√	-	FIRM	210ml	9.0g
199	Angaleswari	24	16134	G2P1L1	37W+3D	9.2g	-	√	-	-	√	-	FIRM	200ml	9.0g
200	Karthiga	20	16244	Primi	38WEEKS	9.8g	-	√	-	-	√	-	FIRM	230ml	9.6g
201	Bhuvaneshwari	19	17134	Primi	38W+5D	9.2g	-	-	-	-	-	√	FIRM	190ml	9.0g
202	Kanagalakshmi	26	18214	G5P2L2A2	37W+2D	9.4g	-	-	-	-	-	√	FIRM	180ml	9.2g
203	Murugeswari	32	154807	G3P2L2	40W+3D	9.3g	-	-	-	-	-	√	FIRM	190ml	9.2g
204	Muneeswari	25	154329	G2P1L1	37W+4D	9.5g	-	-	-	-	-	√	FIRM	210ml	9.1g
205	Kokila	26	10890	G2P1L1	38WEEKS	9.6g	-	-	-	-	-	√	FIRM	220ml	9.4g
206	Dhanalakshmi	20	49937	G2P1L1	37W+3D	9.4g	-	-	-	-	-	√	FIRM	180ml	9.2g
207	Selvi	28	10924	G4P3L3	39WEEKS	9.2g	-	-	-	-	-	√	ATONIC	700ml	9.0g
208	Pappammal	36	10724	G3P2L2	38 WEEKS	9.4g	-	-	-	-	-	√	FIRM	250ml	9.2g
209	Suganyadevi	23	50250	G2P1L1	36 W+5D	8.8g	-	-	-	-	-	√	FIRM	290ml	8.8g
210	Alagumuthu	26	156388	G2P1L1	38W+4D	9.7g	-	-	-	-	-	√	FIRM	310ml	9.4g
211	Dhavaselvi	26	22601	G4P3L1	39WEEKS	9.2g	-	-	-	-	-	√	FIRM	350ml	9.0g
212	Gayathri	25	160281	G3P2L2	37W+4D	9.8g	-	-	-	-	-	√	FIRM	370ml	9.4g
213	Pushpam	35	154993	G4P3L2	36W+5D	9.3g	-	-	-	-	-	√	ATONIC	670ml	9.0g
214	Mythili	24	161715	G3P2L1	38W+4D	9.1g	-	-	-	-	-	√	FIRM	200ml	8.8g
215	Viji	22	1131590	G2P1L1	38WEEKS	9.4g	-	-	-	-	-	√	FIRM	300ml	9.2g
216	Saranya	25	151706	G2P1L1	39W+5D	9.6g	-	-	-	-	-	√	FIRM	260ml	9.4g
217	karpagavalli	24	11897	G2P1L1	38W+3D	9.1g	-	-	-	-	-	√	FIRM	280ml	8.8g
218	Parameshwari	29	12081	G2P1L1	38W+4D	9.7g	-	-	-	-	-	√	FIRM	340ml	9.3g
219	Thangam	27	11664	G2P1L1	38WEEKS	9.2g	-	-	-	-	-	√	FIRM	200ml	9.0g
220	Nishanthini	25	12941	Primi	39W+5D	9.8g	-	-	-	-	-	√	FIRM	360ml	9.4g
221	Ramuthai	24	13427	Primi	38W+3D	9.1g	-	-	-	-	-	√	FIRM	180ml	9.0g
222	Revathy	24	17342	G2P1L1	36WEEKS	9.3g	-	-	-	-	-	√	FIRM	210ml	9.2g
223	Divya	22	10435	G2P1L1	39 WEEKS	9.2g	-	-	-	-	-	√	FIRM	280ml	9.0g
224	Aruvi	27	17632	G3P2L1	38 WEEKS	9.4g	-	-	-	-	-	√	FIRM	350ml	9.2g
225	Thenmozhi	23	10942	Primi	39 W+5D	9.5g	-	-	-	-	-	√	FIRM	160ml	9.2g
226	Ammaponnu	21	15428	Primi	37W+4D	9.2g	-	-	-	-	-	√	FIRM	260ml	9.0g
227	Kalpana	23	12452	Primi	39WEEKS	9.4g	-	-	-	-	-	√	FIRM	370ml	9.2g
228	Surya	21	12332	Primi	38 WEEKS	9.7g	-	-	-	-	-	√	FIRM	210ml	9.3g
229	Lakshmi	31	6352	G2P1L1	36 W+5D	9.2g	-	-	-	-	-	√	FIRM	360ml	9.0g

230	Devi	25	114075	Primi	35W+3D	9.2g	-	-	-	-	-	√	FIRM	380ml	9.0g
231	Rajeshwari	35	3537	G3P2L1	36W+5D	9.3g	-	-	-	-	-	√	FIRM	320ml	9.1g
232	Muthulakshmi	29	6535	G2P1L1	40W+3D	9.4g	-	-	-	-	-	√	FIRM	410ml	9.2g
233	Suganya	25	5811	Primi	37W+4D	9.6g	-	-	-	-	-	√	FIRM	350ml	9.2g
234	Umamaheshwari	26	52513	G2P1L1	38WEEKS	8.8g	-	-	-	-	-	√	FIRM	290ml	8.8g
235	Inbavalli	27	52750	G2P1L1	37W+3D	9.4g	-	-	-	-	-	√	FIRM	310ml	9.3g
236	Vijayalakshmi	35	52682	G3P1L1A1	38WEEKS	9.1g	-	-	-	-	-	√	FIRM	170ml	9.0g
237	Selvi	30	52974	G2P1L1	38W+5D	9.3g	-	-	-	-	-	√	FIRM	210ml	9.2g
238	Sasirekha	32	53053	G3P1L1A1	39 WEEKS	9.1g	-	-	-	-	-	√	FIRM	340ml	8.8g
239	Gowri	29	34120	G2P1L1	39WEEKS	8.8g	-	-	-	-	-	√	FIRM	210ml	8.8g
240	Sivashankari	28	13265	G5P2L2A2	38 WEEKS	9.2g	-	-	-	-	-	√	FIRM	280ml	9.0g
241	Sivagami	25	14325	G3A2	36 W+5D	9.4g	-	-	-	-	-	√	FIRM	170ml	9.2g
242	Bharathi	25	53218	Primi	35W+3D	9.2g	-	-	-	-	-	√	FIRM	180ml	9.1g
243	Avadaiammal	23	64923	G3P2L1	38WEEKS	9.3g	-	-	-	-	-	√	FIRM	220ml	9.1g
244	Thaiammal	28	14732	Primi	37W+3D	9.2g	-	-	-	-	-	√	FIRM	250ml	9.0g
245	Rubini	24	32745	Primi	36W+2D	9.1g	-	-	-	-	-	√	FIRM	150ml	9.0g
246	Isakiyammal	23	14832	Primi	40W+2D	9.3g	-	-	-	-	-	√	FIRM	180ml	9.1g
247	Preethi	21	15329	G3P1L1A1	34WEEK	9.1g	-	-	-	-	-	√	FIRM	160ml	9.0g
248	Prabha	20	14272	G3P2L2	39W+5D	9.6g	-	-	-	-	-	√	FIRM	190ml	9.2g
249	Harini	29	13632	Primi	37W+5D	9.4g	-	-	-	-	-	√	FIRM	210ml	9.2g
250	Fathima	22	53132	G2P1L1	38W+4D	9.3g	-	-	-	-	-	√	FIRM	230ml	9.0g
251	Sudha	21	15341	G2P1L1	36W+4D	9.0g	-	-	-	-	-	√	FIRM	180ml	8.8g
252	Jayalakshmi	26	15623	Primi	38W+4D	9.2g	-	-	-	-	-	√	FIRM	200ml	9.0g
253	Sivaprabha	27	54743	G2P1L1	39W+5D	9.1g	-	-	-	-	-	√	FIRM	190ml	9.0g
254	Vanitha	28	21543	G2P1L1	41WEEKS	9.2g	-	-	-	-	-	√	FIRM	250ml	9.1g
255	Geetha	21	63252	Primi	39W+2D	9.1g	-	-	-	-	-	√	FIRM	190ml	9.0g
256	Sivapriya	23	14321	Primi	40W+4D	8.8g	-	-	-	-	-	√	FIRM	210ml	9.0g
257	Rathi	27	14209	G3P2L1	37W+4D	9.2g	-	-	-	-	-	√	FIRM	180ml	9.1g
258	Sindhuja	23	25093	Primi	39W+4D	9.4g	-	-	-	-	-	√	FIRM	230ml	9.2g
259	Tanusha	22	14932	Primi	37W+2D	9.6g	-	-	-	-	-	√	FIRM	180ml	9.4g
260	Devi	23	15038	G2P1L1	40W+3D	9.3g	-	-	-	-	-	√	FIRM	150ml	9.3g
261	Parvathi	24	13026	G2P1L1	37W+4D	9.8g	-	-	-	-	-	√	FIRM	320ml	9.4g
262	Vidhya	21	14046	Primi	38WEEKS	9.3g	-	-	-	-	-	√	FIRM	210ml	9.1g
263	Sripriya	27	14092	G3P2L2	37W+3D	9.2g	-	-	-	-	-	√	FIRM	310ml	9.0g

264	Muniammal	23	15402	G2P1L1	38W+5D	9.6g	-	-	-	-	-	√	FIRM	260ml	9.4g
265	Muthuakkal	22	13092	Primi	37W+6D	9.2g	-	-	-	-	-	√	FIRM	250ml	9.0g
266	Bhavani	21	15470	Primi	40W+5D	9.8g	-	-	-	-	-	√	FIRM	650ml	9.2g
267	Rakkammal	31	26150	G3P2L2	38WEEKS	10.0g	-	-	-	-	-	√	FIRM	300ml	9.6g
268	Sugantha	25	16390	G3P1L1A1	37W+5D	9.3g	-	-	-	-	-	√	FIRM	320ml	9.0g
269	Durgadevi	22	14630	G2P1L1	39WEEKS	9.1g	-	-	-	-	-	√	FIRM	170ml	8.8g
270	Vijaya	22	14790	Primi	37W+6D	9.4g	-	-	-	-	-	√	FIRM	200ml	9.2g
271	Parameshwari	28	14092	G3P2L2	40WEEKS	9.6g	-	-	-	-	-	√	ATONIC	250ml	9.2g
272	Radhamani	23	13852	Primi	40W+4D	9.5g	-	-	-	-	-	√	FIRM	200ml	9.4g
273	Alamelu	24	17209	G3P1L1A1	38WEEKS	9.1g	-	-	-	-	-	√	FIRM	180ml	9.0g
274	Ramya	25	11427	G2P1L1	37WEEKS	9.4g	-	-	-	-	-	√	FIRM	200ml	9.0g
275	Poornima	23	27149	G3A2	38W+4D	9.1g	-	-	-	-	-	√	FIRM	210ml	9.0g
276	Sivajothi	27	37190	G2P1L1	40W+4D	9.3g	-	-	-	-	-	√	FIRM	780ml	9.2g
277	Visalatchi	33	12745	G2P1L1	39WEEKS	9.4g	-	-	-	-	-	√	FIRM	210ml	9.2g
278	Nirmaladevi	22	16290	Primi	35W+3D	9.6g	-	-	-	-	-	√	FIRM	220ml	9.4g
279	Poorvika	19	17349	Primi	40W+2D	9.2g	-	-	-	-	-	√	FIRM	190ml	9.0g
280	Poornima devi	19	48210	Primi	38WEEKS	9.8g	-	-	-	-	-	√	FIRM	220ml	9.4g
281	Afrin banu	22	13729	Primi	39W+4D	9.1g	-	-	-	-	-	√	FIRM	240ml	9.0g
282	Kani	21	14729	G2A1	37W+1D	9.3g	-	-	-	-	-	√	FIRM	250ml	9.1g
283	Suryakala	28	27130	G3P1L1A1	41WEEKS	9.1g	-	-	-	-	-	√	FIRM	230ml	9.0g
284	Sangeetha priya	21	15279	Primi	38WEEKS	9.8g	-	-	-	-	-	√	FIRM	210ml	9.2g
285	Vijayalakshmi	27	13860	G2P1L1	37+4D	9.3g	-	-	-	-	-	√	FIRM	320ml	9.1g
286	Muthumeena	24	14390	G3P1L1A1	37WEEKS	9.1g	-	-	-	-	-	√	FIRM	230ml	9.0g
287	Priyadharshini	25	32780	G2P1L1	37+6D	9.4g	-	-	-	-	-	√	FIRM	310ml	9.2g
288	Susan	26	18225	G2P1L1	38+1D	9.1g	-	-	-	-	-	√	FIRM	290ml	9.0g
289	Mary ammal	19	16209	Primi	39WEEKS	9.8g	-	-	-	-	-	√	ATONIC	740ml	9.4g
290	Dhanam	25	13283	G2P1L1	38W+5D	9.4g	-	-	-	-	-	√	FIRM	290ml	9.2g
291	Monica	27	11673	G2P1L1	39 WEEKS	9.1g	-	-	-	-	-	√	FIRM	210ml	9.0g
292	Rani	20	42109	Primi	39WEEKS	9.4g	-	-	-	-	-	√	FIRM	220ml	9.2g
293	Chinnathai	27	14390	G3P1L1A1	38 WEEKS	9.2g	-	-	-	-	-	√	FIRM	190ml	9.0g
294	Vasanthammal	21	12098	Primi	36 W+5D	9.5g	-	-	-	-	-	√	FIRM	220ml	9.2g
295	Radhika	20	14908	Primi	35W+3D	9.7g	-	-	-	-	-	√	FIRM	170ml	9.4 g
296	Parvathiammal	23	21309	Primi	36W+5D	9.8g	-	-	-	-	-	√	FIRM	210ml	9.4g
297	Suryalakshmi	29	15888	G4A3	40W+3D	9.6g	-	-	-	-	-	√	FIRM	340ml	9.2g

298	Prabhavathi	20	15832	Primi	37W+4D	9.3g	-	-	-	-	-	√	FIRM	210ml	9.1g
299	Karthiga devi	26	16382	G2P1L1	38WEEKS	8.8g	-	-	-	-	-	√	FIRM	280ml	8.8g
300	Pandeeswari	27	21743	G3P2L2	37W+3D	9.3g	-	-	-	-	-	√	FIRM	170ml	9.2g



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**ETHICS COMMITTEE
 CERTIFICATE**

Name of the Candidate : **Dr.M.Vijayalakshmi**

Course : **PG in MS., Obstetrics &
 Gynaecology**

Period of Study : **2016 - 2018**

College : **MADURAI MEDICAL COLLEGE**

Research Topic : **Study on assessment of Blood
 Loss in third stage of Labour
 using vacuum Retraction
 cannula.**

Ethical Committee as on : **11.09.2017**

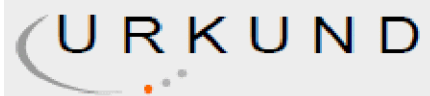
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 that your Research proposal is accepted.

Member Secretary

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 M.D., MNAMS, D.M., Dsc.(Neuro), Dsc (Hon)
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