

# **A STUDY ON THE SECOND STAGE CESAREAN SECTION-MATERNAL AND FETAL OUTCOME**

*A Dissertation submitted to*

**THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY**

in partial fulfillment of the regulations for

the award of the degree of

**M.S. OBSTETRICS & GYNAECOLOGY**

**(BRANCH- II)**

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**DEPARTMENT OF OBSTETRICS & GYNAECOLOGY**

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**MAY- 2022**

## **CERTIFICATE BY THE HEAD OF THE DEPARTMENT**

This is to certify that this dissertation entitled, “**A STUDY ON THE SECOND STAGE CESAREAN SECTION-MATERNAL AND FETAL OUTCOME**” is a bonafide record of the work done by **Dr. R. MUTHU VADHANA** under my guidance and supervision in the **Department of Obstetrics & Gynaecology** during the period of her post Graduate study at Govt. Theni Medical College & Hospital, Theni for the degree of M.S., Obstetrics & Gynaecology from **SEPTEMBER 2020 – SEPTEMBER 2021**.

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This is to certify that that dissertation entitled “**A STUDY ON THE SECOND STAGE CESAREAN SECTION-MATERNAL AND FETAL OUTCOME**” is a bonafide & genuine research work carried out by **Dr. R. MUTHU VADHANA, REG NO: 221916656** postgraduate in Department of Obstetrics & Gynecology Govt. Theni Medical College, Theni, in partial fulfillment of regulations of the Tamil Nadu Dr.M.G.R., Medical University for the award of degree of M.S Obstetrics & Gynecology.

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## **CERTIFICATE BY THE GUIDE**

This is to certify that this dissertation entitled, “**A STUDY ON THE SECOND STAGE CESAREAN SECTION-MATERNAL AND FETAL OUTCOME**” is a bonafide and original work done by **Dr. R. MUTHU VADHANA, REG NO: 221916656**, Post Graduate Student under my guidance **Dr. B.SHANTHIRANI M.D., DGO.**, in the **Department of Obstetrics & Gynaecology** Govt. Theni Medical College & Hospital, Theni for the degree of M.S., (Branch-II) OBSTETRICS & GYNAECOLOGY from SEPTEMBER 2020 – SEPTEMBER 2021.

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**SIGNATURE OF GUIDE**

**Place**

## **DECLARATION**

I **Dr. R. MUTHU VADHANA, REG NO: 221916656**, solemnly declare that the dissertation titled, “**A STUDY ON THE SECOND STAGE CESAREAN SECTION-MATERNAL AND FETAL OUTCOME**” has been prepared by me at the department of Obstetrics & Gynaecology. Govt. Theni Medical College & Hospital, Theni.

This is submitted to **The Tamil Nādu Dr. M.G.R. Medical University**, Chennai in partial fulfillment of the requirements for the award of M.S. Degree Examination (Obstetrics & Gynaecology) to be held in May 2022. This record of work has not been submitted previously by me for the award of any degree or diploma from any other university.

**Place: Theni.**

**Date:**

**Signature of Candidate**

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**Dr. R. MUTHU VADHANA**

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# **INTRODUCTION**



## INTRODUCTION

Cesarean delivery is defined as the birth of fetus through incisions in the abdominal wall and the uterine wall. Cesarean is the most commonly performed major abdominal operation in women all over the world. The rate of cesarean delivery continues to increase despite efforts to constrain operative abdominal deliveries. This is a cause for concern because cesarean section is associated with higher likelihood of adverse outcome for both mother and fetus as compared to vaginal delivery.

Cesarean can be performed before labor, during first and second stages of labor. Second stage of labor begins when cervical dilatation is complete and end with the fetal delivery. There has been considerable debate in the recent years on the duration of the second stage of labor. In the past the second stage of labor was limited to < 2 hours. Recently the duration of second stage is extended upto three hours with regional anaesthesia. Risk factors for the prolonged 2<sup>nd</sup> stage include epidural analgesia, occipito posterior position, longer 1<sup>st</sup> stage of labor, nulliparity, short maternal stature, birth weight, and high station of head at complete cervical dilatation.

Second stage interventions are the methods to facilitate delivery of the fetus in the form of assisted vaginal delivery or by instrumental delivery. Worldwide, 10-20% of deliveries require some form of intervention which is frequently cesarean section. Royal College of Obstetricians and Gynaecologists (RCOG) reports that 6% of primary CS occurs at full dilatation and in 50% of these patients there was no attempt of instrumental vaginal delivery.

A Cesarean section at full dilatation is done when mother requires delivery in the second stage of labor, which may pose a risk to herself or the fetus and cannot be dealt with by assisted vaginal delivery, as in

- Prolonged second stage of labor
- deep transverse arrest
- fetal compromise

A second stage cesarean is technically difficult due to engagement of the fetal head and is associated with increased maternal and fetal morbidity. The maternal morbidity includes major hemorrhage, uterine incision extension into the broad ligament prolonged operating time, bladder injury and pyrexia. Neonatal mortality and morbidity is mainly due to hypoxia and fetal trauma.

As the process of child birth is being a critical moment, it is very important for the health personnel to identify the factors which influence the second stage of labor and take timely interventions to improve the quality of maternal and fetal outcome.

Considering the above facts, I felt it as a strong need to study the maternal and fetal outcome of second stage cesarean section, as it is of increasing trend.

This study includes all women with singleton pregnancy, after 37 weeks, without any medical or obstetrical complications in whom cesarean section done at second stage observed for maternal and perinatal outcome

# **AIM OF THE STUDY**

## **AIM AND OBJECTIVES**

- Indications of second stage cesarean section
- Intra operative and post operative complications associated with second stage cesarean section
- To study the maternal and fetal outcome in second stage cesarean section

**REVIEW OF  
LITERATURE**

## REVIEW OF LITERATURE

Labor is a physiologic process during which the products of conception (ie, the fetus, membranes, umbilical cord, and placenta) are expelled outside of the uterus.

Labor is achieved with changes in the biochemical connective tissue and with gradual effacement and dilatation of the uterine cervix as a result of rhythmic uterine contractions of sufficient frequency, intensity, and duration.

The greatest impediment to understanding normal labor is recognizing its start. The strict definition of labor—*uterine contractions that bring about demonstrable effacement and dilatation of the cervix.*

### **First Stage of Labor**

The first stage begins with regular uterine contractions and ends with full cervical dilatation at 10 cm.

In Friedman's landmark studies of 500 nulliparas, he subdivided the first stage into an early latent phase and an ensuing active phase.

The latent phase, also called pre-labor characterized by slow cervical dilatation up to 3-4 cm. The rate of dilatation accelerates in the

active phase, the total duration estimated as 8-12 hours in the 1<sup>st</sup> and 3-8 hours in subsequent hours.

A scientific approach was begun by Friedman (1954), who described a characteristic sigmoid pattern for labor by graphing cervical dilatation against time. This graphic approach, based on statistical observations, changed labor management. Friedman developed the concept of three functional divisions of labor to describe the physiological objectives of each division.<sup>10</sup>

Labor course divided functionally on the basis of dilatation and descent curves into:

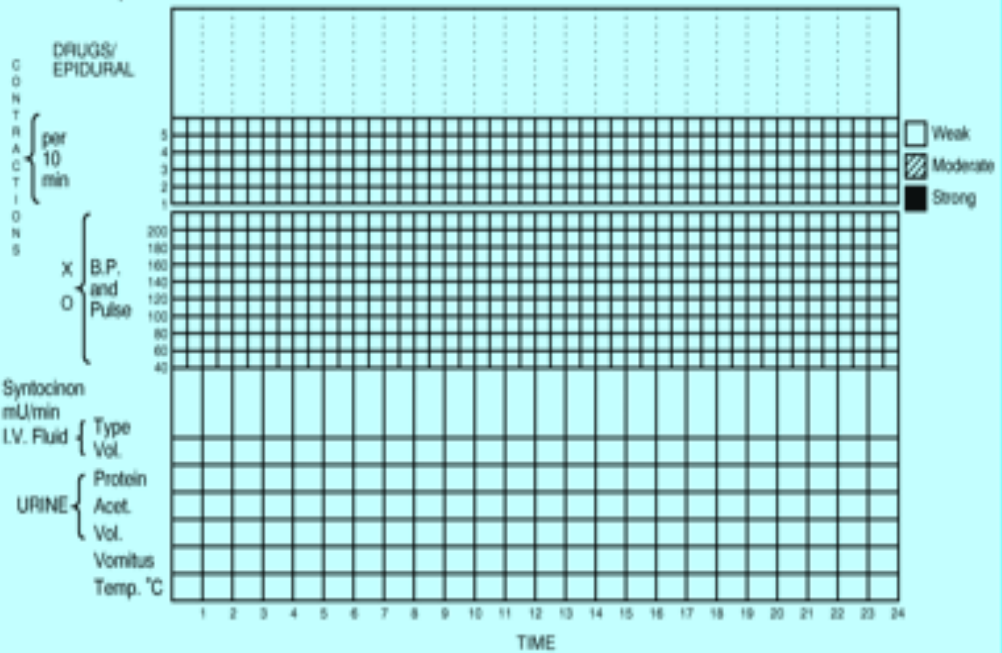
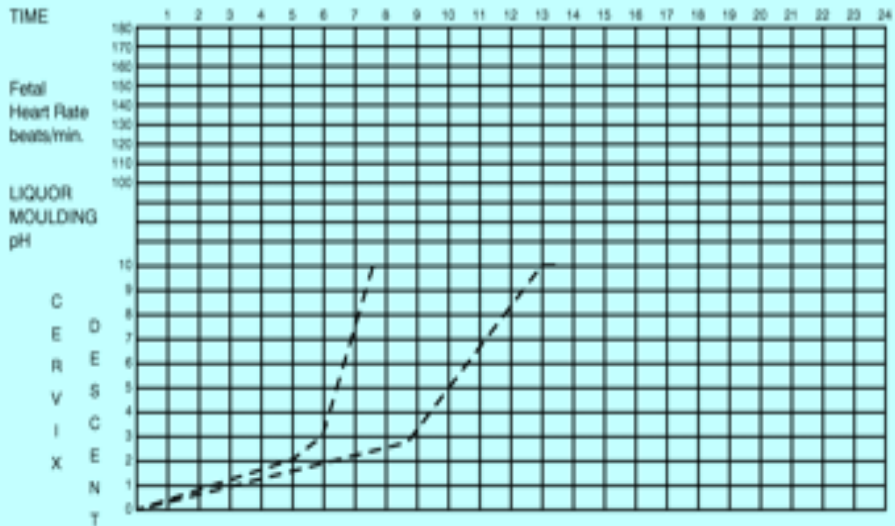
1. a preparatory division, including latent and acceleration phases;
2. a dilatational division, occupying the phase of maximum slope;
3. a pelvic division, encompassing both deceleration phase and second stage concurrent with the phase of maximum slope of descent.(Courtesy of Dr. L. Casey; redrawn from Friedman, 1978.)

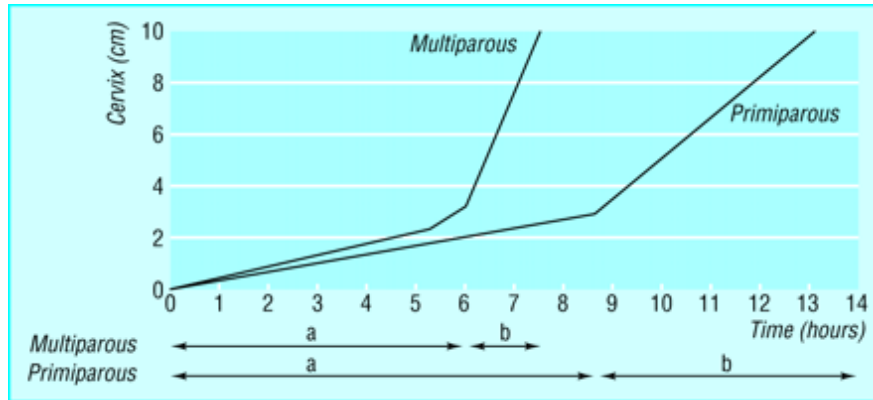
The pattern of cervical dilatation during the preparatory and dilatational divisions of normal labor is a sigmoid curve. Friedman subdivided the active phase into the *acceleration phase*, the *phase of maximum slope*, and the *deceleration phase*



PARTOGRAM

OBSTETRIC	SPECIAL INSTRUCTIONS	ANAESTHETIC	NAME LABEL
	1.	1.	
	2.	2.	
	3.	3.	





### **Prolonged Latent Phase**

Friedman and Sachtleben (1963) defined this by a latent phase exceeding 20 hours in the nullipara and 14 hours in the multipara. These times corresponded to the 95th percentiles. Factors that affected duration of the latent phase included excessive sedation or epidural analgesia; unfavorable cervical condition, that is, thick, uneffaced, or un dilated; and false labor.

Friedman (1972) reported that prolongation of the latent phase did not adversely influence fetal or maternal morbidity or mortality rates, but Chelmow and co-workers (1993) disputed the long-held belief that prolongation of the latent phase is benign.

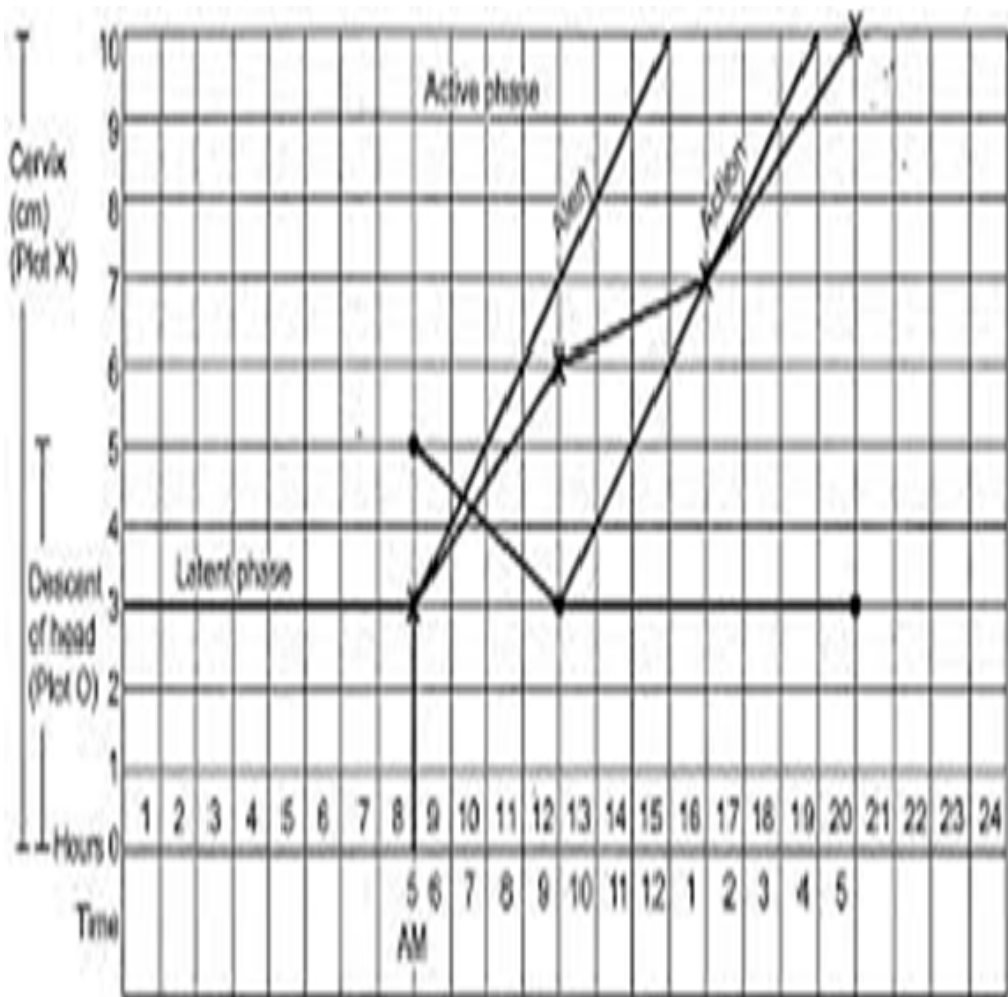
## **Active Labor**

Cervical dilatation of 4 cm or more, in the presence of uterine contractions, can be taken to reliably represent the threshold for active labor.

## **Active-Phase Abnormalities**

Friedman (1972) subdivided active-phase problems into *protraction* and *arrest disorders*.

He defined protraction as a slow *rate* of cervical dilatation or descent, which for nulliparas was less than 1.2 cm dilatation per hour or less than 1 cm descent per hour. For multiparas, protraction was defined as less than 1.5 cm dilatation per hour or less than 2 cm descent per hour. He defined **arrest as a *complete cessation of dilatation or descent***



## **Second stage of labor**

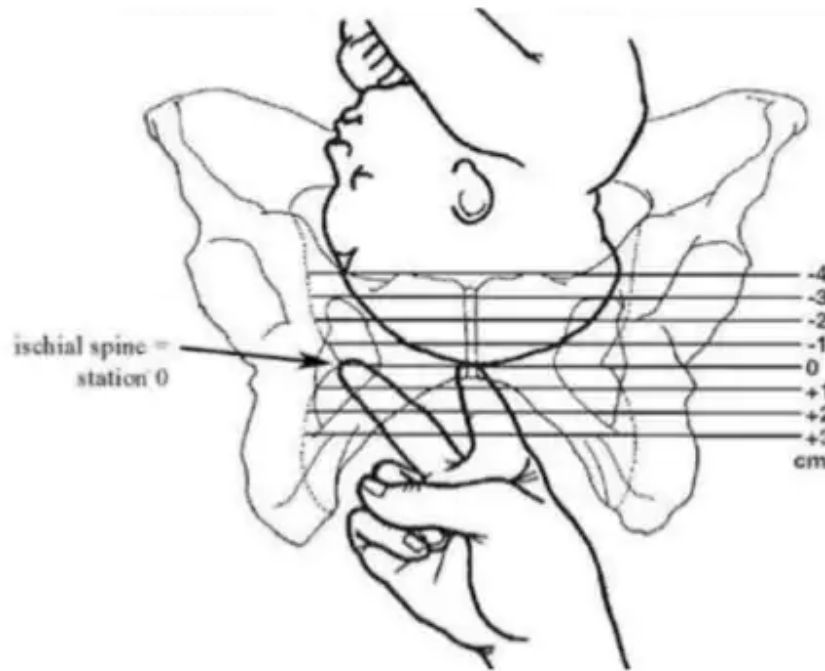
This stage begins when cervical dilatation is complete and ends with fetal delivery. The median duration is approximately 50 minutes for nulliparas and about 20 minutes for multiparas.

In a women of higher parity with a previously dilated vagina and perineum two or three expulsive efforts after full cervical dilatation may suffice to complete delivery.

Conversely, in a women with contracted pelvis, large fetus, or with impaired expulsive efforts from conduction analgesia/ sedation, the second stage becomes abnormally long.

Prolonged 2<sup>nd</sup> stage of labor may lead to fetal hypoxia and lower Apgar scores at birth. Prolonged 2<sup>nd</sup> stage of labor is now a recognized risk factor for pelvic floor trauma and pressure related nerve damage leading to medium and long term pelvic floor dysfunction including symptomatic uterovaginal prolapse, urinary and fecal incontinence.

The modern management of 2<sup>nd</sup> stage of labor will have to balance these risks against the risks and benefits of the obstetrics interventions, such as episiotomy, instrumental vaginal delivery, and cesarean sections, which are used when the 2<sup>nd</sup> stage of labor is prolonged.



**SECOND STAGE** has got 2 phases:

- A) **The propulsive phase:** starts from full dilatation upto the descent of the presenting part to the pelvic floor, may be considered as phase 1 or the “latent phase”. The "latent" phase is the time following complete dilatation until the woman feels a strong urge to push. It is during this latent phase that women experience an initial diminished urge to bear down as the fetus passively descends into the vagina.
- B) **The expulsive phase** is distinguished by the stronger, rhythmic maternal bearing down efforts & ends with delivery of the baby, phase or “the active phase.”

### **Passive second stage of labor**

The finding of full dilatation of the cervix before involuntary expulsive contractions

### **Active second stage of labour**

- The baby is visible
- Expulsive contractions with a finding of full dilatation of the cervix.
- Active maternal effort following confirmation of full dilatation of the cervix in the absence of expulsive contractions (NICE 2007) (11).

### **The length of 2<sup>nd</sup> stage varies according to:**

- Maternal positioning
- malposition of the fetus
- Station at completion of first stage
- Quality of the uterine contractions
- Use of oxytocin augmentation
- Pushing efforts of the woman
- Type of analgesia <sup>12</sup>



**It can be described under three headings:**

Fault in the power, passage and passenger.

**Fault in the power**

- Uterine inertia
- Inability to bear down
- Epidural analgesia
- Constriction ring



### **Fault in the passage**

- Contracted pelvis & disproportion
- Undue resistance of the pelvic floor/perineum due to the spasm/old scarring
- Soft tissue pelvic tumor

### **Fault in the passenger**

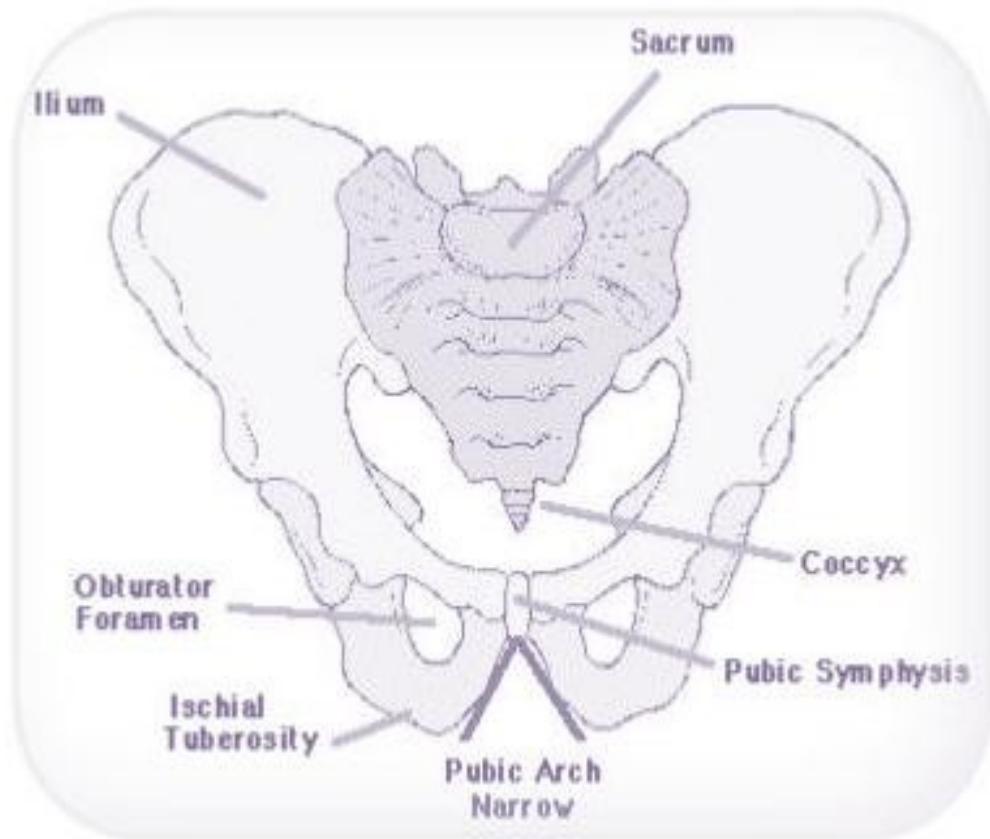
- Malposition
- Malpresentation
- Big baby
- Congenital malformation of the baby

The risks associated with obstetric complications and different modes of delivery are more commonly measured in terms of maternal and perinatal mortality.

### **Anatomical and physiological factors influencing the 2<sup>nd</sup> stage of labor:**

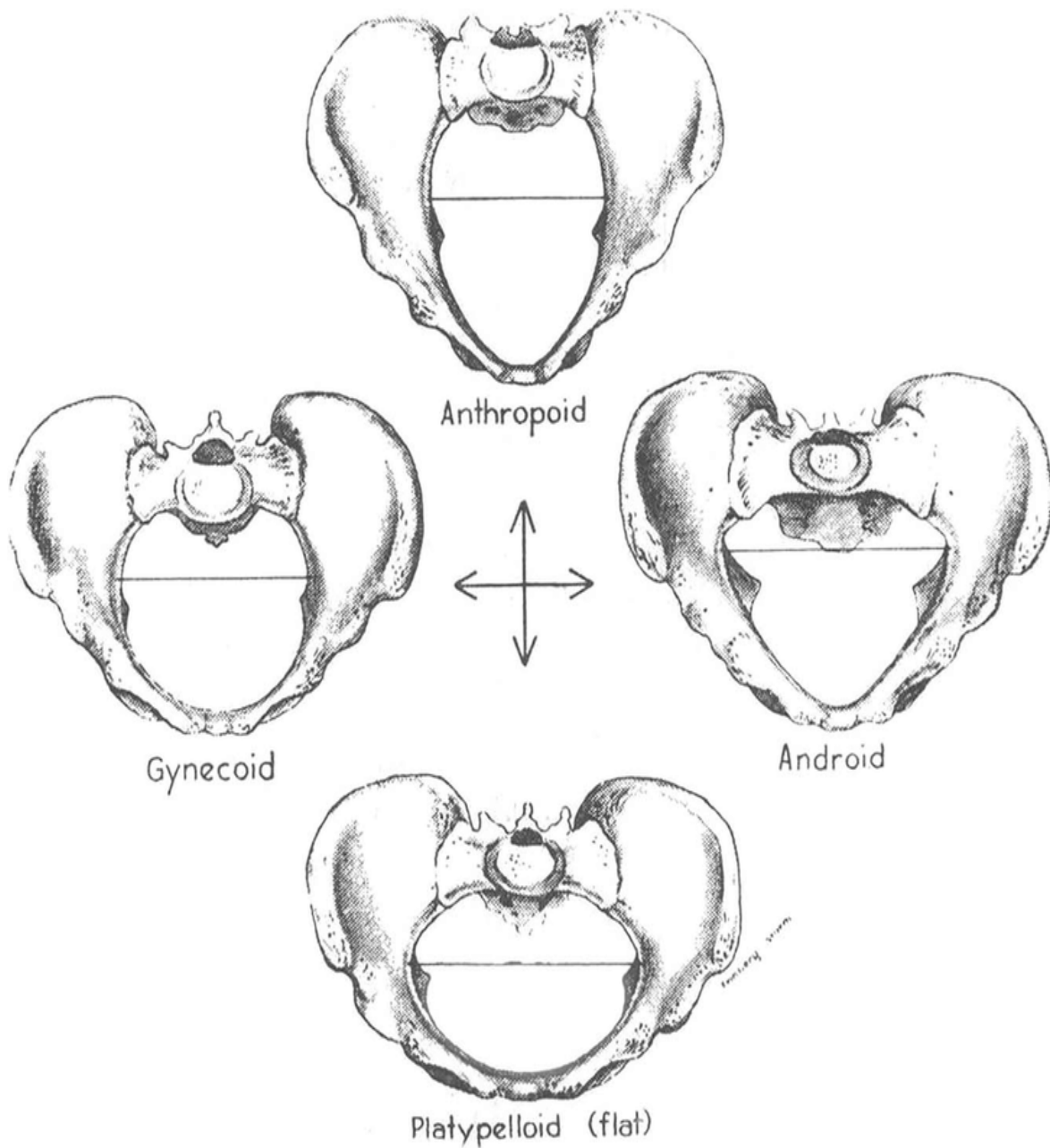
The female pelvis has a wide birth canal and wide pubic arch. Because of softening of the sacroiliac ligaments and the pubic symphysis, some expansion of the pelvic cavity can occur. The soft tissues also become more distensible than in the non-pregnant state.

and substantial distension of the pelvic floor and vaginal orifice occurs during the descent and birth of the head.



In the absence of maternal anthropoid pelvic shape, majority of fetuses enter the pelvic inlet in the occipito transverse (OT) position, descend through the cavity, and simultaneously execute an internal rotation at the level of the mid pelvis into the occipito anterior (OA) position, in order to exit the pelvic outlet. These movements constitutes the mechanism of labor and are influenced by the shape and size of the maternal pelvis as well as the size of the fetal head.

Descent through the pelvic cavity, level at which the internal rotation occurs, is influenced by *the sacral position and its configuration, the size/prominence of the ischial spines, the degree of convergence of the pelvic side walls, and the angle of the subpubic arch.*



For eg., the rare platypelloid pelvic shape, descend occurs entirely in the occipito transverse position and ends with a late rotation into the OA position at the perineum.

In the anthropoid pelvis, a completely posterior mechanism may occur, with delivery of the fetus “face to pubis”.

A combination of minor pelvic anatomical variations may therefore interfere with the descent and / rotation of the presenting part leading to mid pelvic arrest in the anterior, posterior or transverse diameters subsequent prolongation of the second stage of labor.<sup>13</sup>

Distension of the cervix in the late 1<sup>st</sup> stage and vagina in the 2<sup>nd</sup> stage causes a surge of oxytocin (Ferguson reflex) to enhance uterine contractions.

Generally, the bearing-down reflex will be triggered when the fetal head reaches at least a 0 to a +1 station. It is at this station that women commonly experience the first urge to bear down. Therefore, station of the fetal head is an important consideration when assessing the woman's transition from the latent to active phase of the second stage.

As the head descends through the pelvis, feces frequently are expelled by the woman. With further descent, the perineum begins to

bulge and the overlying skin becomes stretched. Now the scalp of the fetus may be visible through the vulvar opening. At this time, the woman and her fetus are prepared for delivery.

In the management of the second stage of labor, if the woman has an epidural in situ and the FHR pattern is normal, 1 hour may be allowed for the presenting part to descend with uterine contractions before starting to push. During this hour, it is important to ensure that good contractions are present and, if there are any concerns regarding the FHR, delivery could be expedited.<sup>13</sup>

In most cases, bearing down is reflexive and spontaneous during second-stage labor. Occasionally, a woman may not employ her expulsive forces to good advantage and coaching is desirable. Her legs should be half-flexed so that she can push with them against the mattress. When the next uterine contraction begins, she is instructed to exert downward pressure as though she were straining at stool.

In a randomized study reported that open-glottis pushing while breathing out was superior to the closed-glottis breath-held Valsalva-type pushing. The former method resulted in a shorter second stage and better cord acid-base values.<sup>14</sup>

A woman is not encouraged to push beyond the completion of each contraction. Instead, she and her fetus should be allowed to rest and recover. During this period of actively bearing down, the fetal heart rate auscultated immediately after the contraction is likely to be slow but should recover to normal range before the next expulsive effort.

The uterine contractions during this phase are more frequent, stronger and longer lasting. The uteroplacental circulation therefore, has less time to replenish the oxygenated blood in the intervillous space before the onset of next contractions.

The increased skeletal muscular activity generates a host of metabolic products including lactic acid, which may be passed on to the fetus.

The descent of the head into the pelvic cavity is associated with the fetal head and eyeball compression, raised intracranial pressure and a vagally mediated fetal heart decelerations, typically early and variable decelerations.

The rate of fall of PH in the fetus is also more rapid during the active phase of the 2<sup>nd</sup> stage of labor than during the 1<sup>st</sup> stage.<sup>15</sup>

In a nulliparous woman if, after 2 hours of effective expulsive

efforts, delivery is not imminent and there has been no significant progress, the situation needs to be reassessed with a view to an assisted instrumental (operative) vaginal delivery.

In a multiparous woman, delivery is generally expected within 60 minutes of effective expulsive efforts, and failure to achieve this should raise suspicions of malposition, malpresentation, or disproportion.

#### **PROLONGED SECOND STAGE OF LABOUR:**

For nulliparas , it is defined as >3 hours with,& more than 2 hours without, regional analgesia. In the parous women, >2 hours with,& more than 1 hour without ,regional analgesia.<sup>9</sup>

## Abnormal Labor Indicators

<b>Indication</b>	<b>Nullipara</b>	<b>Multipara</b>
Prolonged latent phase	>20 h	>14 h
Average second stage	50 min	20 min
Prolonged second stage without (with) epidural	>2 h (>3 h)	>1 h (>2 h)
Protracted dilation	< 1.2 cm/h	< 1.5 cm/h
Protracted descent	< 1 cm/h	< 2 cm/h
Arrest of dilation	>2 h	>2 h
Arrest of descent	>2 h	>1 h
Prolonged third stage	>30 min	>30 min



## **DELAY IN THE 2<sup>ND</sup> STAGE OF LABOUR:**

Descent of the presenting part at a rate of  $> 1$  cm/hr in nulliparous women and  $> 2$  cm / hr in parous women was proposed as normal progress during the 2<sup>nd</sup> stage of labor.<sup>10</sup>

In clinical practice, the precise time of full cervical dilatation is unknown. Therefore the duration of 2<sup>nd</sup> stage of labor is almost always underestimated. Concern for fetal wellbeing has been the rationale for obstetric intervention to shorten the 2<sup>nd</sup> stage of labor.

A partogram for the 2<sup>nd</sup> stage labor has been proposed. Seizer et al used a scoring system to study the mean duration of 2<sup>nd</sup> stage of labor, concluded that the optimal duration of 2<sup>nd</sup> stage of labor is no more than 90 minutes for nulliparous and no more than 60 minutes for multiparous women.<sup>17</sup>

Ethnic variation in the duration of 2<sup>nd</sup> stage have also been described. African American and Puerto Rican women have a shorter 2<sup>nd</sup> stage.

## **FETAL AND MATERNAL FACTORS CAUSING DELAY:**

There is an increased risk of uterine dysfunction with increased maternal age. There is also a correlation between body mass index and delay in 2<sup>nd</sup> stage of labor. BMI of above 30kg/m<sup>2</sup> was a risk factor for cesarean delivery.<sup>18</sup>

Pelvic masses such as fibroids or ovarian cysts may cause delay or failure to progress in 2<sup>nd</sup> stage, but are rare causes for obstruction. Fetal head position, size and station are important in determining progress in the 2<sup>nd</sup> stage of labor.

In a recent analysis of the risk factors for arrest of descent, Fenstein et al(2002) found the major risk factors were nulliparity, fetal macrosomia, epidural analgesia, hydramnios, hypertensive disorders, and gestational diabetes. These cases were delivered by cesarean section in 20.6%, vacuum extraction in 74% and by forceps in 5.4%. newborns had significantly high rates of low Apgar at 1 and 5 minutes as compared with controls.

Malposition of the fetal head is a common cause of delay in the 2<sup>nd</sup> stage of labor. majority of fetuses rotate into the favourable occipito anterior position, either spontaneously or in response to oxytocin administration.

### **Epidural analgesia and 2<sup>nd</sup> stage of labor:**

The effect of an epidural analgesia on the progress of 2<sup>nd</sup> stage of labor is controversial. A meta analysis showed, epidural analgesia provided effective pain relief but was also associated with a prolonged 2<sup>nd</sup> stage of labor, increased incidence of fetal malposition, use of oxytocin and instrumental deliveries.(Howell 2000). These effects are believed to be due to the loss of the Ferguson reflux.<sup>16</sup>

A Cochrane study concluded that the epidural analgesia in labor is associated with a longer 2<sup>nd</sup> stage, increased incidence of fetal malposition and requirement for oxytocin and instrumental delivery.<sup>19</sup>

### **Complications:**

Women with intrapartum pyrexia and their infants more likely to be screened for sepsis. Nausea, vomiting and pruritis are common immediate complications. Dural puncture and inadvertent subarachnoid injection of local anaesthetics may also occur. This may lead to significant and sometimes persistent headache.

Sympathetic nerve block resulting in peripheral vasodilatation, hypotension, reduction in cardiac output, which may impair uteroplacental perfusion and cause fetal hypoxia.

Other immediate complications include cardiorespiratory arrest, vestibulocochlear dysfunction, hematoma and meningitis. Some may have urinary incontinence and may need urinary drainage

**Fetal stress during the 2<sup>nd</sup> stage of labor:**

There is reduction in the flow of oxygenated blood into the intervillous space, because of the increased frequency, duration, and amplitude of the uterine contractions. The fetus responds to this hypoxemia by activating a cascade of adrenergic responses, including a shift from aerobic to anaerobic metabolism, leads to the production and accumulation of lactic acid. Katz et al showed a significant rise in umbilical cord lactate concentrations when the 2<sup>nd</sup> stage of labor is > 30 minutes.

**OUTCOME OF PROLONGED 2ND STAGE LABOR PRIMARY OUTCOME:**

It is defined as a spontaneous vaginal delivery of a baby with no signs of asphyxia (ie, Apgar score at 5 min.>7 and neonatal arterial PH >7.10,when available).

## **SECONDARY Clinical outcomes MATERNAL:**

- Intrapartum fever
- Cesarean delivery
- Instrumental delivery
- Perineal trauma, including 3<sup>rd</sup> degree / 4<sup>th</sup> degree perineal tears
- Postpartum hemorrhage, as blood losses of > 500 ml with vaginal delivery & > 1000 ml with cesarean delivery.
- Chorioamnionitis
- Dehydration
- Rupture uterus
- Anemia
- PID, Puerperal sepsis
- Distress
- Subinvolution

## **FETAL:**

- Hypoxia
- Intracranial injury
- Pulmonary infection

- 5 min Apgar score of <7
- Neonatal arterial PH < 7
- Any neonatal trauma (cephalhematoma, other hematoma, fracture, and facial or brachial palsy admission to neonatal intensive care unit)
- Later- delayed milestones

**Management of delayed 2<sup>nd</sup> stage:**

If there is delay, *Exclude the following:*

- Full bladder
- Cephalo-pelvic disproportion
- Malpresentation of the fetal head, e.g. occipito-posterior or occipito transverse, or deflexed fetal head.
- Inelastic perineal tissues, especially in the older primipara.
- Inadequate uterine activity Observe for the following possible indicators of obstructed labour
- Maternal and fetal tachycardia
- Hypertonus with frequent, strong contractions
- Vaginal bleeding

- Haematuria
- Maternal temperature
- Constant severe abdominal pain
- Physiologic retraction ring (Bandl's ring)

### **Management**

- Catheterise the bladder
- Abdominal and pelvic assessment
- Ultrasound can improve the accuracy of determining the position of the baby
- Provided there are no maternal or fetal complications, in consultation with an obstetrician, decide whether there is any advantage to waiting.
- If there is a reason for the second stage to be expedited, decide on the most appropriate type of instrumental delivery, e.g. simple forceps, rotational forceps or ventouse.
- Consider trial of forceps / ventouse in operating theatre if difficulty is anticipated.
- Syntocinon augmentation in the second stage for a primigravida is

a safe option to overcome inadequate uterine activity. Extreme caution should be exercised in a multigravida.

Prolonged labor is not always predictable, but good prenatal care with early detection of CPD and malpresentation, monitoring with partography during labor and early reassessment when progress crosses the alert line are measures that may help prevent prolonged labor.

As the commonest cause of delay in the active phase is inadequate contraction, ARM and augmentation with oxytocin infusion drip are beneficial in most cases. When augmentation fails, cesarean section is needed. Prophylactic broad spectrum antibiotics should be considered in all cases where the membrane is ruptured.

### **Common indication of LSCS**

#### **1) Fetal distress**

This indication accounts for 10-15% of the recent increase in caesarean section rate in hospital practice. The term fetal distress is too broad and too vague to be applied with any precision to clinical situations.

Identification of fetal distress based on FHR pattern is imprecise and controversial. There are several research efforts in this direction with regards to



the prediction of neonatal outcome.

American college of obstetricians and gynecologists(1995) recommended intermittent auscultation or continuous electronic fetal monitoring as acceptable methods for antepartum surveillance in both high risk and low risk pregnancies except that the recommended interval between checking the heart rate is longer in uncomplicated pregnancies.

Most of recent literature disregards the importance of intrapartum meconium staining of liquor as a sign of fetal distress when considered in isolation. But thick meconium associated with FHR variation should alert the obstetrician and must be followed with invasive fetal monitoring and adequate precaution should be taken to prevent meconium aspiration at that time of delivery.

This indication has thus lead to slight increase in the cesarean section rate but that perinatal mortality is still the same.

## **2) Cephalopelvic disproportion**

This is one of the most frequent indication (40-50%) when the pelvis is so contracted that, even after mutilation a dead child cannot be delivered per vaginum, it is said to be an absolute indication. Such indications are seldom met with in present day obstetrics. In the few

cases of marked pelvic deformity or disproportion elective section is appropriate.

In most cases i.e., in more common borderline pelvis and minor degrees of disproportion the correct decision can be made only after a trial of labor with proper use of partograph.

### **3) Failure to progress in labor**

The term “dystocia” (abnormal labor) is vague. It includes abnormalities related to birth passage, the passenger and the labor forces. The ultimate result being failure to progress in labor.

“Failure to progress” is merely a description term and not a diagnosis e.g. prolonged latent phase, arrest of active phase dilatation, arrest of descent of fetal head.

### **ARREST OF LABOUR IN FIRST STAGE- DEFINITION (ACOG)**

Spontaneous labour: more than or equal to 6cm dilatation with membrane rupture and one of the following

a) 4 hrs or more of adequate contractions with no cervical change

b) 6 hrs or more of inadequate contractions with no cervical change

### **ARREST OF LABOUR IN SECOND STAGE(ACOG)**

Before diagnosing arrest in second stage,if maternal and fetal conditions permit, atleast 2hrs of pushing in multiparous women and atleast 3hrs of pushing in nulliparous women should be considered.

Arrest of active phase may be due to:

- a) Inadequate powers of labor
- b) Passenger-passage problems

Only if arrest of progress persists despite adequate labor should a diagnosis of disproportion to be made during the active phase of labor. Avoidance of intervention during latent phase of labor, coupled with supportive and aggressive management of the true active phase can reduce the need for operative delivery.

Operative delivery is indicated when efforts to correct dysfunctional labor by appropriate use of analgesics, ambulation or oxytocin have not produced dilatation and descent.

Risk to fetus was apparent if labor is not completed within 24 hours after rupture of membranes, especially when treated with sedatives or stimulated with oxytocin. These cases are best monitored by partograph whereas early diagnosis of dysfunctional labor can be made.

Dumont et al (2001) reported a cesarean section rate 22% in cases of protracted labor (labor over 12 hours in duration or when it crossed the partographic action line) .

WHO partographic studies (1994) showed a cesarean section rate of 0.6% when labor remained on the left of the alert line in partography, but it was 21.8% when the action line was reached. This shows how critically important is the correct diagnosis of the active phase of labor and the monitoring of the progress of labor.

- Rouse DJ, et al demonstrated as, the duration of the second stage increased, spontaneous vaginal delivery declined, from 85% when the duration was <1 hr to 9% when it was > 5hrs. He also states that, relative to the first hour of expulsive efforts, the chances of a spontaneous vaginal deliveries of a newborn infant without signs of asphyxia decreased significantly every hour. The risk of postpartum hemorrhage and intrapartum fever increased significantly after 2 hours of pushing.<sup>20</sup>
- B.Schiessl et al found that mean length of the second stage was 70 min. No correlation was found between birth weight & maternal age. In univariate analysis, parity, oxytocin augmentation, and epidural analgesia as well as occipito-

posterior presentation were significant parameters associated with a prolonged second stage of labor.<sup>21</sup>

- Allen VM, et al, in his study of states that, Risks of both maternal and perinatal adverse outcomes rise with increased duration of the second stage, particularly for duration longer than 3 hours in nulliparous women & longer than 2 hours in multiparous women.<sup>22</sup>
- Janni W et al demonstrated, there is no evidence that prolonged 2nd stage of labor is a serious disadvantage to the fetus, if adequate monitoring is provided. The increase of maternal morbidity in patients with prolonged labor may be partially attributed to a higher rate of operative procedures.<sup>23</sup>
- Altman MR, Lydon-Rochelle MT reported that there is a strong association between prolonged 2nd stage and operative delivery & no association between prolonged 2nd stage and adverse neonatal outcomes. Meanwhile, approaches for promoting a normal 2nd stage of labor are available to care givers, such as maternal positioning and pain relief measures and also promoting effective pushing techniques.<sup>24</sup>
- Sounders NS et al, in his study of 'Neonatal & maternal

morbidity in relation to the length of the 2nd stage of labor' states that the duration of the 2nd stage of labor has a positive independent association with early maternal morbidity.<sup>25</sup>

- Kuo YC et al. proved that the maternal and perinatal well-beings from the normal second stage group did not appear to be more favorable than the prolonged second stage. Under monitored condition, if the fetal heart rate is considered normal, then the natural labor course could be continued.<sup>26</sup>
- Cohen, in a study of 4403 nulliparous women, was the first to observe that, although certain maternal morbidities were increased when the second stage of labor was prolonged, neither 5 minutes Apgar scores nor perinatal death was related to second stage duration.<sup>27</sup>
- Cohen (1977) investigated the fetal effects of second-stage labor length at Beth Israel Hospital. He included 4403 term nulliparas in whom electronic fetal heart rate monitoring was performed. The neonatal mortality rate was not increased in women whose second-stage labor exceeded 2 hours. Epidural analgesia was used commonly, and this likely accounted for the large number of pregnancies with a prolonged second stage. These data

influenced decisions to permit an additional hour for the second stage when regional analgesia was used.<sup>27</sup>

- Menticoglou and colleagues (1995a, b) challenged the prevailing dictums on the duration of the second stage. These arose because of grave neonatal injuries associated with forceps rotations to shorten second-stage labor. As a result, they allowed a longer second stage to decrease the vaginal operative delivery rate. Between 1988 and 1992, second-stage labor exceeded 2 hours in a fourth of 6041 nulliparas at term. Labor epidural analgesia was used in 55 percent. The length of the second stage, even in those lasting up to 6 hours or more, was not related to neonatal outcome. These results were attributed to careful use of electronic monitoring and scalp pH measurements. These investigators concluded that there is no compelling reason to intervene with a possibly difficult forceps or vacuum extraction because a certain number of hours have elapsed. They observed, however, that after 3 hours in the second stage, delivery by cesarean or other operative method increased progressively. By 5 hours, the prospects for spontaneous delivery in the subsequent hour are only 10 to 15 percent.<sup>28</sup>

- Myles and Santolaya (2003) analyzed both the maternal and neonatal consequences of prolonged second-stage labor in 7818 women in Chicago between 1996 and 1999. Maternal outcomes in relation to the duration of second-stage labor are shown in Table 20-3. Neonatal mortality and morbidity rates were not related to the length of the second stage.<sup>29</sup>
- Paterson CM, Saunders et al ,in their study, the duration of the second stage in women not using epidural analgesia was similar to previous findings, but in those using epidural analgesia, the duration of the second stage was longer than has been reported previously, possibly reflecting a more conservative approach to operative intervention. Survival analysis indicates that in multiparae not using epidural analgesia the likelihood of spontaneous vaginal delivery after 1 h in the second stage was low, but in those multiparae using epidural analgesia and in all nulliparae there was no clear cut-off point for expectation of spontaneous delivery in the near future; they continue to give birth at a steady rate over several hours. While maternal and fetal conditions are satisfactory, intervention should be based on the rate of progress rather than the elapsed time since full cervical dilatation.<sup>30</sup>



- Sung et al, found that a second stage of labor of >4 hours was associated with an increase in unintentional hysterotomy extensions at cesarean delivery and prolonged operative time. In the PEOPLE trial, there were no data about adverse events that occurred during cesarean delivery (such as hysterotomy extension or bladder injury). These complications may be more frequent in the case of cesarean delivery after 2 or 3 hours of pushing efforts, compared with cesarean deliveries performed during the first 2 hours of active second stage of labor.<sup>31</sup>

According to Alexander James, Leveno, Kenneth et al cesarean deliveries performed in second stage were associated with longer operative time, epidural analgesia, chorioamnionitis and higher birth weights

Most of the multiparous women come to the hospital in second stage of labour. About 1 in 4 primary cesarean deliveries take place during the second stage of labor. Not only is second-stage surgery technically more difficult, but the fetus is at risk of hypoxia-related morbidity. Second-stage cesarean deliveries take significantly longer time than those done in the first stage of labor.

Intraoperative complications were significantly more frequent when cesarean section was done in the second stage of labor because

of higher rates of uterine atony, extension of a "T" or "J" uterine incision. Fetal injuries are more common in the second-stage. There is higher risk of intraoperative bleeding and requirement for blood transfusion.

Cesarean section in the second stage of labor is associated with increased risks of maternal morbidity, including major hemorrhage, uterine incision extension into the broad ligament, and prolonged operating time. Difficult delivery of the fetus is frequent due to a deeply impacted head in the pelvis. Several studies have compared second stage cesarean section with instrumental vaginal delivery, but only one has compared maternal and perinatal morbidity associated with cesarean section in the second stage of labor .A study by cebekulu et al showed that cesarean section in the second stage of labor is associated with increased maternal and neonatal morbidity

Cebekulu et al reporting on 39 cases and 39 controls, found that second-stage caesarean section was associated with more postoperative fever.

Cheng et al, found that multiparous women with a second stage of 3 hours or greater are at a increased risk for operative deliveries, peripartum morbidity and undesirable neonatal outcomes.

In the study by Shahla Baloch et al ,wound infection was present in 8.33% cases.

Maternal and infant outcomes may be affected by the timing of caesarean delivery. Cesarean section at full cervical dilatation with an impacted fetal head can be technically difficult and associated with increased trauma to the lower uterine segment and adjacent structures, as well as increased PPH, hemorrhage and infection. Recent data suggest that cesarean delivery in labor is associated with increased maternal morbidity compared with cesarean delivery with no labor. Second stage caesarean section is associated with obstetric hemorrhage, bladder injury, extended uterine tear leading to broad ligament haematoma, infection and longer hospital stay (Landon et al., 2005). Controversies regarding the fetal outcome in the cases of caesarean sections in second stage of labor are seen throughout literature. The delay of caesarean delivery until the second stage of labor may put the fetus at risk for morbidity. This might be due to intra-operative fetal hypoxia caused by strong uterine contraction, deeply impacted fetal head and longer duration of second stage labor. Neonatal morbidity in terms of NICU admissions, fetal acidemia, hypoxemia, prolonged NICU stay is reportedly higher in second stage caesarean sections.

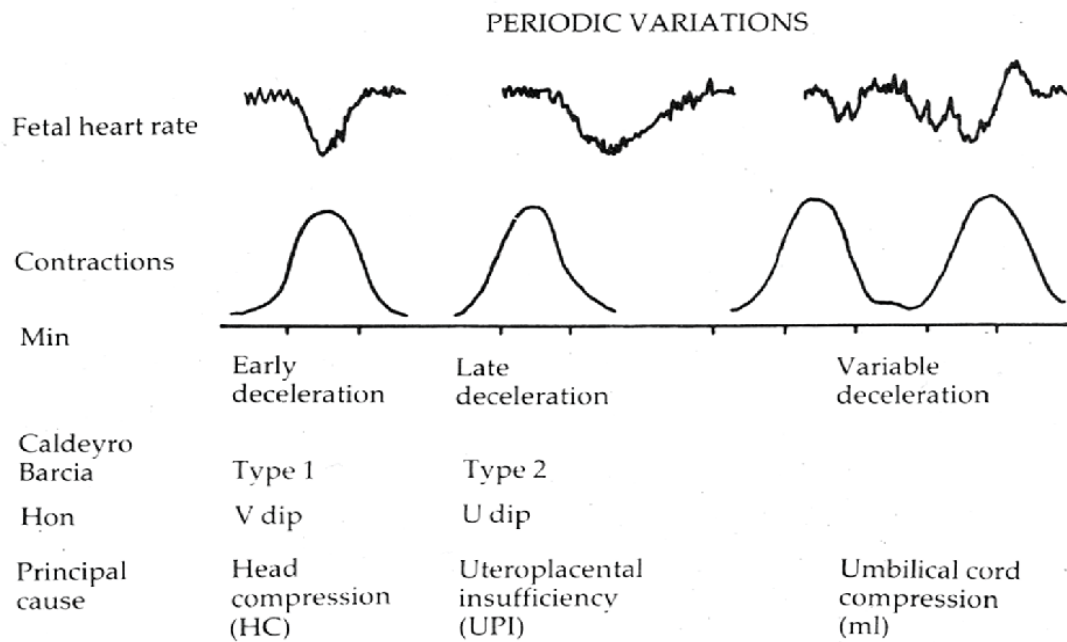
## **FETAL HEART RATE VARIATIONS**

Low et al. showed that there was an approximately 1 hour window from the start of FHR patterns containing minimal baseline variability and late or prolonged decelerations, which preceded fetal asphyxia decompensation and newborn morbidity. In a case-control study of fetuses with umbilical artery pH less than 7.05, Ingemarsson et al, concluded that the 4-year follow up developmental screening test was worse when a 'pathologic' tracing lasted for more than 60 minutes. During labor, there are three ways that the FHR pattern can develop abnormal characteristics:

(1) most commonly, the FHR tracing is normal at the onset of labour and decelerations gradually develop over time;

(2) when a sentinel event such as uterine prolapse or placental abruption occurs, the FHR may suddenly develop a terminal bradycardia; and

(3) although not common, the fetus may experience an adverse effect prior to labor and the FHR tracing on admission reveals abnormal characteristics. By far, the most common pattern is the one that develops over time.



Diagrammatic representation of periodic variations in fetal heart rate

Studies that have prospectively or retrospectively evaluated the relationship between FHR patterns and metabolic acidemia confirm the value of the four assumptions commonly used for interpreting FHR patterns in clinical practice. When this work is analyzed as a whole, the pattern of developing acidemia that is shown in FHR changes becomes apparent. Acute acidemia start interruptions in fetal oxygenation and the occurrence of decelerations, e.g., late or variable. When the decelerations are unabated, the first beginning change in decelerations become deeper and longer in duration. Tachycardia usually develops due to increase of sympathetic stimulation such as increase of blood catecholamine level. The fetus can not increase stroke volume to

increase cardiac output. Therefore, a faster heart rate is the mechanism by which the fetus increases cardiac output to compensate for recurrent hypoxial events. FHR baseline variability begins to diminish indicating acidemic changes when compensatory measures begin to fail. If the acidemia is not reversed, the heart rate decreases and eventually terminal bradycardia will occur. It is important to remember that this pattern undoubtedly has variations. For example, this pattern progresses through each phase faster in a fetus with a pre existing chronic hypoxia as can occur in preeclampsia, or a fetus at increased risk for asphyxia damage for other reasons such as infection or prematurity. Similarly the fetus exposed to tachysystole may not have an inter contraction interval of long enough duration to increase the heart rate and in this instance, the expected tachycardia may not develop before the variability decreases and a terminal bradycardia ensues. However, this pattern should be taught to healthcare providers who manage women in labor and viewed as a trigger for close observation. This pattern includes consideration of the effect of duration and severity . Action should be taken when the variability becomes persistently minimal in the presence of worsening decelerations. To evaluate the neonatal outcome, APGAR score alone

is a poor indicator of neonatal asphyxia and/or acidosis. The fetal acid-base status was the most reliable index of fetal oxygenation.

Delivery by cesarean section is associated with increased maternal mortality and morbidity, particularly wound infection. Moreover, it has now been well documented that the steep rise in cesarean section rates over the last 20 years has not been responsible for the dramatic improvement in perinatal mortality observed during that time. In addition, it is more expensive to deliver women by cesarean section than vaginal route.

## **COMPLICATIONS OF CAESAREAN SECTION**

Complications associated with caesarean section grouped into immediate, intermediate and late complications, which are listed below:

### **Immediate**

- Postpartum haemorrhage (>1000ml)
- Wound haematoma
- Intra-abdominal haemorrhage
- Bladder/bowel trauma (more common in patients who have had previous abdominal surgery)

**Neonatal:**

- transient tachypnoea of the newborn fetal lacerations (1-2% risk, higher with previous membrane rupture)

**Intermediate Infection:**

- urinary tract infection
- endometritis
- respiratory (higher risk if general anaesthetic used)
- Venous thromboembolism

**Late**

Urinary tract trauma (fistula)



# **MATERIALS AND METHODS**

## **MATERIALS AND METHODS**

The study was conducted in patients women with singleton low risk pregnancy, after 37 completed weeks of gestation admitted under obstetrics and gynecology in Theni Medical College Hospital between September 2020 –September 2021 who under went second stage cesarean section- maternal and fetal outcomes.

Sample size : 100 patients

After ethical clearance and getting consent from patients, the study was carried out

### **Place of study :**

Government Theni medical college hospital-labor ward.

### **Type of study: Prospective observational study**

- Prospective observational study of all women with singleton, cephalic fetus at term delivered by second stage LSCS - with/without trial of instrumental delivery
- induced/ spontaneously in labor

**Study period:** 1 year

### **INCLUSION CRITERIA**

- Singleton live pregnancy irrespective of parity
- Period of gestation > 37 weeks
- Cephalic presentation
- Without previous LSCS

### **EXCLUSION CRITERIA**

- Multiple pregnancy
- IUD
- Preterms
- Medical complications associated with pregnancy

### **METHOD OF COLLECTION OF DATA**

- All women with singleton pregnancy, after 37 completed weeks, without any antenatal/medical complications were observed for the progress of second stage of labor
- Selection of the patient based on inclusion & exclusion criteria. The analysis was confined to participants who reached the second stage of labor. Duration of the second stage was calculated from the

cervicalexamination that reveals full dilatation until delivery.

- Decision regarding ARM/IOL/synto acceleration/were followed, according to labor room protocol. Continuous monitoring of FHR/contractions was done every 5 min during 2nd stage.
- The second stage of labor was analyzed based on the duration ie ,<1 hour vs >2 hours for nulliparous and <30minutes vs >1 hour for multiparous.
- Patients who underwent cesarean section in second stage of labor were studied for maternal and fetal outcome

# **OBSERVATIONS AND RESULTS**

## OBSERVATIONS AND RESULTS

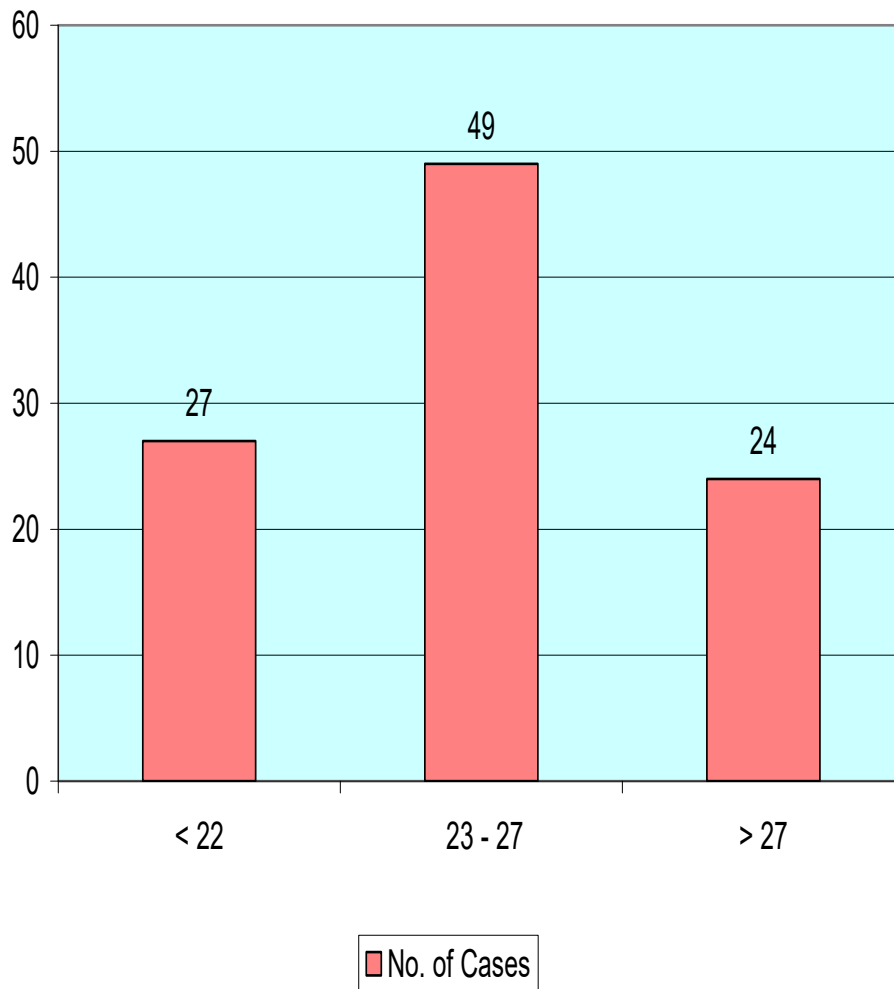
TABLE – 1

### DISTRIBUTION OF AGE

Age	No. of Cases
< 22	27
23 – 27	49
> 27	24
Total	100
Mean	25.08
SD	2.967

Majority of the cases (49%) were under the age group of 23 – 27 followed by <22 age group and 24 cases in > 27 age group.

### AGE DISTRIBUTION



**TABLE – 2**

**DISTRIBUTION OF GESTATIONAL AGE IN WEEKS**

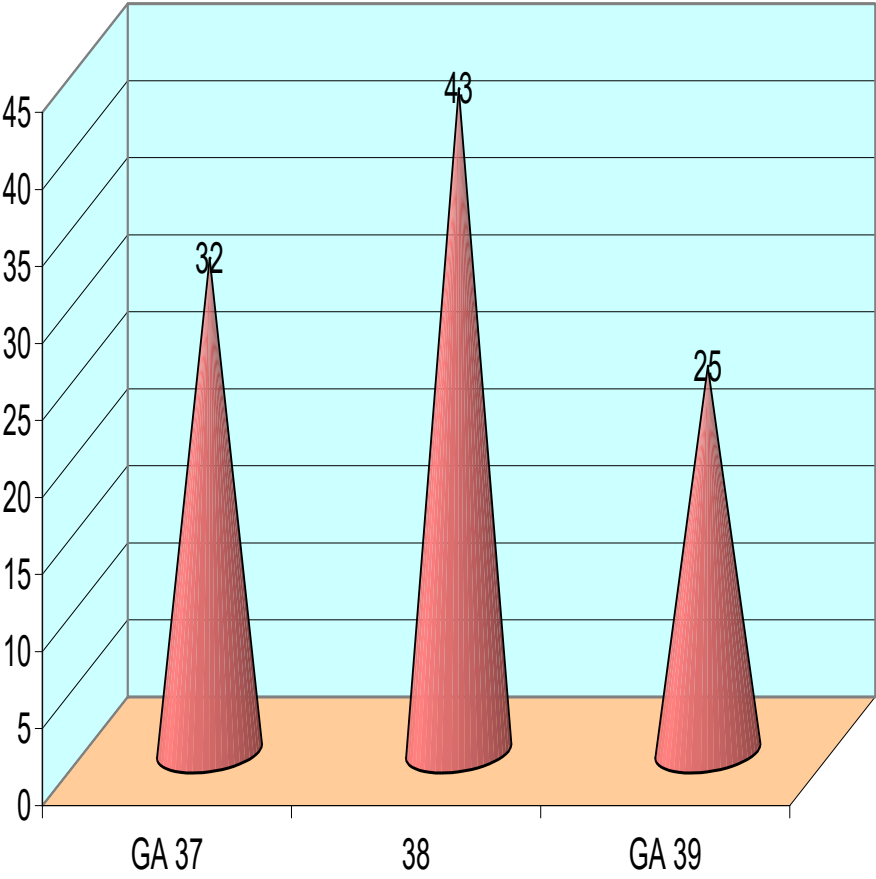
The gestational age at delivery and the no of cases under each group is tabulated in table 2

<b>Gestational Age</b>	<b>No. of Cases</b>
37	32
38	43
39	25
Total	100
Mean	37.93
SD	0.756

Common gestational age at delivery was found to be 38 completed weeks (43%)



DISTRIBUTION OF GESTATIONAL AGE



■ No. of Cases

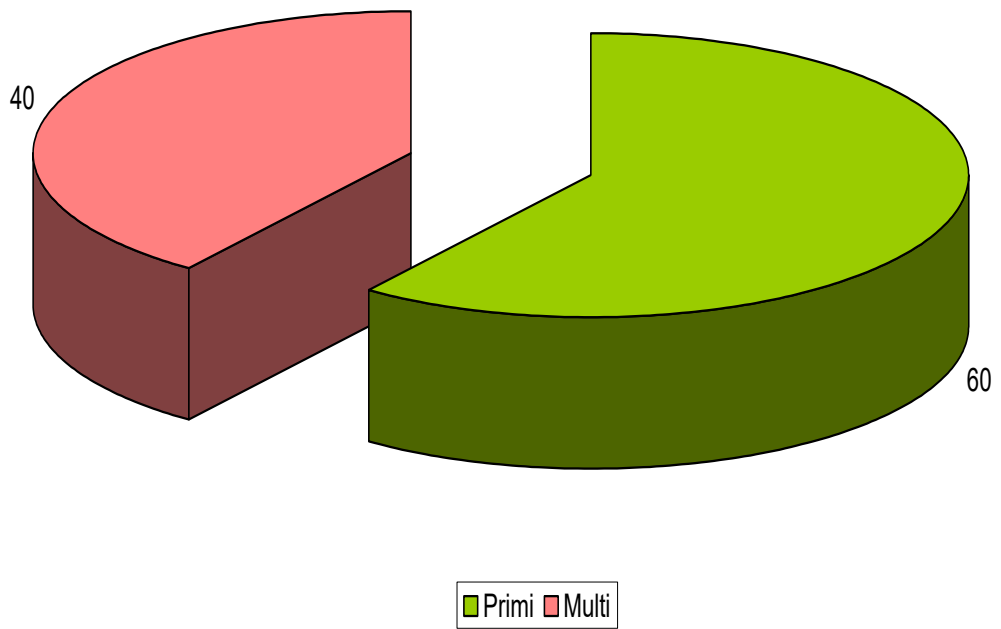
**TABLE – 3**

**DISTRIBUTION OF PARITY**

<b>Parity</b>	<b>No. of Cases</b>
Primi	60
Multi	40
Total	100

Of all cases taken up for second stage LSCS,60% of the cases were in the primi gravida and 40% of the cases multi gravida

PARITY DISTRIBUTION



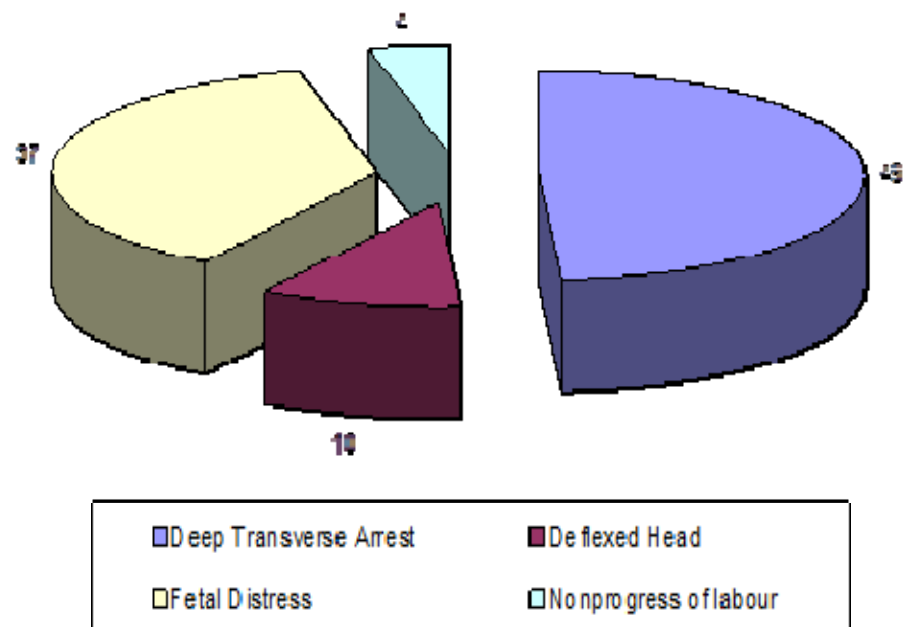
**TABLE – 4**

**DISTRIBUTION OF INDICATIONS OF SECOND STAGE LSCS**

In our study, most common indication for second stage LSCS was found to be deep transverse arrest(49) followed by fetal distress (37).

Indications	No. of Cases
Deep Transverse Arrest	49
Deflexed Head	10
Fetal Distress	37
Non progress of labor	4
Total	100

### INDICATIONS



## **MATERNAL COMPLICATIONS**

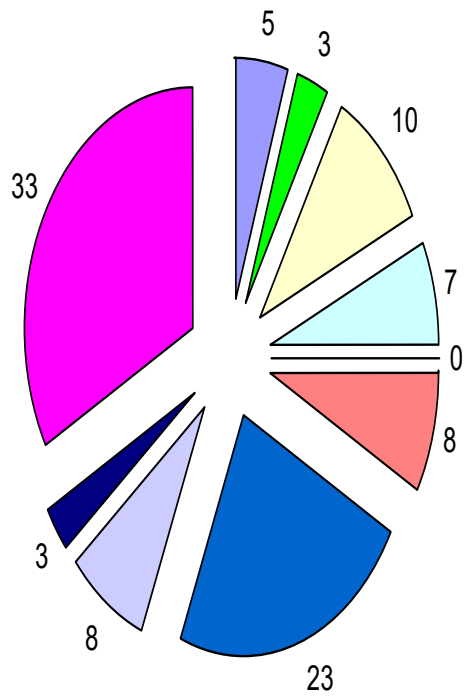
In our study maternal morbidity was observed in the form of PPH 31 cases. Of these 8 cases required compression suture and uterine artery ligation. Rest of the 23 cases were managed medically. Next most common was blood stained urine (10%) due to bladder congestion. Other maternal complications were LUS tear and angle extension (5%), ,bladder injury (3 %),febrile morbidity (7%), and wound sepsis (3%). Obstetric hysterectomy reported nil. The maternal complications are tabulated below

**TABLE – 5**

**DISTRIBUTION OF MATERNAL COMPLICATIONS**

Maternal Complications	No. of Cases
Angle Extension	5
Bladder Injury	3
Blood stained urine	10
Febrile morbidity	7
Hysterectomy	Nil
LUS Tear	8
PPH (medical management)	23
PPH (surgical management)	8
Wound sepsis	3
Nil	33
Total	100

### MATERNAL COMPLICATIONS



■ Angle Extension	■ Bladder Injury	■ Blood stained urine
■ Febrile morbidity	■ Hysterectomy	■ LUS Tear
■ PPH (medical management)	■ PPH (surgical management)	■ Wound sepsis
■ Nil		



## **FETAL MORBIDITY**

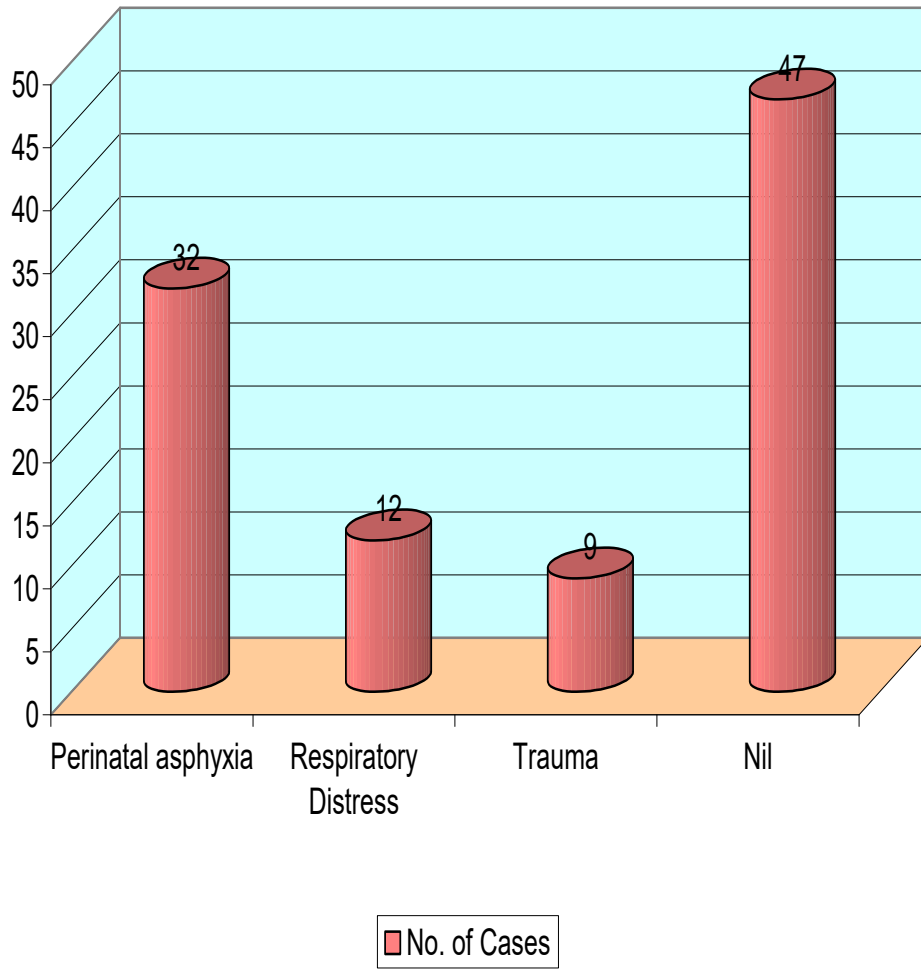
In our study, Perinatal asphyxia seen in 32 % cases, respiratory distress 12% and minor trauma in 9 % cases noted as tabulated below

**TABLE – 6**

### **DISTRIBUTION OF FETAL MORBIDITY**

<b>Fetal Morbidity</b>	<b>No. of Cases</b>
Perinatal asphyxia	32
Respiratory Distress	12
Trauma	9
Nil	47
Total	100

### FETAL MORBIDITY



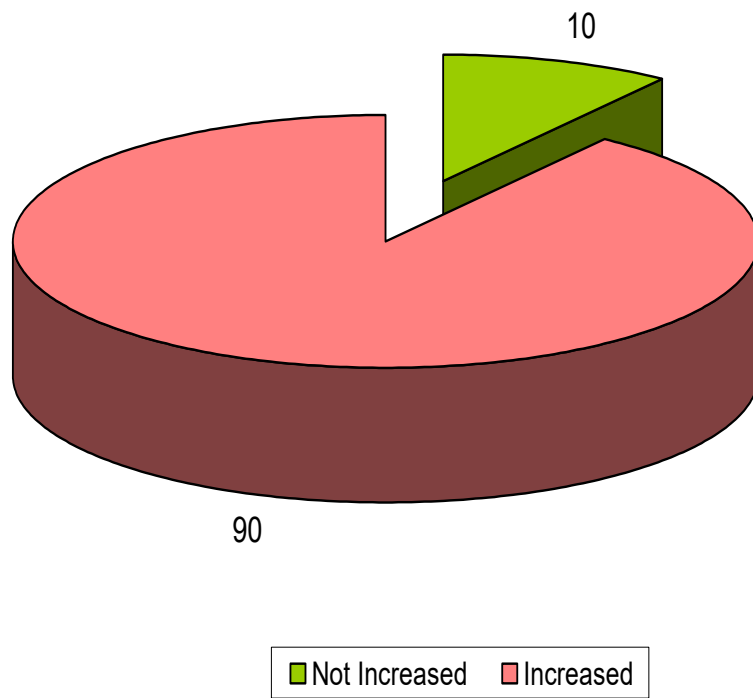
**TABLE – 7**

**DISTRIBUTION OF OPERATIVE TIME**

In majority of cases, increase in average operating time noted due to difficulty in baby delivery, extension of uterine incision and PPH.

<b>Operative Time</b>	<b>No. of Cases</b>
Increased	90
Not Increased	10
<b>Total</b>	<b>100</b>

# OPERATIVE TIME

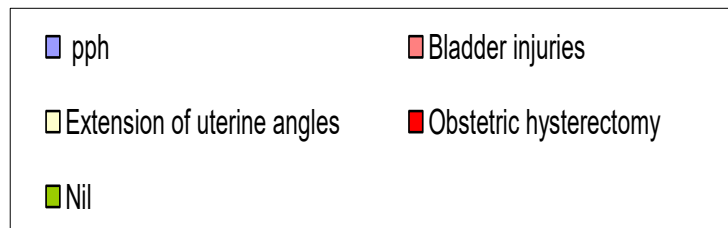
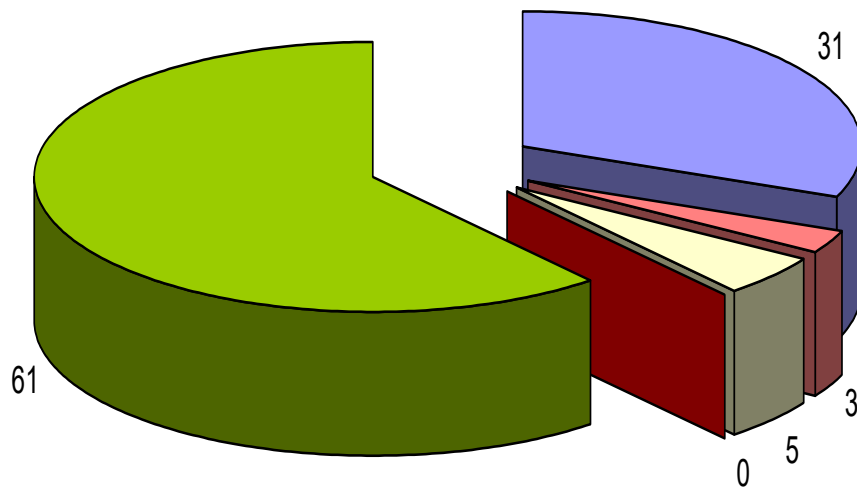


**TABLE – 8**

**DISTRIBUTION OF INTRA OPERATIVE COMPLICATIONS**

<b>Intra Operative Complications</b>	<b>No. of Cases</b>
PPH	31
Bladder injuries	3
Extension of uterine angles	5
Obstetric hysterectomy	Nil
Nil	61
Total	100

### INTRAOPERATIVE COMPLICATIONS



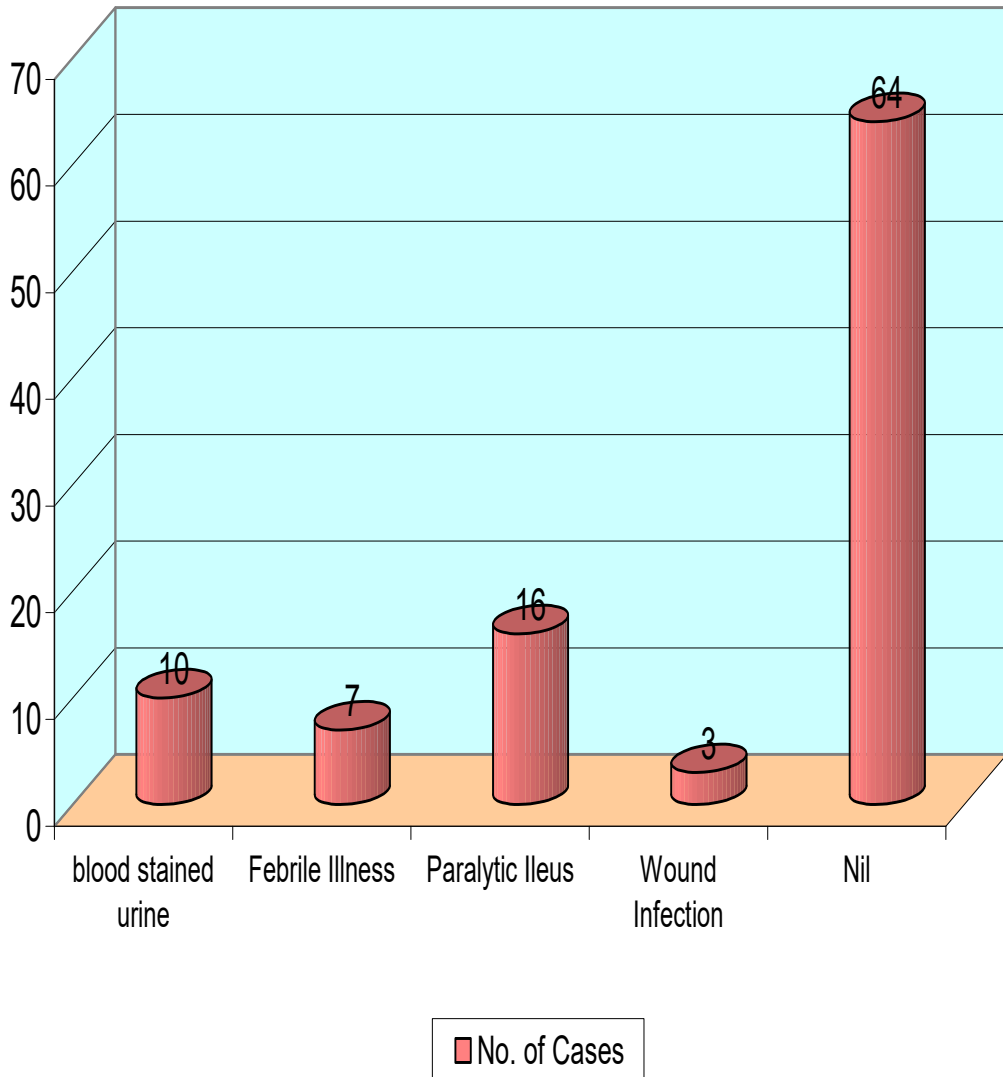
**TABLE – 9**

**DISTRIBUTION OF POST OPERATIVE COMPLICATIONS**

<b>Post Operative Complications</b>	<b>No. of Cases</b>
Blood stained urine	10
Febrile Illness	7
Paralytic Ileus	16
Wound Infection	3
Nil	54
Total	100

Paralytic ileus and blood stained urine were the common post operative complications, which settled within 24 hours.

## POST OPERATIVE COMPLICATIONS





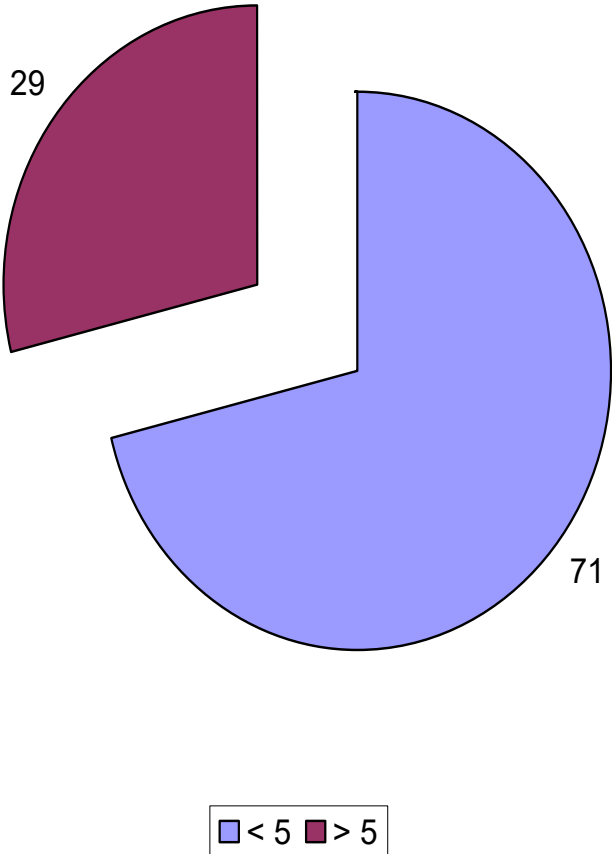
**TABLE – 10**

**DISTRIBUTION OF HOSPITAL STAY IN DAYS**

Increase in hospital stay post operatively > 5 days noted in 29 cases. The mean hospital stay found to be 5.45

<b>Hospital Stay in days</b>	<b>No. of Cases</b>
< 5	71
> 5	29
Total	100
Mean	5.45
SD	1.086

HOSPITAL STAY DISTRIBUTION



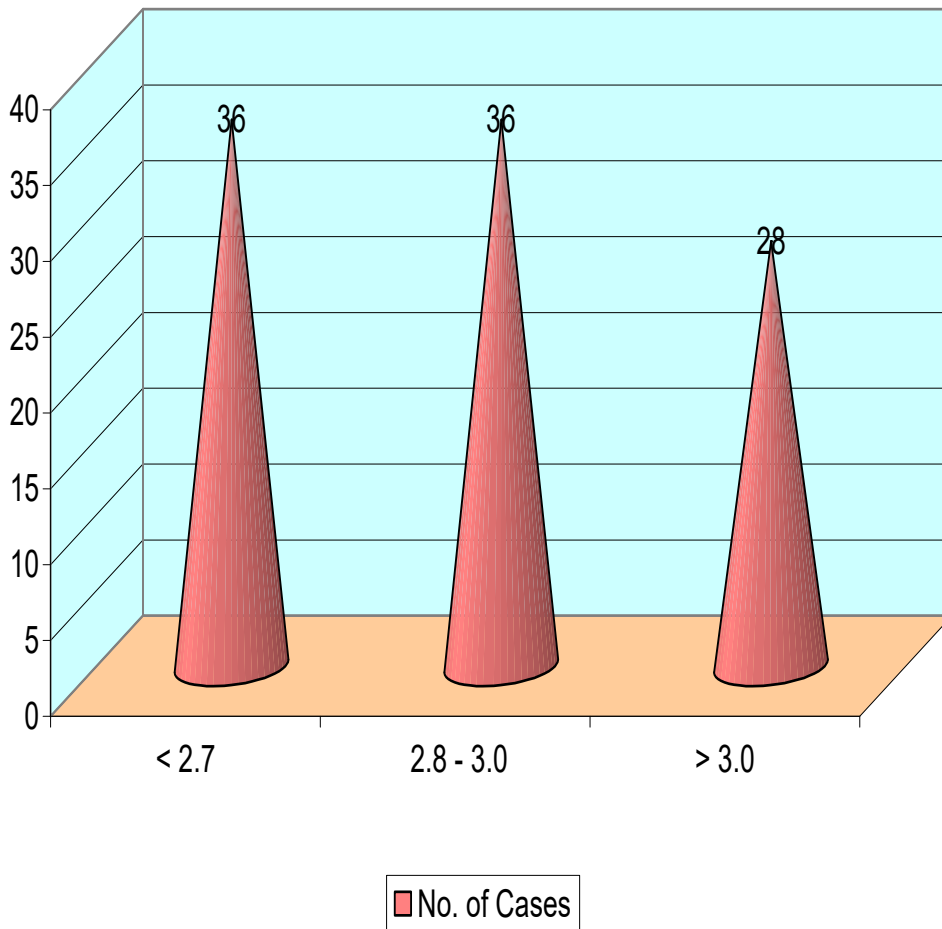
**TABLE – 11**

**DISTRIBUTION OF BIRTH WEIGHT IN KGS**

The mean birth weight of babies,taken up under the study was found to be 2.8 kg

<b>Birth weight in Kgs</b>	<b>No. of Cases</b>
< 2.7	36
2.8 - 3.0	36
> 3.0	28
Total	100
Mean	2.88
SD	0.265

# BIRTH WEIGHT DISTRIBUTION



# **DISCUSSION**

## DISCUSSION

This is a prospective observational study on 100 women with singleton low risk pregnancy, after 37 completed weeks of gestation admitted in Theni Medical College Hospital inclusive of referral cases between September 2020–september 2021 who went in for indicated second stage cesarean section and various maternal and perinatal outcomes studied.

In our study, deep transverse arrest was the most common indication (49 %) for cesarean section in second stage of labor followed by fetal distress (37 %). In the study conducted by Jonna Malathi et al, deep transverse arrest was the second most common indication (22%) for cesarean section in the second stage.

In our study, the mean age of these patients was 25 years. Among these 60 % were primigravida and 40 % were multigravida. In a study on frequency of second stage interventions and it's outcome in relation with instrumental vaginal delivery by Shahla Baloch et al. most of the women who need second stage intervention were among 21 to 30 years. Primigravida also contributed 45%. In the study by Malathi and Sunita, 61% women were in the age group of 21 to 30

years and primigravida contributed to 74%. The increased frequency of second stage cesareans in primigravidas could be cephalopelvic disproportion and rigid perineum.

Risks of both maternal and perinatal adverse outcomes rise with increased duration of the second stage, particularly for duration longer than 30minutes-2 hours. When intervened by cesarean section at this stage may lead to significant maternal complications like PPH, lower uterine segment tear, angle extension, bladder injury and post operative sepsis. There is significant relation of PPH with increased duration of second stage. Neonatal complications include low apgar, respiratory distress and NICU care >48 hours. Dan selo-ojeme et al studied that when compared with caesarean delivery in the first stage of labour, women undergoing cesarean delivery at full cervical dilatation were 4.6 times more likely to have composite intraoperative complications (95% CI 2.7–7.9,  $P < 0.001$ ), 3.1 times more likely to have blood loss greater than 1,000 ml (95% CI 1.3–7.4,  $P = 0.01$ ), and 2.9 times more likely to have a blood transfusion (95% CI 1.5–5.6,  $P < 0.001$ ). The risk of neonatal morbidity was higher in first stage caesareans when they were performed for presumed fetal compromise (66.3 vs. 26.3%,  $P = 0.002$ ), and lower when they were performed for failure to progress (18.4 vs. 42%,  $P = 0.02$

In our study maternal morbidity was observed in the form of PPH 31 cases. Of these 8 cases required surgical management i.e. B-Lynch sutures. Rest of the 23 cases were managed medically. Other maternal complications were LUS tear and angle extension (5%), blood stained urine (10%), bladder injury (3%), febrile morbidity (7%), and wound sepsis (3%). Obstetric hysterectomy reported nil. In the study by Malathi and Sunita, PPH was observed in 8%, out of these 2% were managed medically. Surgical management was done in 6% cases. Other maternal morbidities were also similar to our study. Similarly in the study by Shahla B8, PPH was present in 12.5%, wound infection in 8.33% and angle extension in 5.41% cases. Also in the study by Padma Gurung et al 2017 atonic post partum hemorrhage uterine incision extension 18 (12.5%), postoperative fever 27(18.8%), wound infection 7 (4.8%) were observed.

The cesarean section performed in second stage of labor was technically difficult because fetal head was engaged in the pelvis, uterine muscles were thin and tense, identification of the bladder and lower segment was difficult. Apart from these relatively large baby weight. Cesarean section in the second stage of labor took significantly longer duration in par with cebekulu et al 2006 study (median 45 vs. 30 min;  $P < 0.001$ ).



The mean birth weight among these babies was 2.8 kg. Perinatal asphyxia seen in 32 % cases, respiratory distress in 12 % and minor trauma in 9% which included cephalhematoma. There were controversies regarding the fetal outcome in the cases of cesarean sections in second stage of labor. Study by Ayhan Sucak, Asicioglu, Malati etc had proved adverse prognostic impact on fetal outcome. But many studies like Allen et al, Alexander, Selo-Ojeme etc. including the current study failed to demonstrate an increased fetal complications

In the study by Murphy et al 2001, delivery by CS at full dilatation has been shown to result in more admissions to NICU due to reduced Apgar score and umbilical artery pH compared with babies born by successful operative vaginal delivery. Babies born by CS at full dilatation are 1.5 times more likely to have perinatal asphyxia than those born by CS during the first stage of labour (11% of 549 deliveries versus 8% of 1074 deliveries; 95% CI 1.06–2.14,  $P < 0.05$ ). However, this is likely to be a result of increasing fetal compromise with prolonged duration of delivery, not a result of the procedure.

# **CONCLUSION**

## CONCLUSION

The incidence of second stage cesarean section is more in developing countries. Cesarean section in full cervical dilation is a critical situation associated with increased maternal and fetal morbidity. It can be avoided by early assessment and diagnosis of cephalopelvic disproportion in labor, assessment of position of fetal head by ultrasound and attendance of skilled health care provider during labor. Implementation of safe and effective instrumental delivery in skilled hands can also lead to a better feto maternal outcome. The focus should be on ensuring normal progress of labour, proper use of the partogram, oxytocin augmentation, if contractions are inadequate, avoidance of premature bearing down, alerting the neonatologist before hand, proper intrapartum fetal surveillance and timely decision for cesarean section especially when the expected fetal weight is more than 3 kg.

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## CONSENT FORM

**PATIENT NAME:**

**IP NO.:**

**STUDY TITLE: “A STUDY ON THE SECOND STAGE CESAREAN SECTION-MATERNAL AND FETAL OUTCOME”**

I agree to participate in the study entitled and have been informed about the details of the study in my own language.

I have completely understood the details of the study.

I am aware of the possible risks and benefits, while taking part in the study.

I understand that I can withdraw from the study at any point of time and even then, I can receive the medical treatment as usual.

I understand that I will not get any money for taking part in the study.

I will not object if the results of this study are getting published in any medical journal, provided my personal identity is not revealed.

I know what I am supposed to do by taking part in this study and I assure that I would extend my full cooperation for this study

Name of the participant :

Signature / Left thumb print:

Date :

Name of the investigator: Dr. R. Muthu Vadhana

Signature of investigator:

Date:

## ஆராய்ச்சி ஒப்புதல் படிவம்

ஆராய்ச்சியாளர்பெயர் : மருத்துவர்.

பங்கேற்பாளர்பெயர்:

பங்கேற்பாளர்எண் :

மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது .என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டது. நான் இவ்வாய்வில் தன்னிச்சையாகத் தான் பங்கேற்கிறேன் .எந்த காரணத்தினாலோ எந்த கட்டத்திலும் எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன்.

இந்த ஆய்வு சம்மந்தமாகவோ இதை சார்ந்த மேலும் ஆய்வு மேற்கொள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன் .நான் ஆய்வில் இருந்து விலகிகொண்டாலும் இது பொருந்தும் என அறிகிறேன்.

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பானதகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயப்படுத்திக்கொள்ளவும் அதை பிரசுரிக்கவும்என் முழுமனதுடன் சம்மதிக்கின்றேன்

இந்தஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன்.எனக்கு கொடுக்கப்பட்ட அறிவுரைகளின்படி நடந்துகொள்வதுடன் இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிக்கிறேன்.

ஆராய்ச்சியாளர் கையொப்பம்

பங்கேற்பாளர் கையொப்பம்

தேதி

## தகவல் நகல்

இந்த ஆராய்ச்சியில் உங்களிடம் கேட்கப்படும் கேள்விகளுக்கு உங்கள் முழுமனதுடன் பதிலளிக்கவேண்டும்.

இந்த ஆராய்ச்சியில் உங்களுக்கு எந்த பின்விளைவும் ஏற்படாது என்பதை நான் உறுதியளிக்கிறேன்.

உங்களுக்கு பணம் எதுவும் அளிக்கப்படாது என்பதை இதன் மூலம் தெரிவிக்கிறேன்.

இந்த ஆய்வில் உங்களுக்கு எந்த நேரடி பயன்எதுவும் இல்லை. நீங்கள் அளிக்கும் தகவல் மூலம் புதுயுக்திகள் வகுக்கப்படலாம்.

அதன் மூலம் வருங்காலத்தில் உங்களுக்கோ அல்லது உங்களை போன்ற மக்களுக்கு பயன்படலாம்.

நீங்கள் எப்போது வேண்டுமானாலும் இந்த ஆய்விலிருந்து விலகிக்கொள்ளலாம் .அதனால் உங்களின் விபரங்கள் எதுவும் தெரிவிக்கப்படாது என்பதை உறுதியளிக்கிறேன்.

இந்த ஆராய்ச்சியின் முடிவுகள் பத்திரிக்கைகளில் பிரசுரிக்கப்படலாம். ஆனால் உங்களின் அடையாளம் எதுவும் தெரிவிக்கப்படாது.



## PLAGIARISM CERTIFICATE

This is to certify that this dissertation work titled “**A STUDY ON THE SECOND STAGE CESAREAN SECTION-MATERNAL AND FETAL OUTCOME**” of the candidate **Dr. R. MUTHU VADHANA** with REG. NO. **221916656** for the award of M.S in the branch of OBSTETRICS AND GYNAECOLOGY. I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to conclusion pages and the result shows sixteen percentage of plagiarism in the dissertation (D 123719558).

Signature and Seal of the guide

**Dr. B.SHANTHIRANI MD., DGO.,**

Professor & Head of the Department,  
Department of O&G  
Govt. Theni Medical College & Hospital,  
Theni.

The following Project was approved by the Committee:

Name of the Project	Name and Designation	Remarks
A Study on the Second Stage – Cesarean Section – Maternal and Fetal Outcome	Dr. R. Muthu Vadhana II Year PG Dept. of Obs. & Gynaec.	Approved

Please note that the investigator should adhere the following: He/she should get a detailed informed consent from the Patients/participants and maintain Confidentially.

1. He/she should carry out the work without detrimental to regular activities as well as without extra expenditure to the institution.
2. He/she should inform the Institution Ethical Committee in case of any change of study procedure site and investigation or guide.
3. He/she should not deviate for the area of the work for which applied for Ethical Clearance. He/She should inform the Institution Ethical Committee immediately, in case of any adverse events or any serious adverse reactions.
4. He/she should abide to the rules and regulations of the institution.
5. He/she should complete the work within the specific period and apply for if any extension of time is required. He/she should apply for permission again and do the work.
6. He/she should submit the summary of the research work to the Ethical Committee on completion of the work.
7. He/she should not claim any funds from the institution while doing the work or on completion.
8. He/she should understand that the members of Institutional Ethical Committee have the right to monitor the work with prior intimation.
9. He/she should follow the existing Biomedical Wastes 2016 guidelines in samples collections, sample storage and sample disposals off.

  
Chairman

Dr. M. PALRAJ, M.D.,  
Civil Surgeon Retd.,  
RAMYA HOSPITAL  
574, Periyakulam Road,  
THENI - 625 531.

  
Convenor

DEAN  
19/3/21  
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THENI

To

The above individual – through the Head of the Department concerned.

## PROFORMA

Name / age/ OP/IP number :

Parity/ gestational age :

Co-morbidity :

Type of labor : spontaneous/ induced

Use of oxytocin :

ARM :

Epidural/ entonox :

Attempted instrumental delivery :

    Forceps / vaccum :

    Indication :

LSCS--- indication :

Station at the end of 1st stage of labor :

Duration of 2nd stage of labor :

Uterine inertia :

Inability to bear down :

CPD / contracted pelvis :

Malpresentation :

Big baby/ congenital anomaly :

PPH :

Blood transfusion :

Any other :

**Baby details** :

cried soon after birth :

Weight :

Apgar :

intubated at delivery room :

NICU admission >48 hrs :

Cord around the neck/ still birth/ NND

**Post operative Complications** :

Paralytic ileus :

Blood stained urine :

Others :



## Curiginal

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