"A COMPARATIVE STUDY OF NEONATAL OUT COME IN ELECTIVE LOWER SEGMENT CESAREAN SECTION, REPEAT LOWER SEGMENT CESAREAN SECTION AND VAGINAL BIRTH AFTER CESAREAN SECTION"

By

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IN

PEDIATRICS

Under the guidance of

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Dr. DEEPA KUNDARGI

ABSTRACT

Background:

There has been a significant increase in the incidence of elective LSCS world wide, significantly affecting the morbidity of neonates. The incidence of repeat elective LSCS is also increasing and incidence of VBAC is decrseing. Non-medically indicated (elective) childbirth before 39 weeks gestation carry significant risks for the baby with no known benefit to the mother. Neonates born by elective LSCS are to to have higher incidence of NICU admission due to respiratory distress syndrome to significant increase in neonatal morbidity. All the pregnant women who have undergone previous LSCS should be given a choice of repeat LSCS and VBAC if there are no contraindications. VBAC should be carefully monitored to prevent emergency LSCS. Neonates born by VBAC have lesser incidence of NICU admissions and lesser duration of hospital stay and lesser expenditure.

Objectives:

To evaluate the mortality and morbidity in neonates born by elective LSCS,repeat elective LSCS and VBAC

To record the interventions required in neonatal care in neonates born by elective LSCS, repeat elective LSCS, VBAC

To record the cost effectiveness of neonatal care of newborns delivered by elective LSCS, repeat elective LSCS and VBAC

Method of Statistical Analysis:

The following methods of statistical analysis have been used in this study. The Excel and SPSS (Ver 11.5,SPSS Inc, Chicago) software packages were used for data entry and analysis.The results were averaged (mean + standard deviation) for each parameter for continuous data and numbers and percentage for categorical data presented in Table and Figure.

1) Proportions were compared using Chi-square test of significance

Chi-Square (Chi^2) test for (r x c tables)

Rows	Columns			Total
	1	2…… …..	c	
1	a 1	a2	a c	t1
2	b 1	b2	b c	t2
.	.	…… …	.	.
.	.	…… …..	.	.
r	h 1	h2	h c	tr
Total	n 1	n2	n c	N

a,b…..h are the observed numbers.

N is the Grand Total

$$Chi^2 = N\left[\frac{1}{t_1}\sum_1^c \frac{a_1^2}{n_i} + \frac{1}{t_2}\sum_1^c \frac{b_1^2}{n_i} + \ldots\ldots\ldots\ldots + \frac{1}{t_r}\sum_1^c \frac{h_1^2}{n_i} - 1\right]$$

DF=(r-1)*(c-1), where r=rows and c=columns

DF= Degrees of Freedom (Number of observation that are free to vary after certain Restriction have been placed on the data)

2) One way Analysis of Variance (Anova)

One way analyses of variance were used to test the difference between groups. Analysis of Variance is a technique by which the total variation is split into two parts one between groups and the other within the groups. If 'F' value is significant there is a significant, difference between group means. To find out which of the two groups means is significantly difference post hoc test of Tukey test is used. In case of F value is not significant it indicates that there is no significant difference between the groups and stops the analysis at this stage and does not used Tukey test.

The formula used:

$$F = \frac{MS_{betweengroups}}{MS_{Withingroups}}$$ where MS=Mean Sum of Square

In all the above test a "p" value of less than 0.05 was accepted as indicating statistical significance

RESULTS

- Total 66 cases were included in this study.
- 27.3% of neonates where born by elective LSCS, 40.9% neonates by repeat elective LSCS and 31.8% neonates by VBAC
- Most common indication for elective LSCS was maternal desire.
- P value was significant in APGAR values in all 3 groups.
- Mean birth weight in repeat elective LSCS was 3.01kgs, in elective LSCS group it was 2.86kgs, and VBAC it was 2.64kgs.
- Respiratory distress was the most common indication of NICU admission in neonates born by elective LSCS.
- Total expenditure for neonatal care in VABC group was significantly less.

CONCLUSION

Repeat elective LSCS was the most common mode of delivery practiced following elective LSCS. Indication for more than 90% of cases of repeat elective LSCS was previous LSCS followed by maternal desire. The mean birth weight was lowest in VBAC group. Respiratory distress was the most common indication admission of NICU in neonates born by elective and repeat elective LSCS. Low APGAR, sepsis, hypoglycemia had higher incidence in VBAC group. VBAC group had a very low expenditure compared to other 2 groups.

Key words - Elective LSCS, repeat elective LSCS, VBAC, respiratory distress

ABBREVATIONS

LSCS	Lower segment cesarean section
VBAC	Vaginal birth after cesarean
RDS	Respiratory distress syndrome
TTN	Transient tachypnea of new born
NICU	Neonatal intensive care unit
MSAF	Meconium stained amniotic fluid
MAS	Meconium aspiration syndrome
TLC	Thin layer chromatography
FSI	Foam stability index
GBS	Group B streptococci
PPHN	Persistant pulmonary hypertension
RHD	Rheumatic heart disease
CPD	Cephalo pelvic disproportion
LBW	Low birth weight
BA	Birth asphyxia
Kg	kilogram
WHO	World health organisation

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INTRODUCTION

A healthy mother and healthy baby both physically and psychologically is the moto whether obstetricians wish to avoid or conduct interventions for any mode of delivery.[1] Interventions with inevitable harm have to be justified by doctors.1 Cesarean section is an operative procedure where by the fetus after the end of 28th week of gestation is delivered through an incision over the abdominal and uterine wall2. Recently trend of rise in ECD due to maternal request has been noted. Non-medically indicated (elective) childbirth before 39 weeks gestation carry significant risks for the baby with no known benefit to the mother.[2]

Incidence of LSCS in different parts of world in 2007 is 46% in China, 25% and above in many Asian, European and Latin American countries. Across Europe, there are significant differences between countries: in Italy the Caesarean section rate is 40%, while in the Nordic countries it is only 14%.[3]

Infants delivered by elective cesarean section are reported to have an increased risk of pulmonary disorder, often requiring Neonatal Intensive Care (NICU) admission.[4] Newborn mortality of neonates delivered at 37 weeks may be 2.5 times more than that of delivery at 40 weeks, and was also elevated compared to birth at 38 weeks of gestation. These “early term” births were also associated with increased death during infancy, compared to those births occurring at 39 to 41 weeks ("full term").[4]

In the case of cesarean sections, rates of respiratory death in newborns were 14 times higher in births at 37 weeks and 8.2 times higher for births at 38 weeks as compared with 40 weeks gestation births by pre-labour cesarean sections.[2] When all is normal with the mother c/section has a eight fold higher mortality, 8-12 times higher morbidity and a higher incidence of complication than vaginal delivery.5 Other risks

include: retention of fluid in the lungs can occur if not expelled by the pressure of contractions during labour leading to respiratory distress.[3,5] Higher infant mortality risk: In C-sections performed with no indicated risk (singleton at full term in a head-down position), the risk of death in the first 28 days of life has been cited as 1.77 per 1,000 live births among women who had C-sections, compared to 0.62 per 1,000 for women who delivered vaginally.[4,6] Cost effectiveness, maternal psychological satisfaction and shorter hospital stay in vaginal birth compared to repeat c/section is observed.6 The study by Grobman et al. used a variety of literature sources and estimated a cost of $2.4 million (M) to prevent one major neonatal adverse outcome by performing cesarean section instead of trial of labour[7] This means that 1,591 cesarean sections would be performed resulting in 0.1 additional maternal deaths and 74 additional maternal morbid events to prevent one serious neonatal outcome.[8]

The above facts tell that there has been a significant increase in incidence of LSCS leading to an increased morbidity, mortality and increased expenditure in neonates born by LSCS.[9] There is lack of significant data in our country regarding neonatal outcomes of birth by ECD v/s repeat ECD v/s VBAC hence there is requirement for such a study.[10]

Cesarean section is an operative procedure where by the fetus after the end of 28th week of gestation is delivered through an incision on the abdominal and uterine wall.1,11 Recently there has been rise in ECD due to maternal request. Non-medically indicated (elective) childbirth before 39 weeks gestation carry significant risks for the baby with no known benefit to the mother.11 Incidence of LSCS in different parts of world in 2007 is 46% in China and to levels of 25% and above in many Asian, European and Latin American countries. In 2007, in the United States, the Caesarean

section rate was 31.8%.12Across Europe, there are significant differences between countries: in Italy the Caesarean section rate is 40%, while in the Nordic countries it is only 14%.[3,12]

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OBJECTIVES OF STUDY

1. To evaluate the mortality and morbidity in neonates born by elective LSCS,repeat elective LSCS and VBAC

2. To record the interventions required in neonatal care in neonates born by elective LSCS, repeat elective LSCS, VBAC

3. To record the cost effectiveness of neonatal care of newborns delivered by elective LSCS, repeat elective LSCS and VBAC

REVIEW OF LITERATURE :

"Knowledge is an awareness or perception of reality acquired, through learning or investigation".

A normal vaginal delivery helps a neonate to overcome following resistance for the expansion of the lungs.

1. Viscosity of lung fluid
2. Lung tissue resistance
3. The forces of surface tension at the air-liquid interface.[6,16]

During delivery of the chest, intrathoracic pressure increases up to 200cm of H2O due to vaginal squeeze. Following delivery of the head about 5-30 ml of tracheal fluid is squeezed out. With the delivery of the thorax, the elastic recoil of the chest initiates the passive inspiration. Diaphragmatic contraction and the chest wall expansion create a negative intrathoracic pressure.[6,16]

The first breath (short inspiration followed by long expiration) establishes a functional residual capacity (16-20 ml)and brings about a huge increase in pulmonary perfusion and subsequent normal pattern of breathing. A negative intrathoracic pressure of 15cm water is needed to establish regular respiration. This also is sufficient to overcome the surface tension of 20 dynes per cm2 at the fluid interface of alveolar epithelium and is helped immensely by pulmonary surfactant which diminishes it to 4dynes per cm^2 .[6,16]

IMPORTANT FACTORS THAT OPERATE TO OVERCOME THE LUNG RESISTANCE.[6,16]

1. Increased fluid absorption and less fluid secretion by the alveolar cells with the onset of labour
2. Thoracic squeeze during delivery
3. Marked increase in pulmonary lymph flow
4. Removal of fluid via pulmonary circulation.[16]

In a normal birth the process is completed within 2 hrs. Babies born by caesarean and premature infants have delayed lung fluid absorption.

The high rate of TTN in neonates born by LSCS is due to absence of hormonal changes that accompany spontaneous labor; this risk is further increased by preterm birth.[2] Other risk factors that have adverse impact are male gender, family history of asthma which is related to altered sensitivity to catecholamines that play a role in lung field clearance. Macrosomia, maternal diabetes and multiple gestation also have increased risk.[17]

Cesarean delivery is one of the oldest operation in surgery with its origin lost in the midst of antiquity and mythology. Ancient myth and legend has it that Aescuralapius and Bacchus, the gods of medicine and wine respectively were born by cesarean section. [17]

The origin of the word ‘cesarean’ is unclear. The weak myth that Julius Caesar was born by this mode is contradicted by the fact that his mother survived for many

years after his birth. The term comes from the Lex Regia or legal law legislated by one of the early kings of Rome, Numaparupilius in 715 BC.[8,18] This law proclaimed that the women who died before delivering their infant had to have the infant removed through abdomen before burial. This law continued under the rule of Caesaer when it was called 'Lex Caesarea'.[8,18]

Traumatic cesarean section have probably occurred through out the history during waes as the act of violence and accidents. In northern Ireland in 1738 Mary Donnally, an illiterate but experienced lay midwife carried out the first cesarean with survival of the mother in Birtish Isles.[8,18]

The first witnessed and documented cesarean section by a physician was performed by jeremias trautruann in wittenberg, Germany in 1610. The reasons for high mortality in the pre anesthetic era were that cesarean section were usually performed after prolonged labour.[9,18]

CLINICAL GUIDELINE FOR VAGINAL BIRTH AFTER CAESAREAN SECTION (VBAC)

The Guidance.[19]

1. **Patient Suitability for VBAC**

- Women who have had one uncomplicated lower section caesarean section (LSCS), and have an otherwise uncomplicated pregnancy should be encouraged to attempt a VBAC. The success rate is between 72 to 76 % if the woman has never had a vaginal birth and 87 to 90% if she has.

- VBAC may also be suitable for other women after consideration and discussion of the risk.
- The success rate for women who have had a previous vaginal birth and who had a LSCS for fetal reasons is extremely good and these women in particular should be encouraged and supported to attempt a VBAC.[19]
- Women admitted in preterm labour with a history of previous LSCS have a similar success rate to those who labour at term but a lower risk of uterine rupture and therefore should be encouraged to reconsider a VBAC even though they may have originally requested an elective LSCS.[19]

2. <u>Situations in which further discussion with a consultant is needed</u>:

- Women with a complicated pregnancy or difficulties at previous CS.
- Two caesarean sections.
- Women requiring induction of labour.

3. <u>Contraindications.[19]</u>

- Previous uterine rupture.
- Previous classical caesarean section.
- 3 + previous CS (relative contraindication as reliable estimates of risk of rupture unknown).

4. Antenatal Counselling and Management

- A VBAC Information Sheet should be given to the woman by the community midwife at the time of booking and this should be documented in the woman's hand held notes. The woman should be encouraged to read this prior to attending the consultant clinic.

- The woman should be seen in the consultant before 36 weeks gestation.
- At the clinic suitability for VBAC should be considered. If there are any concerns regarding the suitability this should be discussed with the consultant.

5. Risks of VBAC should be discussed with the woman and include:-

- 0.5 % risk of uterine rupture, which can be associated with significant maternal and perinatal morbidity/mortality.
- 2-3/10,000 increased risk of perinatal mortality which is no different to the risk for women having their first birth but higher than that with elective LSCS.
- <1 in 1000 risk of neonate developing hypoxic ischemic encephalopathy (which has variable outcomes).
- 1% additional risk haemorrhage requiring a blood transfusion.

6. Benefits of VBAC should also be discussed and should include:-

i. Reduces the risk of neonate having respiratory problems such as transient tachypnoea or respiratory distress syndrome after birth – risk is 2-3% with VBAC and 3-4% with elective LSCS.

ii. Further caesarean increases risks in future pregnancies e.g. placenta praevia and accreta and hence caesarean hysterectomy, complications of adhesions during surgery and bladder and bowel trauma.

iii. Quicker recovery period. Able to return to normal activities such as lifting and driving sooner than with a CS.

iv. Potential of avoiding major surgery and the associated complications.

v. The antenatal counselling should be documented using the Discussion Form . The woman should be asked to sign it and it should be filed in the woman's hand held notes.

vi. A plan in the event of labour starting prior to the scheduled CS date should be discussed with the woman and documented on the Discussion Form.

vii. A plan should labour not commence spontaneously by term +12 should be discussed with the woman and documented on the Discussion Form. Women should be informed that if they are admitted in preterm labour the success rate of VBAC is similar to that at term however there is a lower risk of uterine rupture.

viii. An overall success rate for planned VBAC of 72-76% should be given (87 -90% if previous vaginal birth). This will be influenced by the risk factors for unsuccessful VBAC.

Respiratory Distress in the Newborn.[11,20]

Respiratory difficulties constitute the commonest cause of morbidity in newborn neonates and pulmonary pathology is the most frequent autopsy finding in the neonates.[12,20]

Definition- Respiratory Distress is diagnosed clinically by the presence of at least two of the following criteria namely, respiratory rate of greater 60 / minute, retractions (subcostal, xiphoid and suprasternal recession), flaring of the alaenasi, expiratory grunt and cyanosis at room air on two consecutive examinations at least one hour apart.[21]

Respiratory distress is a symptom complex secondary to a large number of etiological factors. The respiratory causes like Meconium Aspiration Syndrome, Pneumonia, and Hyaline Membrane disease. Less common respiratory causes like pulmonary hemorrhage and pulmonary air leak. Rare causes like lung cyst, Tracheo-esophageal fistula. Extra pulmonary causes like patent ductus arteriosus, acute blood loss, hypoglycemia & asphyxia.[11,14] Respiratory distress incidence may vary from 7-

8% among live birth. The incidence is 30% among preterm's, 20% among post term, 4% among term babies.[15,22]

The most common etiology of neonatal respiratory distress is transient tachypnea of the newborn; this is triggered by excessive lung fluid, and symptoms usually resolve spontaneously.[16,22] Respiratory distress syndrome can occur in premature infants as a result of surfactant deficiency and underdeveloped lung anatomy. Intervention with oxygenation, ventilation, and surfactant replacement is often necessary. Prenatal administration of corticosteroids between 24 and 34 weeks' gestation reduces the risk of respiratory distress syndrome of the newborn when the risk of preterm delivery is high.[17,22] Meconium aspiration syndrome is thought to occur in utero as a result of fetal distress by hypoxia. The incidence is not reduced by use of amnio-infusion before delivery nor by suctioning of the infant during delivery. Treatment options are resuscitation, oxygenation, surfactant replacement, and ventilation. Other etiologies of respiratory distress include pneumonia, sepsis, pneumothorax, persistent pulmonary hypertension, and congenital malformations; treatment is disease specific. Initial evaluation for persistent or severe respiratory distress may include complete blood count with differential, chest radiography, and pulse oximetry.[18,23]

The clinical presentation of respiratory distress in the newborn includes apnea, cyanosis, grunting, inspiratory stridor, nasal flaring, poor feeding, and tachypnea (more than 60 breaths per minute).[19,23]

There may also be retractions in the intercostal, subcostal, or supracostal spaces. Respiratory distress occurs in approximately 7 percent of infants, and preparation is crucial for physicians providing neonatal care. Most cases are caused

by transient tachypnea of the newborn, respiratory distress syndrome, or meconium aspiration syndrome, but various other causes are possible.[20,23]

Differential Diagnosis of Respiratory Distress in the Newborn.[24]

Most common causes*

Transient tachypnea of the newborn

Respiratory distress syndrome (hyaline membrane disease)

Meconium aspiration syndrome

Less common but significant causes

Delayed transition

Infection (e.g., pneumonia, sepsis)

Nonpulmonary causes (e.g., anemia, congenital heart disease, congenital malfor medications, neurologic or metabolic abnormalities, polycythemia, upper airway obstructi

Persistent pulmonary hypertension of the newborn

Pneumothorax

*—*Listed in order of incidence*.

LIMITATIONS IN NEWBORN CHEST.[25]

- Cylindrical rib cage and ribs run parallel to horizontal plane.
- Short intercostal and accessory muscles hence less mechanical advantage for lifting up the ribs to increase the intrathoracic volume on forceful inspiration.[25]
- The angle of insertion of newborn diaphragm is more horizontal then adults hence it moves more inwards then upwards during respiratory contraction.

- The soft pliable ribs present little resistance to inward movement.
- Newborns more so preterms have low muscle mass.
- Respiratory muscle fatigue is hence common, the average force generated by muscle mass is inversely proportional to the number of contractions that it effects per unit time.[25]

Transient Tachypnea of the Newborn.[26,27]

Transient tachypnea of the newborn is the most common cause of neonatal respiratory distress, constituting more than 40 percent of cases.[28,29] A benign condition, it occurs when residual pulmonary fluid remains in fetal lung tissue after delivery. Transient tachypnoea of the newborn (TTN)**,** also known as retained fetal fluid or wet lung disease**,** presents in the neonate as tachypnoea for the first few hours of life, lasting up to one day[30].

The tachypnea usually resolves by two days. Prostaglandins released after delivery dilate lymphatic vessels to remove lung fluid as pulmonary circulation increases with the first breath. When fluid persists despite these mechanisms, transient tachypnea of the newborn can result.[31] Neonates with TTN have inefficient transition from in utero to ex utero pulmonary function due to delayed ion channel switching in the pulmonary epithelium. The absence of mechanical forces that normally aid pulmonary fluid clearance also may contribute to TTN in neonates delivered by cesarean section. With no specific or effective therapies, oxygen treatment and time are generally sufficient for resolution. However, TTN is now more frequent in the neonatal intensive care units because of increased cesarean delivery rates. Some

infants have “severe” TTN requiring ventilation support. Although diuretics have been tried for TTN without much success.[32]

Pathology.[33]

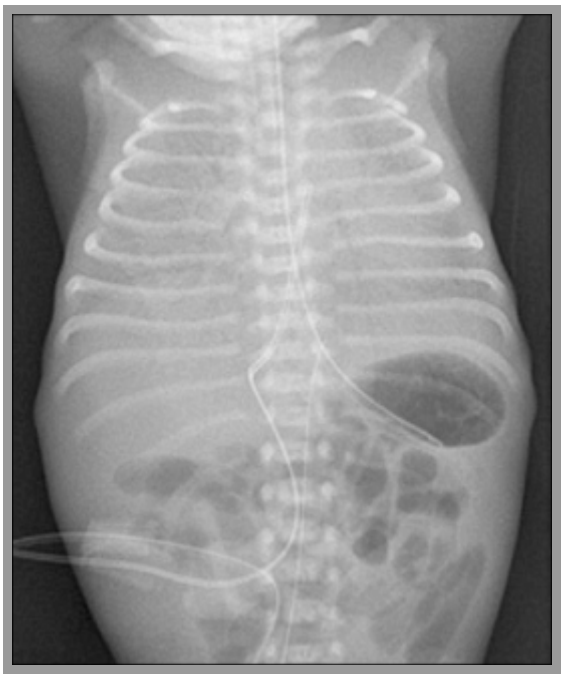
- Amniotic fluid is expressed from the lungs during vaginal delivery and absorbed after birth.
- Occurs due to the buildup of fluid in the lungs due to probable reduced mechanical squeeze and reduced capillary and lymphatic remove.
- This is more common with Caesarean section deliveries presumably due to lack of thoracic compression as with a vaginal delivery, which in turn causes reduced clearance of fluid from the lungs.
- There is a higher incidence of TTN in babies born by Caesarean section.[33]

TTN results in significant social and financial burden as affected neonates require admission to the neonatal intensive care unit (NICU). Separation from parents and clinical illness delay parent–child bonding and initiation of breast-feeding. These costs, although individually minor, are increasingly important with the recent sharp rise in birth rate of late preterm neonates and those delivered by cesarean section,the groups at greatest risk for TTN.[16,34] No effective treatment for TTN beyond supportive care has yet been identified. A modest reduction in TTN symptom duration in a subset of patients with TTN could translate into savings of thousands of hospital days and millions of dollars.[34]

Proposed classification system for patients with TTN.[35]

Classification	Patient description
Uncomplicated	No air leak (pneumothorax or pneumomediastinum)
Complicated	Air leak present on chest X-ray
Mild	No respiratory support (CPAP, HFNCPAP, or NC) required
Moderate	Respiratory support required for <48 hours
Severe	Respiratory support required for ≥48 hours

RESPIRATORY DISTRESS SYNDROME



Respiratory distress syndrome of the newborn, also called hyaline membrane disease, is the most common cause of respiratory distress in premature infants, correlating with structural and functional lung immaturity. It is most common in

infants born at fewer than 28 weeks' gestation and affects one third of infants born at 28 to 34 weeks' gestation, but occurs in less than 5 percent of those born after 34 weeks' gestation. The condition is more common in boys, and the incidence is approximately six times higher in infants whose mothers have diabetes, because of delayed pulmonary maturity despite macrosomia.[36]

The pathophysiology is complex. Immature type II alveolar cells produce less surfactant, causing an increase in alveolar surface tension and a decrease in compliance. The resultant atelectasis causes pulmonary vascular constriction, hypoperfusion, and lung tissue ischemia. Hyaline membranes form through the combination of sloughed epithelium, protein, and edema. Persistent respiratory distress syndrome leads to bronchopulmonary dysplasia, characterized by typical chest radiography findings and chronic oxygen dependence. The syndrome is associated with recurrent wheezing in children and a higher risk of hospital admission for asthma.[36]

The diagnosis of respiratory distress syndrome should be suspected when grunting, retractions, or other typical distress symptoms occur in a premature infant immediately after birth. Hypoxia and cyanosis often occur. Chest radiography shows homogenous opaque infiltrates and air bronchograms, indicating contrast in airless lung tissue seen against air-filled bronchi, decreased lung volumes also can be detected.[37]

Predicting risk of HMD

- **LECITHIN/SPHINGOMYELIN (L/S) RATIO TEST**

The lecithin/sphingomyelin (L/S) ratio test is a test to evaluate fetal lung maturity. Surfactant is composed of lipids, proteins, and carbohydrates. Most of the lipids are phospholipids including lecithin (L) and sphingomyelin (S). During early pregnancy, lecithin and sphingomyelin make up about 20% and 50%, respectively, of total fetal surfactant lipids. While sphingomyelin remains relatively constant throughout the pregnancy, lecithin levels dramatically increase with lung maturity. There is a sharp increase in lecithin levels after 32-33 weeks gestation. In the mature lung, lecithin comprises about 70% of the total surfactant lipids. Thus, as the lungs matures, the ratio of lecithin to sphingomyelin increases.[11,38]

Interpretation of L/S Ratio

L/S ratio values, as related to fetal lung maturity, are divided into three categories: immature, transitional, and mature. A L/S ratio of $\leq$ 1.5 indicates that the lungs are immature. The fetus is not producing enough surfactant. Infants delivered with a L/S ratio $\leq$ 1.5 have a high risk of respiratory distress syndrome. A L/S ratio between 1.5 and 1.9 indicates a transitional situation. The lungs are on the threshold of maturity. Lung maturity is expected within 2 weeks. A L/S ratio of 2 is the commonly accepted standard value indicating lung maturity in the fetus. Infants delivered after attaining an L/S ratio of 2.0 or higher rarely develop RDS.[38,39]

How to Perform the L/S Ratio Test.[40]

Although there are many lecithin-based fetal lung maturity tests; thin-layer chormotography (TLC) is widely used in laboratories to determine the L/S ratio. It is a labor intensive test that takes 3 -5 hours to perform.

A sample of amniotic fluid is collected by a procedure called amniocentesis. The lipids, including lecithin and sphingomyelin are extracted from the amniotic fluid with a chloroform-methanol mixture. Then the extracted lipids are applied to the channels of a TLC plate. The separation occurs in a solvent system of chloroform, methanol, triethylamine, 2-propanol and water. In this process the lecithin and sphingomyelin bands are well separated from other phospholipids. The phospholipids on the TLC plate are made visible by the process of charring using phosphoric acid with a cupric acetate catalyst.

The intensity of the lecithin and sphingomyelin bands are quantitated using a densitometer and expressed as a ratio. The consistent concentration of sphingomyelin provides a good baseline against which the amount of lecithin can be compared.

Causes of Erroneous Results.[40,41]

Diabetes mellitus can result in a falsely elevated L/S ratio. The result will suggests the lung is more mature then it really is.

Meconium is fetal waste inside the amniotic fluid. Meconium will make amniotic fluid samples appear yellow/green. Meconium in the sample can result in a falsely decreased L/S ratio. The result will suggest the lung is less mature then it really is.[41]

Blood contains phospholipids including lecithin and sphingomyelin. Thus, contamination of amniotic fluid with blood will affect the L/S ratio. Contaminating

blood can increase low amniotic fluid L/S ratios and lower high amniotic fluid L/S ratios. The degree of change is dependant on the level of contamination.[42]

SHAKE TEST.[43]

The shake test is a qualitative measurement of the amount of pulmonary surfactant contained in the amniotic fluid. It is quick and inexpensive. It is a bedside test of lung maturity. In an obstetric emergency, an immediate decision about delivery can be made. The advantages of this test over the others are that a physician, technician or must can perform it and the test are highly reliable.

- It evaluates the ability of pulmonary surfactant to generate a stable foam in the presence of ethanol.
- Ethanol, a nonfoaming competitive surfactant, eliminates the contributions of protein, bile salts, and salts of free fatty acids to the formation of a stable foam.
- At an ethanol concentration of 47.5 percent, stable bubbles that form after shaking are due to amniotic fluid lecithin.[23,24]
- Positive tests, a complete ring of bubbles at the meniscus with a 1:2 dilution of amniotic fluid, are rarely associated with neonatal RDS.[43]

  It is a screening test that gives useful information if mature.

Function:

Foam Stability Index.[43,44]

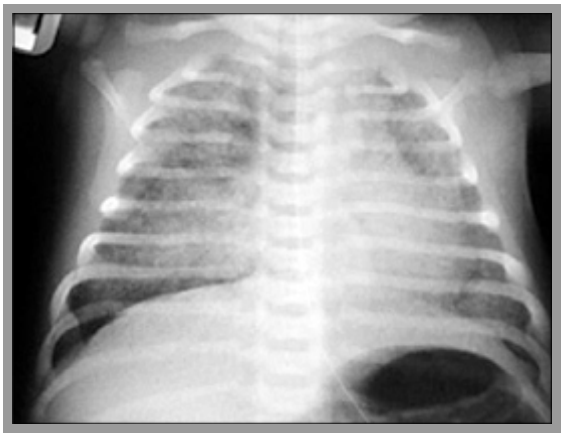
- The test is based on the manual foam stability index (FSI), a variation of the shake test.
- The kit currently available contains test wells with a predispensed volume of ethanol. The addition of 0.5-ml amniotic fluid to each test well in the kit produces

final ethanol volumes of 44 to 50 percent. A control well contains sufficient surfactant in 50 percent ethanol to produce an example of the stable foam end point.

- The amniotic fluid:ethanol mixture is first shaken, and the FSI value is read as the highest value well in which a ring of stable foam persists.
- This test appears to be a reliable predictor of fetal lung maturity.
- Subsequent RDS is very unlikely with an FSI value of 47 or higher.
- The methodology is simple, and the test can be performed at any time of day by persons who have had only minimal instruction.
- The assay appears to be extremely sensitive, with a high proportion of immature results being associated with RDS, as well as moderately specific, with a high proportion of mature results predicting the absence of RDS.
- Contamination of the amniotic fluid specimen by blood or meconium invalidates the FSI results. The FSI can function well as a screening test.[44]

MECONIUM ASPIRATION SYNDROME.[45]

Meconium consists of bile, intestinal secretion, amniotic fluids and exfoliated epithelial cells. About 10-12% of fetus may pass meconium before delivery. Only 25% of meconium aspiration will result in meconium aspiration syndrome. MAS mortality may vary from 15 – 20%.Although sterile, meconium is locally irritative, obstructive, and a medium for bacterial culture. Meconium passage may represent hypoxia or fetal distress in utero. Similar symptoms can occur after aspiration of blood or nonstained amniotic fluid.Meconium aspiration syndrome causes significant respiratory distress immediately after delivery. Hypoxia occurs because aspiration takes place in utero. Chest radiography shows patchy atelectasis or consolidation.[45]



Chest radiography shows patchy atelectasis or consolidation

INFECTION

Bacterial infection is another possible cause of neonatal respiratory distress. Common pathogens include group B streptococci (GBS), *Staphylococcus aureus, Streptococcus pneumoniae*, and gram-negative enteric rods. Pneumonia and sepsis have various manifestations, including the typical signs of distress as well as temperature instability. Unlike transient tachypnea, respiratory distress syndrome, and meconium aspiration syndrome, bacterial infection takes time to develop, with respiratory consequences occurring hours to days after birth. Pneumonia is observerd in 0.5% of all live births , infection could be acquired before , after or during delivery. Transplacental infection are usually caused by cytomegalovirus, rubella, lysteria ,Treponima pallidum.[46]

Risk factors for pneumonia include prolonged rupture of membranes, prematurity, and maternal fever. Prevention of GBS infection through universal screening and antepartum treatment reduces rates of early-onset disease, including pneumonia and sepsis, by 80 percent.[21,47]

Chest radiography helps in the diagnosis, with bilateral infiltrates suggesting in utero infection. Pleural effusions are present in two thirds of cases. Serial blood cultures may be obtained to later identify an infecting organism.[21,47]

PNEUMOTHORAX

Pneumothorax, defined as air in the pleural space, can be a cause of neonatal respiratory distress when pressure within the pulmonary space exceeds extrapleural pressure. It can occur spontaneously or as a result of infection, meconium aspiration, lung deformity, or ventilation barotrauma. The incidence of spontaneous pneumothorax is 1 to 2 percent in term births, but it increases to about 6 percent in premature births. Diagnosis of pneumothorax is difficult due to absence of classical signs in neonates.[48]

The following signs are helpful.

1. Sudden unexpected collapse.
2. Rapidly increasing oxygen demand.
3. Little breath sounds with reduced cheast movements on affected side.
4. Easily palpable liver in right sided pneumothorax.
5. Dull cardiac sounds in left sided pneumothorax.[49]

CLINICAL ASSESSMENT OF NEWBORN WITH RESPIRATORY DISTRESS

Frequently maternal history gives important clues of cause of respiratory distress, that is antenatal, natal and resuscitation history.

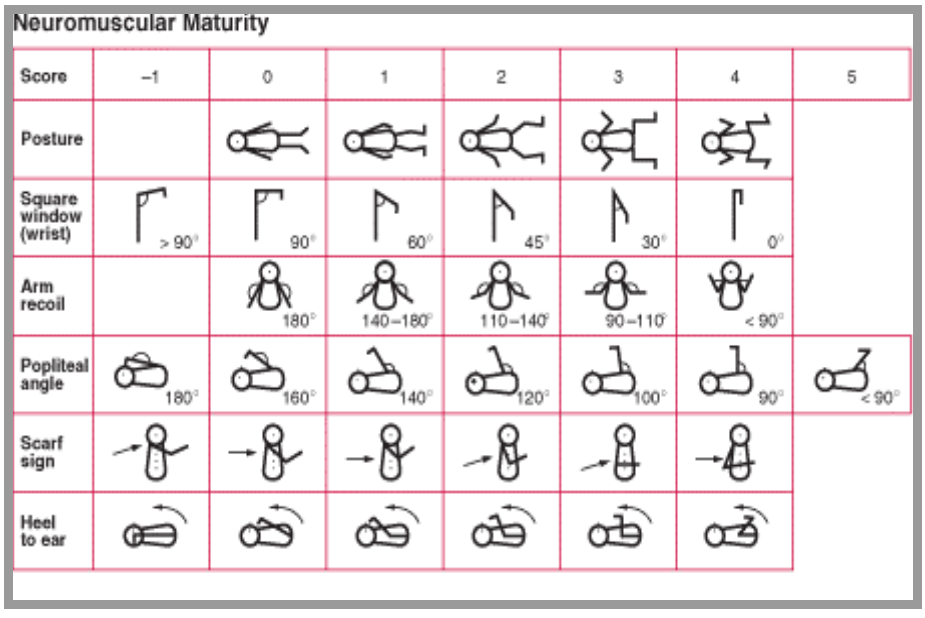
Preterm	RDS , TTN.
Post term	MAS , PPHN.

PROM with chorioamniotis	pneumonia.
Prolonged amniotic fluid leak	pulmonary hypoplesia.
Meconium stained amniotic fluid	MAS, PPHN.
Fetal distress	MAS , PPHN.
Oligohydramnios	pulmonary hypoplesia.
Diabetic distress	RDS.
Polyhydramnios	Trachea esophegal fistula.
Hydrops	CHF, Pulmonary hypoplesia.
Antepartum haemorrhage	anemia , CHF.[45,47]

EXAMINATION

Gestational age assessment

Dubowitz developed a scoring system with 11 physical and 10 neurological findings. Ballard and colleagues modified this Dubowitz scoring to 7 physical and 6 neurological.



Physical Maturity

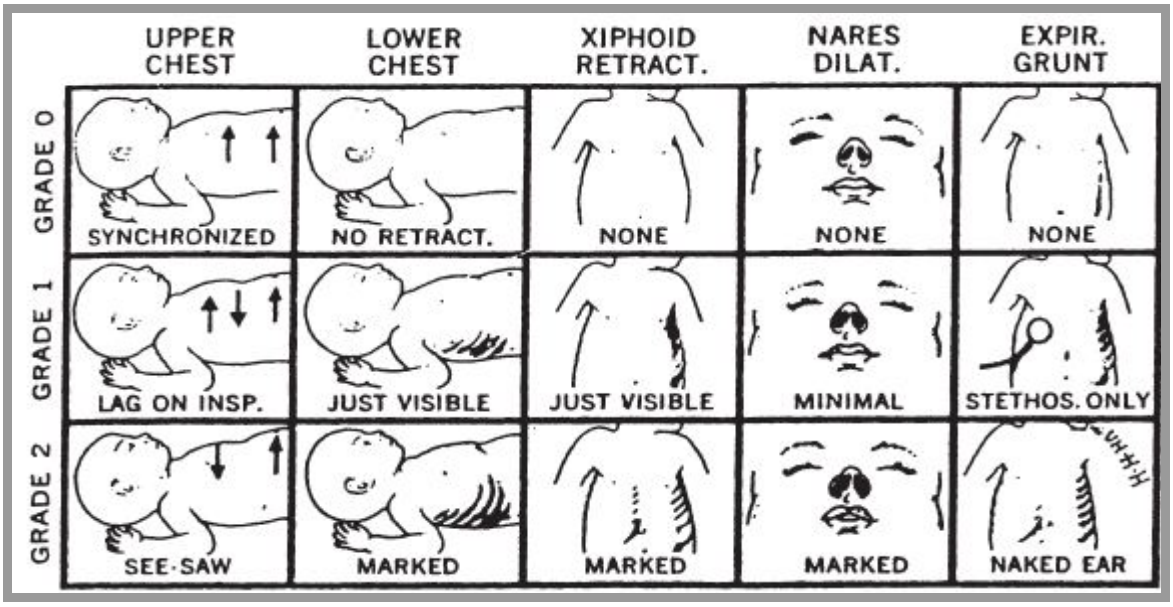
Skin	Sticky, friable, transparent	Gelatinous, red, translucent	Smooth, pink; visible veins	Superficial peeling and/or rash; few veins	Cracking, pale areas; rare veins	Parchment, deep cracking; no vessels	Leathery, cracked, wrinkled
Lanugo	None	Sparse	Abundant	Thinning	Bald areas	Mostly bald	
Plantar surface	Heel-toe 40–50 mm: –1 < 40 mm: –2	> 50 mm, no crease	Faint red marks	Anterior transverse crease only	Creases anterior 2/3	Creases over entire sole	
Breast	Imperceptible	Barely perceptible	Flat areola, no bud	Stippled areola, 1–2 mm bud	Raised areola, 3–4 mm bud	Full areola, 5–10 mm bud	
Eye/Ear	Lids fused loosely: –1 tightly: –2	Lids open; pinna flat; stays folded	Slightly curved pinna; soft; slow recoil	Well curved pinna; soft but ready recoil	Formed and firm, instant recoil	Thick cartilage, ear stiff	
Genitals (male)	Scrotum flat, smooth	Scrotum empty, faint rugae	Testes in upper canal, rare rugae	Testes descending, few rugae	Testes down, good rugae	Testes pendulous, deep rugae	
Genitals (female)	Clitoris prominent, labia flat	Clitoris prominent, small labia minora	Clitoris prominent, enlarging minora	Majora and minora equally prominent	Majora large, minora small	Majora cover clitoris and minora	

Maturity Rating

Score	Weeks
–10	20
–5	22
0	24
5	26
10	28
15	30
20	32
25	34
30	36
35	38
40	40
45	42
50	44

METHODS OF ASSESSING RESPIRATORY DISTRESS

William A Anderson and Dorothy H Anderson with assistance of Dr. Vrigina Apgar in 1954 described an clinical scoring system to evaluate respiratory distress. This scoring system is devised for continues evaluation of respiratory distress. This index is determined by grading each of the five arbitrary criteria. Chest lag ,intercoastal retraction, xiphoid retraction, nasal flaring, grunting.



In may 12,1916Edwin.B.Crigin stated this in his address to the eastern medical society in New York “one this must always be born in mind, that no matter how carefully uterine incision is sutured, we can never be certain that the cicatrized uterine wall will stand a subsequent pregnancy and labourwith out rupture. This means that the usual rule is “once a caesarean always a caesarean”. This statement was issued when classical caesarean was in vogue and utilization of antibiotic and blood transfusion was unknown, with present day medical knowledge the dictum is “the optimal management after previous cesaren”.46,50 Reluctance to give trial for vaginal delivery is due to difficulty in assessing the scare rupture late in pregnancy or late in labour but the previous studies show that chances of scare rupture are often rare. This tendency to resist caesarean arose from the wish not to compromise a patients Obstetric future.For successful delivery after a previous caesarean section the Obstetrician requires to have the expertise to carefully select the patients, for trial of labour because rupture of scar can endanger the life of both mother and her child. For more than 15years united states vital statistics data have indicated a 1.5 fold increased risk in neonatal mortality after caesarean delivery (both planed and unplanned)

compared to vaginal delivery ,though this has been assumed due to greater proportion of high risk pregnancies, the risk is also more in those who underwent caesarean after trial of labour.50

Pregnancy and childbirth after CS -When advising about the mode of birth after a previous CS consider

- maternal preferences and priorities
- the risks and benefits of repeat CS
- the risks and benefits of planned vaginal birth after cs .

Babies born by CS are more likely to have a lower temperature, and thermal care should be in accordance with good practice for thermal care of the newborn baby hence early skin-to-skin contact between the woman and her baby should be encouraged and facilitated, it also improves maternal perceptions of their infant, mothering skills, maternal behavior, breastfeeding outcomes, and reduces infant crying. Neonates born by LSCS are at increased risk of delayed onset of breastfeeding and thus developing hypoglycemia hence help should be offered to all those women who undergone LSCS. catecholamine surge that occurs during labor likely plays an important role in both clearance of fetal lung fluid and glycemic control after birth . The differences seen between the intended elective repeat cesarean delivery and VBAC groups take on greater significance when neonates born after failed VBAC delivery, who required the greatest measures of resuscitation due to fetal distress, characterized by nonreassuring fetal heart tones and meconium-stained amniotic fluid. At the other extreme, neonates born after successful VBAC had the lowest rates of

admission to the NICU, shortest hospital stay, and the lowest incidence of ongoing respiratory support .[51]

A U.S population based study showed that neonatal mortality was increased more then 2 fold after birth by caesarean even after excluding infants with congenital anomalies and presumed intrapartum hypoxic event (APGAR <4).Trial of labour after caesarean delivery (VBAC) has a risk of uterine rupture and perinatal asphyxia.[52]

In a study conducted in university of Colorado hospital U.S in 2009 showed that neonates born by ECD had higher rates of NICU admission, continuous positive airway pressure and those born by failed VBAC had even high rate of bag n mask ventilation and endotracheal intubation .[53]

A 7 year retrospective study analysis in Netherlands shows that the risk NICU admission was higher if the neonate was born before 39weeks of gestation, the absolute risk were 20.6% <38 weeks and 12.5% <39wks and 9.5% for ≥39wks .More than 50% caesarean are done before 39 wks thus jeopardizing neonatal out come.54 Percentage of fetal mortality in VBAC is 2.7% and in LSCS is 2-4.4%, cerebral palsy in VBAC is 0.12% and in LSCS 0.12%,birth trauma in VBAC is 0.27% and in LSCS is 0.12%,NICU stay in VBAC is 2% and in LSCS 16.2%,death in VBAC is 0.45 – 0.5 % and in LACS is 0.1-0.5% .[54]

A prospective study was carried out from 1st January 2007 to 31st December, 2007 on 126 women with one prior lower segment cesarean section (LSCS) for a non recurrent cause compares the neonatal complications in vaginal deliveries and repeat caesarean group.Some neonatal complications like birth asphyxia, neonatal infection were more in repeat caesarean section then in vaginally delivered neonates.[55]

VAGINAL DELIVERY

Parameter	number
Still birth	1
Birth asphyxia	1
Neonatal septicemia	2
Neonatal jaundice	2

REPEAT CAESAREN SECTION

Parameter	number
Still birth	1
Birth asphyxia	5
Neonatal septicemia	4
Neonatal jaundice	5

In a prospective observational study carried out by shruthi et al[56] India from August 2010 to July 2012, Neonatal outcome was compared with the following parameters, whether the baby is live or still born, full term or preterm, baby birth weight, Apgar score of baby at one minute and five minutes, NICU admission and if there is any neonatal mortality, cause of mortality and number of days of admissions at NICU. Total 69 cases were delivered by caesarean section, 66 (95.65%) were live birth and 3 (4.35%) were still births, while in vaginal delivery all 31 study cases had live births. On analyzing Apgar score at 5 minutes in neonates after elective caesarean section, it was found as 28 had Apgar score above 8 and after vaginal delivery 20 neonates had Apgar score above 8, 5 neonates had Apgar score between 7-8, 4 neonates had Apgar score between 3-4 & 2 neonates had Apgar score between 3-4 .[56]

Cole et al [57] in 1994 performed a case control study of 60 patients in which they examined the odds of developing hypoglycemia in vaginal deliveries vs elective cesarean sections. They found a higher incidence of neonatal hypoglycemia in cesarean sections, suggesting that hypoglycemia can be affected by either the mode of delivery or the process of labor itself.[57]

In a study conducted by ShrutiS.Goel et al[58] to know the outcome of post caesarean pregnancy and comparison of maternal and foetal outcome following vaginal birth versus repeat caesarean section in a rural hospital demonstrates that the morbidity due to emergency caesarean section was higher as compared to elective caesarean section and vaginal birth after caesarean section.[58] On analyzing Apgar score at 5 minutes, in neonates who were delivered with emergency caesarean section, 15 (44.11%) neonates had Apgar score in the range of >8,12 (35.29%) had score in the range of 7-8, 5 (14.7%) neonates had Apgar score in range of 5-6, 2 (5.81%) neonates had Apgar score in the range of 3-4 and 0 (0.00%) neonates had Apgar score less than 3. After vaginal delivery 20 (28.99%) neonates had Apgar score above 8, 5 (7.25%) neonates had Apgar score between 7-8, 4 (12.90%) neonates had Apgar score between 3-4 and 2 (6.45%) neonates had Apgar score between 3-4. This difference was found to be statistically significant (p value<0.001, S).[58]This study concluded that Substantial reduction in the caesarean rate can be achieved safely and efficiently by encouraging the trial of labour in women with a single previous caesarean delivery. Caesarean section should not be always followed by repeat caesarean section but patients must have hospital delivery in well-equipped hospital and complications

should be diagnosed at an early stage so that we can prevent maternal/ perinatal mortality and morbidity . [58]

Analysis of mode of delivery in women with previous one cesarean section conducted by shah Jitesh Mafatlal et al[59] demonstrated that most common indication for repeat cesarean section was metarnal desire. Neonatal complications were seen in eight neonates in repeat LSCS group requiring NICU admissions; one for fever, one for birth asphyxia ,two for jaundice, four for respiratory distress. Four neonates in vaginal delivery group required NICU admissions; one for birth asphyxia, one for septicemia and two for jaundice. All were discharged in good condition. There was no statistically significant difference in Apgar scores at one and five minutes in both the groups.[59]

Neonatal Outcomes After Elective Cesarean Delivery conducted by Beena D. Kamath et al[60] demonstrates that primary outcome, admission to the NICU, the incidence was 7.1% (n_48) in the full cohort of neonates, which included 9.3% of neonates born by intended elective repeat cesarean delivery and 4.9% of neonates born by intended VBAC (*P*_.025). There results show that significantly greater numbers of neonates in the intended cesarean group required oxygen and continuous positive airway pressure in the delivery room, ongoing oxygen supplementation once admitted to the NICU, and higher rates of admission for hypoglycemia. Neonates born by successful VBAC required the least amount of delivery room resuscitation.[60]

The multivariable logistic regression analysis shows that after adjustment for other covariates (maternal education level, chronic medical disease, amniocentesis performed for fetal lung maturity, chorioamnionitis, non reassuring fetal heart tones,

and gestational age in weeks) and compared with neonates born by successful VBAC, neonates born by elective repeat cesarean delivery without labor continued to demonstrate significantly higher odds of admission to the NICU.[61]Neonates born by intended elective repeat cesarean delivery required higher rates of oxygen supplementation and ventilatory support in the NICU, compared with neonates born in the intended VBAC group.Respiratory morbidity in neonates born after elective repeat cesarean delivery, particularly with an increase in respiratory distress syndrome, transient tachypnea of the newborn, persistent pulmonary hypertension, and need for supplemental oxygen.[61,62]

Respiratory morbidity as a result of failure to clear fetal lung fluid is common and can be challenging for neonates delivered by elective repeat cesarean delivery without being exposed to labor. the costs for the total birth (including delivery fees for the mother and NICU use fees for the neonate) for neonates born by successful VBAC delivery were the lowest.[63,64]

Neonatal hypoglycemia in term, nondiabetic pregnancies counduted by Amy M et al[65,66] demonstrated that elective LSCS, lower gestational age , maternal fever had higher incidence of hypoglycemia requiring NICU admissions.[65,66]

MATERIALS AND METHODS:

STUDY GROUP:

All neonates born by elective and repeat elective LSCS and VBAC in RLJH & RC attached to Sri Devaraj Urs Medical College (SDUMC) **.**

METHODS: study was conducted in all neonates born by elective LSCS, repeat elective LSCS and VBAC. The neonates enrolled were studied for---

A. Neonates requiring any intervention and NICU admissions were observed for morbidity patterns.

B. **Neonatal morbidity outcomes** (interventions) which were studied are-

1.*NICU admission*,

2.*Requirement of oxygen at resuscitation*,

3.*Apgar at 1minute &5 minutes*,

4.*Meconium passage at birth(MSAF*),

5.*Physiologic jaundice*,

6.*Length of hospital stay*,

7.*Composite of respiratory morbidity* defined as a composite of bag or mask resuscitation, intubation, respiratory distress syndrome, transient tachypnoea of newborn and meconium aspiration syndrome and

8.*Composite of neurologic morbidity* defined as hypoxic ishcemic encephalopathy,periventricular leucomalacia, hydrocephalus,periventricular haemmorrhage, intraventricular haemmorrhage (grade II-IV),subarachnoid haemmorrhage and intracranial infarct.

9. *Infections*- includes sepsis, acquired pneumonia,conjunctivitis and any other bacterial infection.

Neonatal mortality if any in these babies were also be recorded.

C. The overall cost of hospital expenditure of the neonates enrolled were recorded and compared depending on the mode of delivery i.e. ECD v/s repeat ECD v/s VBAC.

Results obtained were studied and compared between neonates born from elective LSCS, repeat LSCS and neonates delivered by VBAC

Method of collection of data:

SAMPLE SIZE: All neonates born by elective LSCS, repeat LSCS and VBAC born at RLJH during December 2012 and april 2013 were included in the study.

Statistical analysis

Method of Statistical Analysis:

The following methods of statistical analysis have been used in this study. The Excel and SPSS (Ver 11.5,SPSS Inc, Chicago) software packages were used for data entry and analysis.

The results were averaged (mean ± standard deviation) for each parameter for continuous data and numbers and percentage for categorical data presented in Table and Figure.

1) Proportions were compared using Chi-square test of signifSicance

Chi-Square ($?^2$) test for (r x c tables)

Rows	Columns			Total
	1	2…… …..	c	
1	a_1	a_2	a_c	t_1
2	b_1	b_2	b_c	t_2
.	.	……	.	.
.	.	…….	.	.
r	h_1	h_2	h_c	t_r
Total	n_1	n_2	n_c	N

a,b…..h are the observed numbers.

N is the Grand Total

$$?^2 = N\left[\frac{1}{t_1}\sum_1^c \frac{a_1^2}{n_i} + \frac{1}{t_2}\sum_1^c \frac{b_1^2}{n_i} + \ldots\ldots\ldots\ldots + \frac{1}{t_r}\sum_1^c \frac{h_1^2}{n_i} - 1\right]$$

DF=(r-1)*(c-1), where r=rows and c=columns

DF= Degrees of Freedom (Number of observation that are free to vary after certain Restriction have been placed on the data)

2) One way Analysis of Variance (Anova)

One way analyses of variance were used to test the difference between groups. Analysis of Variance is a technique by which the total variation is split into two parts one between groups and the other within the groups. If 'F' value is significant there is a significant, difference between group means. To find out which of the two groups means is significantly difference post hoc test of Tukey test is used. In case of F value is not significant it indicates that there is no significant difference between the groups and stops the analysis at this stage and does not used Tukey test.

The formula used:

$$F = \frac{MS_{betweengroups}}{MS_{Withingroups}}$$ where MS=Mean Sum of Square

In all the above test a “p” value of less than 0.05 was accepted as indicating statistical significance.

RESULTS

During the study period there were total 660 deliveries, of which 66 were included in this study. It constituted 10%.

In the present study we have evaluated various parameters of neonatal outcome in neonates born by VBAC, elective LSCS, repeat elective LSCS group.

MODE OF DELIVERY

TABLE 1

Mode of Delivery	Frequency	Percent
Elective LSCS	18	27.3%
Repeat Elective LSCS	27	40.9%
VBAC	21	31.8%
Total	**66**	**100.0%**

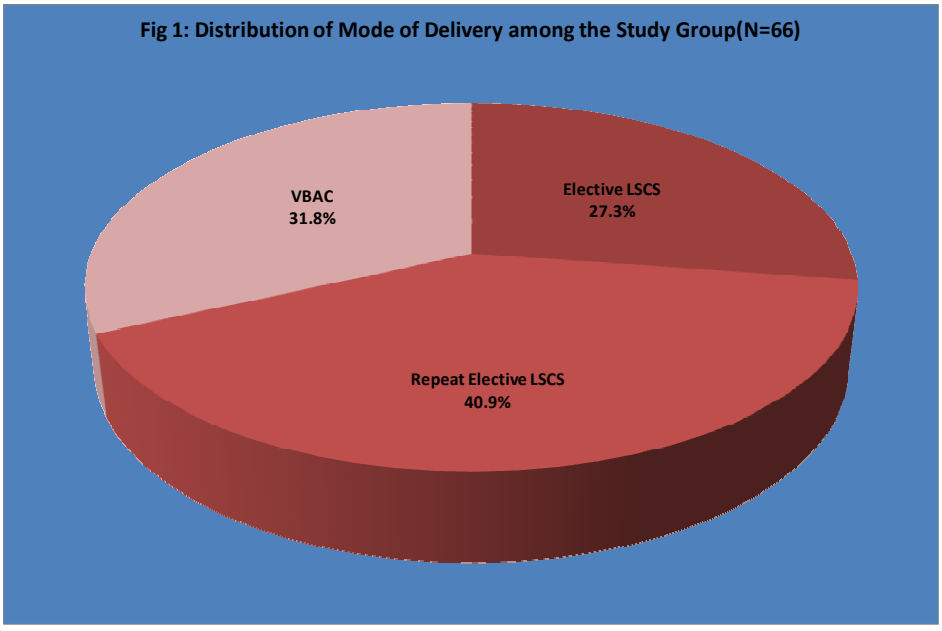


FIGURE 1

Figure 1 and table 1 show the incidence of different mode of delivery included in our study. Repeat elective LSCS has the highest incidence of 40.9%, VBAC 31.8% and elective LSCS of 27.3%.

INDICATION FOR MODE OF DELIVERY

TABLE 2

Indication	Mode of Delivery						Total	
	Elective LSCS		Repeat Elective LSCS		VBAC			
	n	%	n	%	n	%	n	%
CPD	6	33.3%	0	.0%	0	.0%	6	9.1%
K/C/O Rhd	1	5.6%	0	.0%	0	.0%	1	1.5%
Metarnal Desire	8	44.4%	0	.0%	0	.0%	8	12.1%
Morbidly Obese,Cpd	1	5.6%	0	.0%	0	.0%	1	1.5%
Nil	0	.0%	0	.0%	21	100.0 %	21	31.8%
Prev LSCS	0	.0%	25	92.6%	0	.0%	25	37.9%
Prev LSCS+ Res Distr	0	.0%	1	3.7%	0	.0%	1	1.5%
PrevLSCS+Maternal Desire	1	5.6%	1	3.7%	0	.0%	2	3.0%
Prolonged Infertility+Hypothyporoidism	1	5.6%	0	.0%	0	.0%	1	1.5%
Total	18	100.0 %	27	100.0%	21	100.0 %	66	100.0%

FIGURE 2

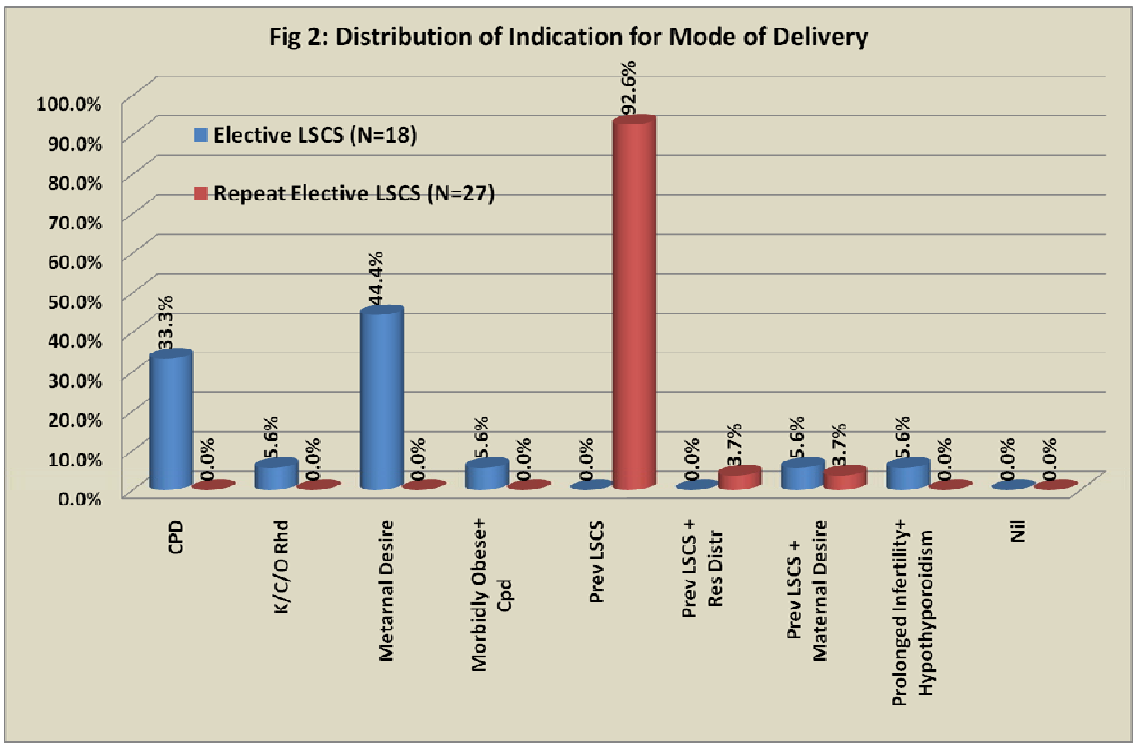


Figure 2 and table 2 show the incidence of different indications for elective or repeat elective LSCS. In elective LSCS maternal desire had the highest incidence followed by CPD, K/C/O rheumatic heart disease, morbidly obese.

In repeat elective LSCS previous LSCS has the highest incidence followed by previous LSCS with maternal desire.

APGAR AT 1, 5 AND 10 MIN

TABLE 3

		N	Mean	SD	Min.	Max.	'F' value	'p' value
Apgar 1 min	**Elective LSCS**	18	7	.428	7	8	**7.954**	**0.001**
	Repeat Elective LSCS	27	7	.594	6	9		
	VBAC	21	6	1.682	3	8		
Apgar 5min	**Elective LSCS**	18	8	.428	8	9		**<0.001**
	Repeat Elective LSCS	27	9	.424	8	9		
	VBAC	21	9	.512	7	9		
							10.302	

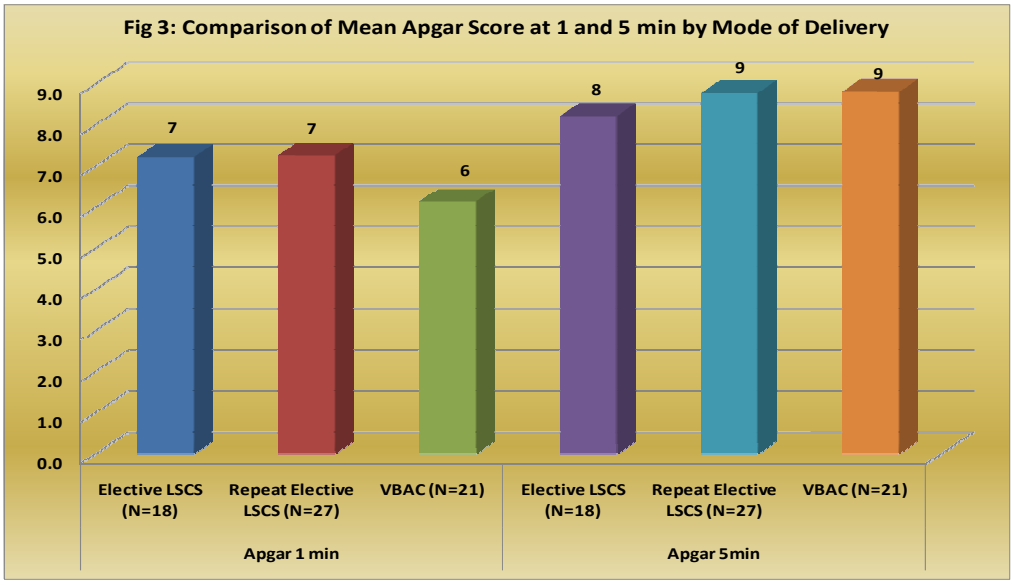


FIGURE 3

Figure 3 and table 3 explain about the APGAR values at 1 and 5 minutes. Lowest values of APGAR at 1 min where noted in VBAC group which was statistically significant (<0.001) and no difference was noted in APGAR score of neonates in other to group. Slightly low level of APGAR values at 5 min's where noted in neonates born by elective LSCS, improved values of APGAR in VBAC group could be attributed to effective resuscitation of these newborn. No statistically significant difference in APGAR values was noted in among the neonates born by elective and repeat elective LSCS indicating low chances of exposure to risk factors for antenatal distress. VBAC cases if not monitored properly antenataly could go for perinatal hypoxia.

BIRTH WEIGHT

TABLE 4

Mode of Delivery	Birth Weight						Total		c2 value	'p' value
	<2.5 kg		2.5-3.0 kg		>3.0 kg					
	n	%	n	%	n	%	n	%		
Elective LSCS	3	16.7%	10	55.6%	5	27.8%	18	100.0%	7.228	0.124
Repeat Elective LSCS	2	7.4%	12	44.4%	13	48.1%	27	100.0%		
VBAC	5	23.8%	13	61.9%	3	14.3%	21	100.0%		
Total	10	15.2%	35	53.0%	21	31.8%	66	100.0%		

FIGURE 4

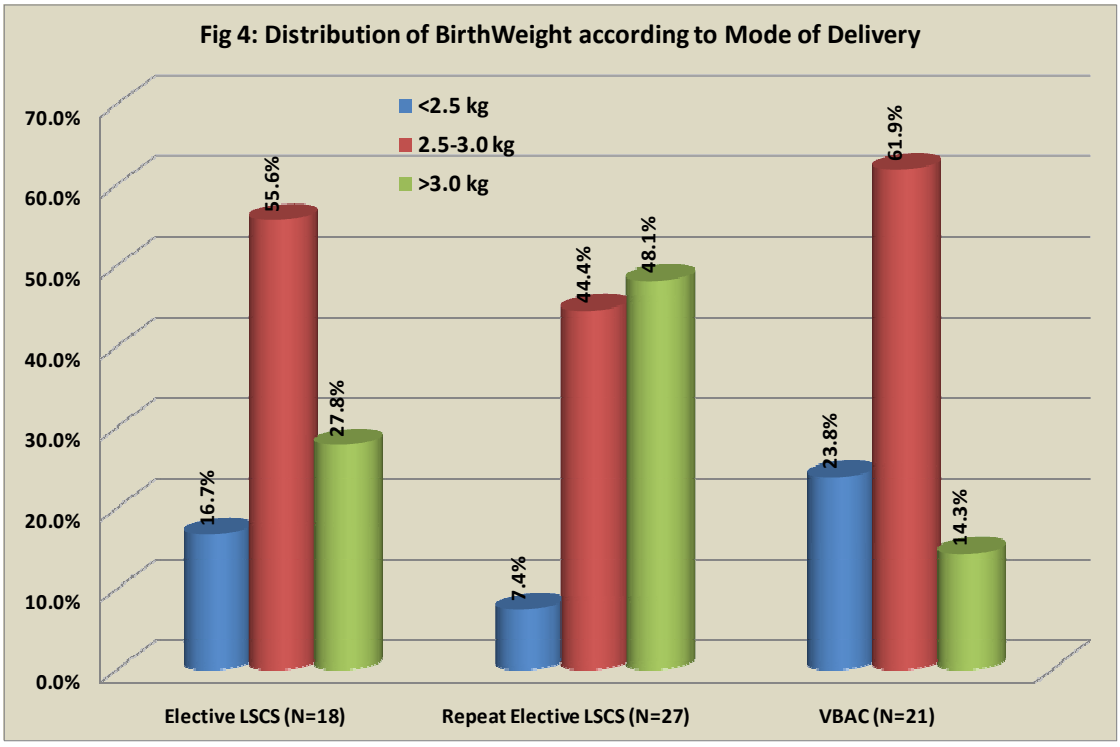


Figure 4 and table 4 explain the pattern of birth weight of neonates born by different mode of delivery. In elective LSCS maximum number of neonates weighed between 2.5 - 3 kgs followed by neonates weighing more then 3kgs and least number of neonates weighed less then 2 kgs. In repeat elective LSCS highest number of neonates weighed more then 3kgs, followed by neonates weighing between 2.5 - 3 kgs, and neonates weighing less then 2 kgs were least. In VBAC maximum number of neonates born weighed between 2.5 to 3 kgs followed by neonates who weighed less then 2.5 kgs and least number of neonates weighed more then 3 kgs. Higher percentage of neonates weighing more then 3 kgs were born by elective and repeat elective LSCS and percentage of neonates weighing less then 2.5 kgs were born by VBAC.

COMPARISON OF MEAN BIRTH WEIGHT BY MODE OF DELIVERY

TABLE 5

Comparison between		Mean Difference (I-J)	'p' value
Elective LSCS	**Repeat Elective LSCS**	-0.156	0.552
	VBAC	0.219	0.307
Repeat Elective LSCS	**VBAC**	0.375	0.011

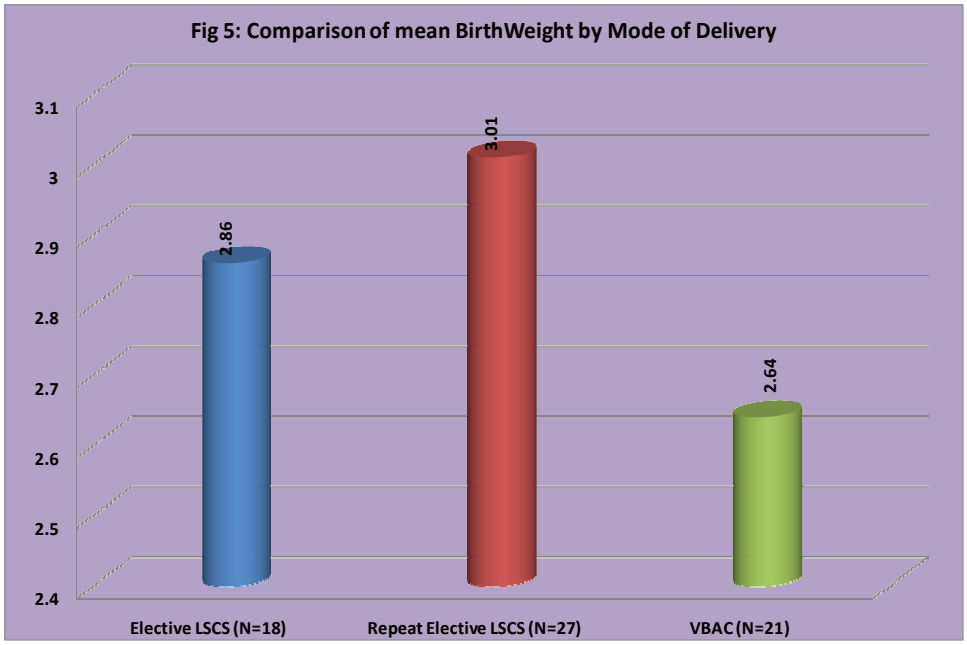


FIGURE 5

In figure5 mean birth weight was compared in all three groups, mean birth weight in elective LSCS was 2.86 kgs, in repeat elective LSCS was 3.01kgs and VABC had least mean birth weight of 2.64 kg.

MODE OF DELIVERY AND NICU ADMISSION

Table 6

Mode of Delivery	NICU Admission				Total		c2 value	'p' value
	Yes		No					
	n	%	n	%	n	%		
Elective LSCS	6	33.3%	12	66.7%	18	100.0%		
Repeat Elective LSCS	8	29.6%	19	70.4%	27	100.0%		
VBAC	7	33.3%	14	66.7%	21	100.0%	**0.101**	**0.951**
Total	21	31.8%	45	68.2%	66	100.0%		

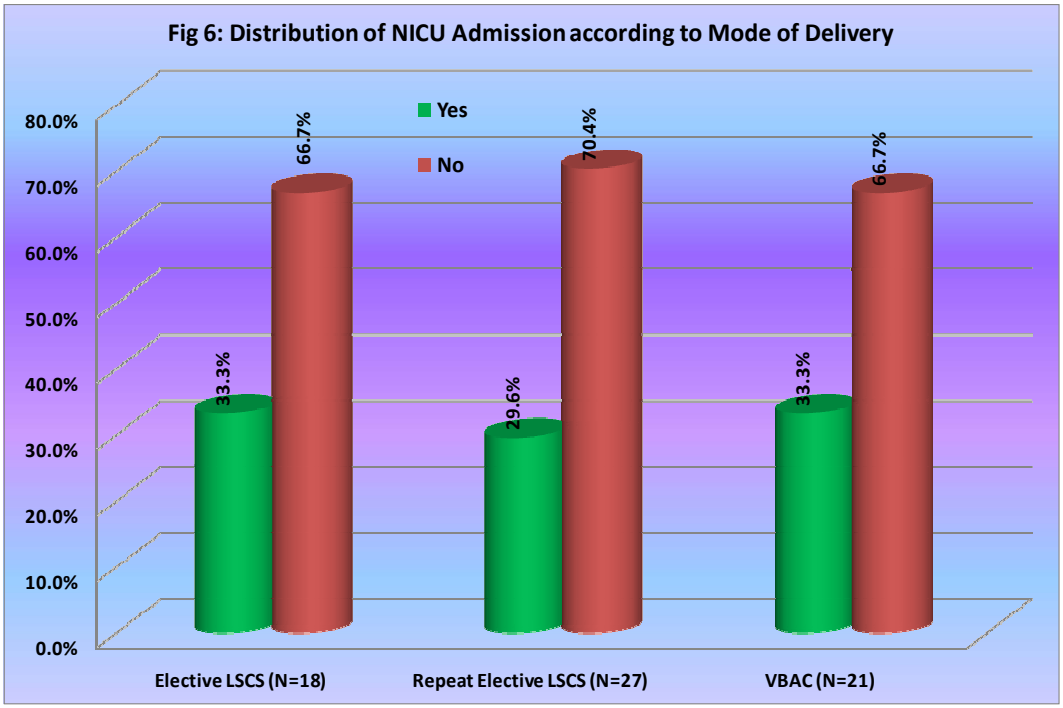


FIGURE 6

Figure 6 and table 6 show the percentage of NICU admission in all three groups. Elective LSCS and VBAC has equal percentage of NICU admission followed by repeat elective LSCS.

INDICATION FOR NICU ADMISSION

Mode of Delivery	Reason for NICU Admission								Total
	NA	Ba	Hypo glycemia	Lbw	Lbw+ Sepsis	Low Apgar	Low Apgar + Res Dis	Res Dis	
Elective LSCS	12	0	0	0	0	0	0	6	**18**
	66.7%	.0%	.0%	.0%	.0%	.0%	.0%	33.3%	**100.0%**
Repeat Elective LSCS	19	0	1	0	0	1	0	6	**27**
	70.4%	.0%	3.7%	.0%	.0%	3.7%	.0%	22.2%	**100.0%**
VBAC	14	1	1	1	1	0	2	1	**21**
	66.7%	4.8%	4.8%	4.8%	4.8%	.0%	9.5%	4.8%	**100.0%**
Total	45	1	2	1	1	1	2	13	**66**
	68.2%	1.5%	3.0%	1.5%	1.5%	1.5%	3.0%	19.7%	**100.0%**

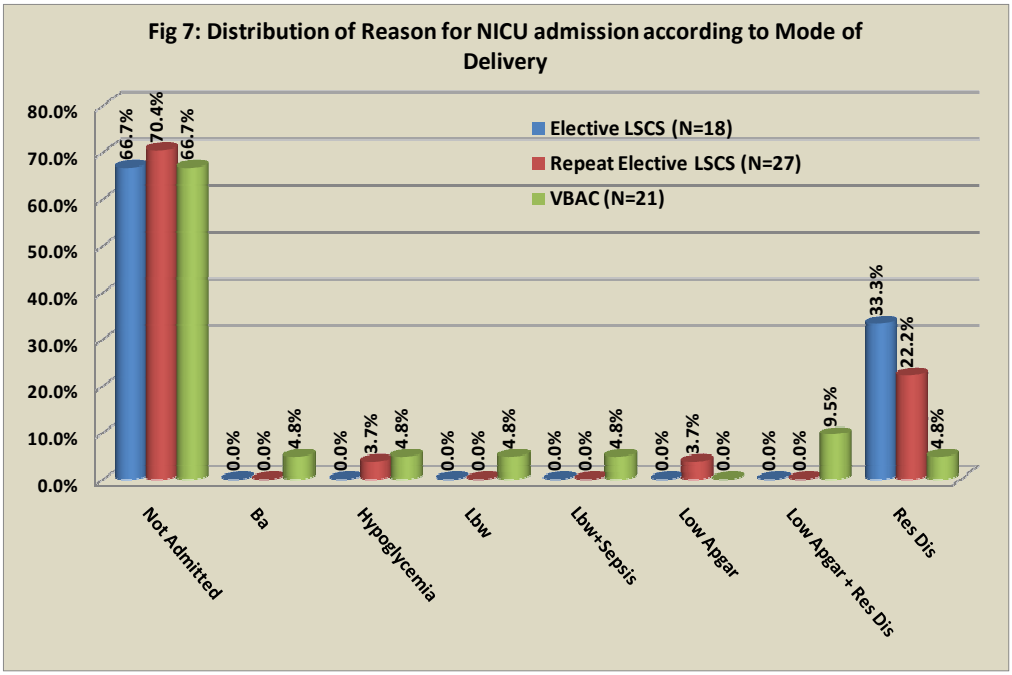


FIGURE 7

Figure 7 and table 7 explains about the incidence of various indications for NICU admissions. In elective LSCS respiratory distress was a single significant indication for NICU admission, in repeat elective LSCS incidence of respiratory LSCS was highest followed by low APGAR, hypoglycemia. In VBAC group birth asphyxia, hypoglycemia , low birth weight, sepsis, and respiratory distress had equal incidence, although higher incidence was noticed low APGAR with respiratory distress.

PHOTOTHERAPY AND MODE OF DELIVERY

TABLE 8

Mode of Delivery	Photo				Total		$\chi 2$ value	'p' value
	Yes		No					
	n	%	n	%	n	%		
Elective LSCS	7	38.9%	11	61.1%	18	100.0%	0.139	0.933
Repeat Elective LSCS	12	44.4%	15	55.6%	27	100.0%		
VBAC	9	42.9%	12	57.1%	21	100.0%		
Total	28	42.4%	38	57.6%	66	100.0%		

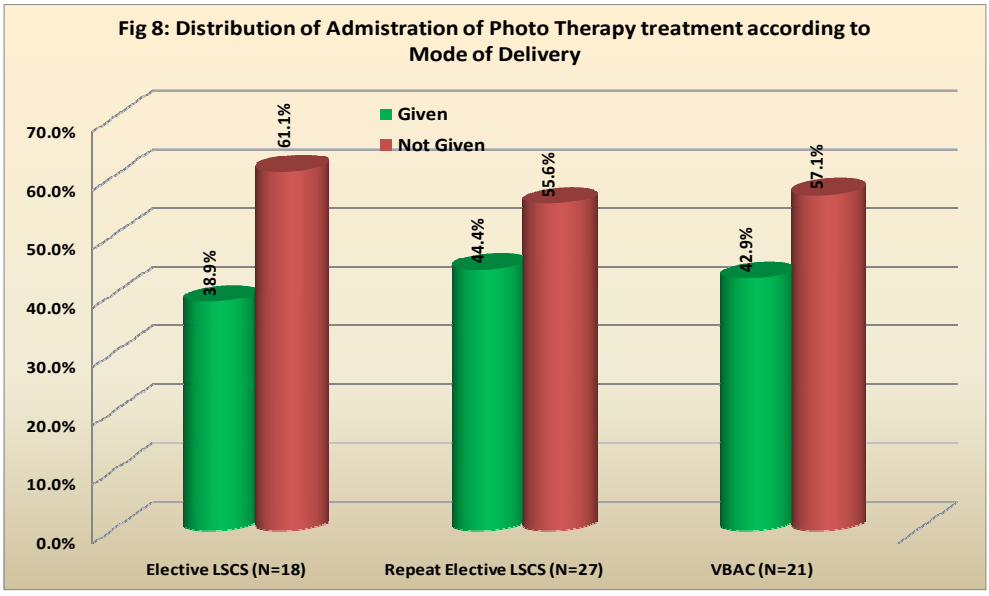


FIGURE 8

Administration of phototherapy for neonates in all three group had no significant difference. 38.9% of neonates born by elective LSCS received phototherapy , 44.4% of neonates born by repeat elective LSCS, 42.9% of neonates born by VBAC received phototherapy.

SEPSIS AND MODE OF DELIVERY

TABLE 9

Mode of Delivery	Sepsis				Total		χ2 value	'p' value
	Yes		No					
	n	%	n	%	n	%		
Elective LSCS	3	16.7%	15	83.3%	18	100.0%	1.020	0.600
Repeat Elective LSCS	5	18.5%	22	81.5%	27	100.0%		
VBAC	6	28.6%	15	71.4%	21	100.0%		
Total	14	21.2%	52	78.8%	66	100.0%		

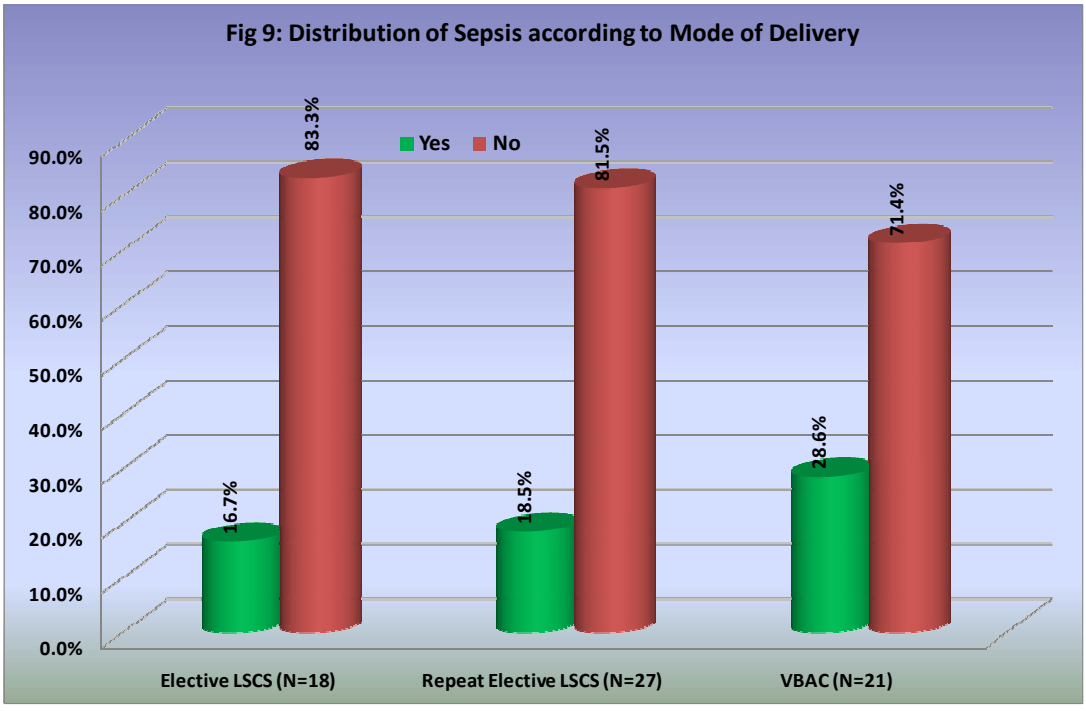


FIGURE 9

Figure 9 and table 9 shows that neonates born by VBAC 28.6% neonates were diagnosed and treated for sepsis. In neonates born by elective LSCS 16.7% had sepsis and in repeat elective LSCS 18.5% had sepsis.

NICU Stay(Days)

TABLE 10

Mode of Delivery	N	Mean	SD	Median	Min.	Max.	'F' value	'p' value
Elective LSCS	6	4.00	1.949	5.00	1	6	**0.085**	**0.919**
Repeat Elective LSCS	8	3.62	1.923	3.00	2	7		
VBAC	7	4.14	3.388	3.00	1	11		
Total	**21**	**3.90**	**2.406**	**3.50**	**1**	**11**		

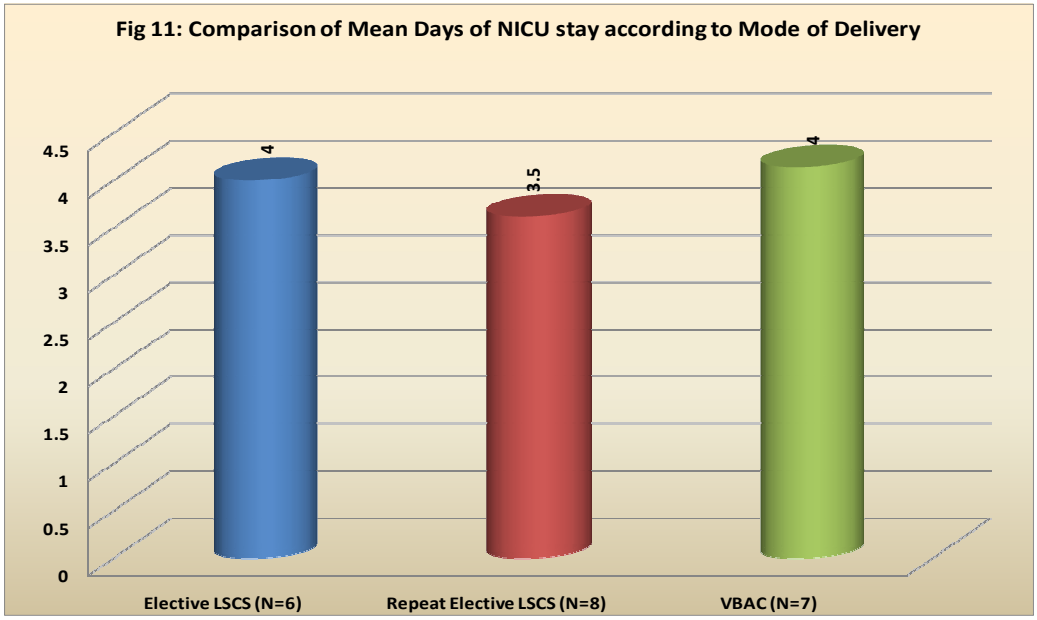


FIGURE 10

Figure 10 and table 10 explains about the mean days of NICU stay for neonates born in above mentioned three modes of delivery. The mean duration of stay for neonates born elective LSCS was 4 days, for neonates born by repeat elective LSCS it was 3.5 days and for neonates born by VBAC it was again 4 days. So there was no significant difference seen in mean duration of NICU stay for neonates born above mentioned three mode of delivery.

EXPENDITURE AND MODE OF DELIVERY

Table 11

Mode of Delivery	Expenses						Total		c2 value	'p' value
	<5000		5000-10000		>10000					
	n	%	n	%	n	%	n	%		
Elective LSCS	6	33.3%	7	38.9%	5	27.8%	18	100.0%	5.527	0.237
Repeat Elective LSCS	12	44.4%	11	40.7%	4	14.8%	27	100.0%		
VBAC	14	66.7%	4	19.0%	3	14.3%	21	100.0%		
Total	**32**	**48.5%**	**22**	**33.3 %**	**12**	**18.2%**	**66**	**100.0%**		

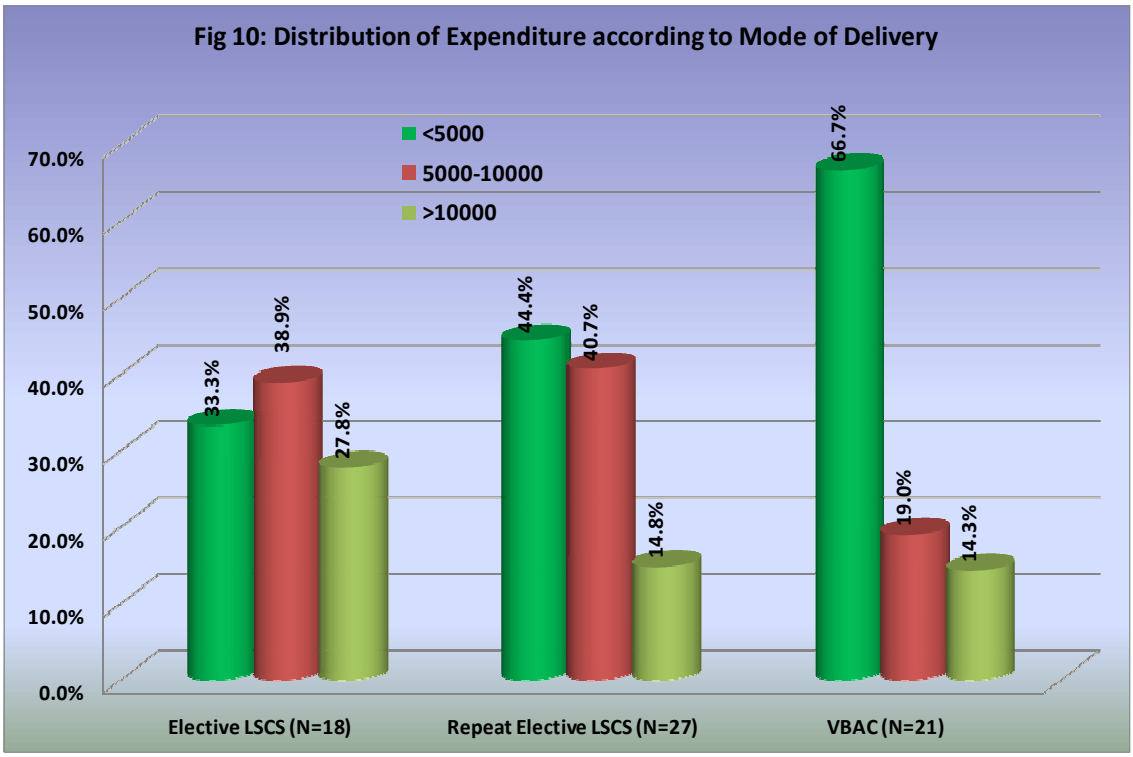


FIGURE 11

Figure 11and table 11 depict the total expenditure in neonatal care during hospital stay for neonates born with above mentioned mode of delivery.

In neonates born by elective LSCS expenditure of 38.9% of neonates was between Rs5000/- to Rs10000/-, 33.3% neonates had less than Rs5000/-, 27.8% neonates had more then Rs 10000/-. In neonates born by repeat elective LSCS expenditure of 44.4% neonates was less than Rs5000/-, 40.7% neonates had between Rs 5000/ to Rs 10000/-, and 14.8% neonates had more then Rs 10000/-. In neonates born by VBAC expenditure of 66.7% neonates was less then Rs 5000/-, 19% neonates was between Rs 5000/- to Rs 10000/-, and 14.3% neonates had more then Rs 10000/-. In neonates born by elective LSCS and repeat elective LSCS majority of neonates had expenditure of Rs 5000/- to Rs 10000/-, in VBAC group majority had less then Rs 5000/-.

DISCUSSION

There is worldwide public and professional concern about increasing proportion of birth by elective cesarean section worldwide. Increasing rate of primary elective cesarean section have led to higher proportion of the obstetric population who have a history of prior elective LSCS. Pregnant women with a prior elective section may be offered either VBAC or repeat LSCS. The proportion of women, who decline VBAC, is in turn a significant determinant of over all rate of cesarean birth.

New evidence emerging indicates that VBAC may not be as safe as originally thought. But reports are conflicting and also medico legal concerns have led to decline in the clinicians offering VBAC as mode of delivery.

The present study evaluates the neonatal outcome in neonates delivered by elective LSCS, repeat elective LSCS, and VBAC in our hospital in the year 2013 - 2014.

10% of total number of patients delivered in our college where included in present study (**REFERENCE TABLE 1**)**.** In present study 27.3% of neonates where born by elective LSCS, 40.9% by repeat elective LSCS, 31.8% by VBAC during the study period. This high percentage of repeat elective LSCS can be explained by increasing trend of primary elective LSCS.

As in our study, a study conducted by Iqbal begam et al showed a higher incidence of VBAC compared to elective LSCS. The percentage of VBAC in the above mentioned study was 56% and elective LSCS was 43%. The same study also showed a higher percentage of neonates born by elective LSCS admitted to NICU for respiratory distress as in our study. 52% of neonates delivered by elective LSCS where admitted to NICU for respiratory distress and 12% neonates delivered by

VBAC were admitted following injury due to instrumental delivery and 6% for low APGAR.

In a study conducted by Shruti S Geol et al, India 60.78% of neonates were delivered by VBAC and 32% of neonates by elective LSCS.

PERCENTAGE OF DIFFERENT MODE OF DELIVERY

STUDY	**VBAC**	**ELEC LSCS**
Iqbal begam et al	56%	43%
Shruti S. Geol et al	60.78%	32%
Bhat BPR et al	70%	30%
Present study	**31.8%**	**27.3%**

In a study conducted by Shruti S. Geol et al showed Apgar score at 5 minutes in neonates after elective caesarean section, it was found as 28 (87.50%) had Apgar score above 8 and only 4 (12.5%) had Apgar score between 7-8. After vaginal delivery 20 (28.99%) neonates had Apgar score above 8, 5 (7.25%) neonates had Apgar score between 7-8 , 4 (12.90%) neonates had Apgar score between 7-5 and 2 (6.45%) neonates had Apgar score between 3-4, similar to results observed in our study **(REFERENCE TABLE 3)**. As seen in our study the percentage of neonates with low APGAR was more in VBAC group. This difference was found to be statistically significant (p value<0.001, S).

APGAR <5 AT 1 MIN IN DIFFERENT STUDY

STUDY	**APGAR <5 IN ELEC LSCS**	**APGAR <5 IN VBAC**
Shruti S. Geol et al	-	6.45%
Pembe AB et al	0.5%	5.5
PRESENT STUDY	**2%**	**6%**

In a study done by Shrut s. Geol et al showed that infants born after successful VBAC had the lowest rates of NICU admission of 4%, where as 17% of neonates born by elective LSCS had NICU admission.

PRESENTAGE OF NICU ADMISSION

STUDY	**ELECTIVE LSCS**	**VBAC**
Iqbal begam et al	52%	12%
Shrut s. Geol et al	17%	4%
PRESENT	**61.1%**	**57.1%**

In a study conducted Rana F. Et al showed that there was no significant difference seen in birth weight of neonates born by either mode of delivery. 2% of neonates delivered by VBAC developed hypoglycemia in immediate post natal period and 5% neonates delivered by elective LSCS had hypoglycemia although p value was not significant. In our study 3.7% of neonates delivered by elective LSCS had hypoglycemia and 4.8% of neonates delivered by VBAC had hypoglycemia **(REFERENCE TABLE7)**.

PERCENTAGE OF HYPOGLYCEMIA IN DIFFERNT MODE OF DELIVERY

STUDY	**ELECTIVE LSCS**	**VBAC**
Rana F. Et al	5%	2%
Shruti s. Geol et al	6%	3.5%
Present study	**3.7%**	**4.8%**

In a study conducted by Pembe AB et al showed 51.2%women delivered vaginally, 48.8%women delivered by elective LSCS. The incidence of VBAC was higher then elective LSCS unlike what was seen in our study. The most common indication of elective LSCS in this study was fetopelvic disproportion, in our study the most common indication for elective LSCS was maternal desire and followed by fetopelvic disproportion **(REFERENCE TABLE 2)**.Four neonates in repeat LSCS group required NICU admissions; one for fever, one for birth asphyxia and two for jaundice.Five neonates in vaginal delivery group required NICU admissions; two for birth asphyxia, one for septicemia and two for jaundice.In our study respiratory distress was the most common indication for NICU admission in neonates born by elective LSCS, were as in VBAC it was low APGAR at birth S. As in this study there was no significant difference seen in neonates receiving phototherapy, 38.9% of neonates in elective LSCS received phototherapy, 44.4% in repeat elective LSCS and 42.9% in VBAC, although the percentage was slightly higher in VBAC group p value was not significant **(REFERENCE TABLE 8)** .

As a study conducted by Amy M. DePuy et al ,on **Neonatal hypoglycemia in term, nondiabetic pregnancies** did not show any difference in the incidence of hypoglycemia in neonates born by elective LSCS or VBAC, there was no significant difference observed in our study among neonates born by above mentioned three mode of delivery. In repeat elective LSCS 3.7% of neonates developed hypoglycemia, and in VBAC 4.8% of neonates had hypoglycemia. P value was not significant **(REFERENCE CHART 7)**.

In a study done in Pauel M et al "Comparison of a trial of labour with an elective secound cesarean section " showed no significant difference in the incidence of hypoglycemia between the neonates born by VBAC and repeat elective LSC. 16% neonates in elective LSCS and 18% neonates in VBAC group had documented hypoglycemia, similar to reports found in our study.Neonatal death 13% in VBAC and 7 % in elective LSCS, no neonatal death was documented in our study.

In a study done by Beena Kamat et al showed that neonates of Cesarean group had higher risk for respiratory complications i.e 5.8 times higher (*P*=0.0001)manifested most often as transient tachypnea of the newborn and this risk decreased as advancing the gestational age. There were 4.5 times (*P*=0.0001) increase in the risk of development of hypothermia and a very significant development of feeding difficulty in early Cesarean group which were a surprising findings.In our study all the elective LSCS where conducted after completion of 37 wks.

CONCLUSION

- Repeat elective LSCS was the most common mode of delivery practiced following VBAC.

- Indication for more than 90% of cases of repeat elective LSCS was previous LSCS followed by maternal desire.

- The mean birth weight was lowest in VBAC group.

- Respiratory distress was the most common indication admission of NICU in neonates born by elective and repeat elective LSCS.

- Low APGAR, sepsis, hypoglycemia had higher incidence in VBAC group.

- VBAC group had a very low expenditure compared to other 2 groups

- Most common indication for elective LSCS is metarnal desire

SUMMARY

Present study was a hospital based observational study of 66 newborns delivered in R.L.Jalappa hospital Tamaka. The study was done to know the morbidity and mortality in neonates born by VBAC, elective LSCS, repeat elective LSCS, to know the interventions required in these neonates, and the cost effectiveness of neonatal care of newborn in all three groups.

Among the 66 cases 40.9% of cases were delivered by repeat elective LSCS, 31.8% of cases were delivered by VBAC, and 27.3% by elective LSCS. Most common indication for elective LSCS was metarnal desire, repeat elective LSCS was previous LSCS . Among the APGAR lowest mean APGAR was found in VBAC group. The highest mean birth weight was found in repeat elective LSCS and lowest mean birth weight was high in VBAC group.

The mean birth weight in repeat elective LSCS group was 3.01kgs, in elective LSCS group it was 2.86kgs, and in VBAC group it was 2.64kgs. A higher percentage of neonates delivered by elective LSCS and VBAC had NICU admission.

The percentage of NICU admission was highest in repeat elective LSCS and the most common indication was respiratory distress. The most common indication for NICU admission in neonates born by VBAC was low APGAR. The percentage of neonates diagnosed to have sepsis was highest in VBAC group.

Expenditure in neonatal care for the neonates born by VBAC was least and was highest in neonates born by elective LSCS

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ANNEUXRES

PROFORMA

Name of mother-

Age-

Name of father-

MOTHER DETAILS

Married life-

Booked -

Immunised-

Antenatal complication-

If yes specify-

BABY DETAILS

D.O.B-

Gestational age-

Birth weight-

Mode of delivery-

If LSCS indication-

MSAF-

APGAR SCORE-

POST NATAL DETAILS

Length of hospital stay-

Physiologic jaundice-

Ward admission-

NICU admission-

	MSAF	MAS	TTN	RDS	BLOOD CLUTURE	SEPSIS CLINICALLY	ACQUIRED PNEUMONIA	CONJUNCTIVITIS	HIE	PERIVENTRICULAR LEUCOMALACIA	HYDROCEPHALUS	PERIVENTRICULAR HAEMORRHAGE
D1												
D2												
D3												
D4												
D5												
D6												

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SL No	NAME	MOD	INDICATION	DOB	SEX	APGAR	BT WT	NICU	CAUSE	PHOTO	SEPSIS	NICU STAY	EXPEN
1	B/O RUKMINI	VBAC	NIL	6/1/2013	F	1-8/10, 5-9/10	2.56KGS	N	-	Y	-	-	< 5000/-
2	B/O GULZAR KHANUM	REPEAT ELECTIVE LSCS	PREV LSCS	15/1/2013	F	1-7/1O,5-9/10	2.8KGS	N	-	Y	-	-	5000 - 10000
3	B/O GAYATHRI	ELECTIVE LSCS	METARNAL DESIRE	21/1/2013	M	1-7/10,5-9/10	2.72KGS	Y	RES DIS	Y	-	1	5000-10000
4	B/O KOUSAR TAJ	REPEAT ELEC LSCS	PREV LSCS	8/2/2013	F	1-7/10,5-9/10	3.24KGS	N	-	Y	-	-	< 5000
5	B/O SHAZIYA KOUSAR	REPEAT ELEC LSCS	PREV LSCS	20/2/2013	M	1-7/10,5-9/10	2.9KGS	N	-	Y	-	-	5000-10000
6	B/O JAYANTHI	REPEAT ELECTIVE LSCS	PREV LSCS	5/4/2013	F	1-7/10,5-9/10	3.3KGS	Y	RES DIS	N	Y	6	> 10000
7	B/O KAMALASARASWATHI	REPEAT ELECTIVE LSCS	PREV LSCS	12/4/2013	F	1-8/10,5-9/10	3.23KGS	N	-	N	-	-	5000-10000
8	B/O SHILPA	REPEAT ELECTIVE LSCS	PREV LSCS	22/4/2013	M	1-7/10,5-9/10	2.7KGS	N	-	Y	-	-	<5000
9	B/0 MANJULA	VBAC	NIL	3/5/2013	F	1-7/10,5-9/10	2.7KGS	N	-`	N	-	-	< 5000
10	B/O SHILPA	ELECTIVE LSCS	CPD	5/5/2013	F	1-7/10,5-9/10	2.5KGS	Y	RES DIS	N	Y	5	> 10000
11	B/O KAVEENA	ELECTIVE LSCS	CPD	13/5/2013	F	1-8/10,5-9/10	2.7KGS	N	-	N	-	-	<5000
12	B/O JAYANTHI	REPEAT ELECTIVE LSCS	PREV LSCS	15/5/2013	M	1-8/10,5-9/10	2.9KGS	N	-	Y	-	-	< 5000
13	B/O SHILPA	REPEAT ELECTIVE LSCS	PREV LSCS	18/5/2013	F	1-8/10,5-9/10	2.5KGS	N	-	Y	-	-	5000 - 10000
14	B/O AMRIN TAJ	REPEAT ELECTIVE LSCS	PREV LSCS	21/5/2013	F	1-8/10,5-9/10	2.7KGS	N	-	Y	-	-	<5000
15	B/O FARHANA	ELECTIVE LSCS	PROLONGED INFERTILITY,HYPOTHYPOROIDISM	28/6/2013	F	1-8/10,5-8/10	3.28KGS	N	-	N	-	-	5000- 10000
16	B/O CHERISMA	ELECTIVE LSCS	METARNAL DESIRE	4/7/2013	F	1-8/10,5-8/10	3.15KGS	N	-	N	-	-	< 5000
17	B/O KARPAGAM	REPEAT ELECTIVE LSCS	PREV LSCS	4/7/2013	F	1-7/10,5-8/10	2.58KGS	N	-	Y	-	-	5000- 10000
18	B/O GAYATHRI	REPEAT ELECTIVE LSCS	PREV LSCS	5/7/2013	M	1-7/10,5-8/10	2.26KGS	Y	HYPOGLYCEMIA	N	-	3	5000- 10000
19	B/O RADHAMMA	REPEAT ELECTIVE LSCS	PREV LSCS	12/7/2013	F	1-7/10,5-8/10	3.21KGS	N	-	Y	-	-	< 5000
20	B/O SONIA	ELECTIVE LSCS	MORBIDLY OBESE,CPD	17/7/2013	M	1-7/10,5-8/10	3.5KGS	N	-	Y	-	-	5000 - 10000
21	B/O GEETHA	REPEAT ELECTIVE LSCS	PREV LSCS	19/7/2013	F	1-7/10,5-8/10	3.5KGS	N	-	N	-	-	< 5000
22	B/O PAVITHRA	ELECTIVE LSCS	METARNAL DESIRE	20/7.2013	F	1-8/10,5-9/10	3.47KGS	N	-	N	-	-	< 5000
23	B/O KAMALAKSHI	REPEAT ELECTIVE LSCS	PREV LSCS	7/8/2013	M	1-7/10,5-8/10	3.37KGS	N	-	N	-	-	< 5000
24	B/O RANJITHA	ELECTIVE LSCS	METARNAL DESIRE	13/8/2013	M	1-7/10,5-8/10	2.265KGS	Y	RES DIS	N	Y	5	> 10000
25	B/O SOWMYA	ELECTIVE LSCS	PREV LSCS,MATERNAL DESIRE	19/8/2013	F	1-7/10,5-8/10	2.5KGS	N	-	Y	-	-	5000 - 10000
26	B/O NAGAMANI	ELECTIVE LSCS	MATERNAL DESIRE	19/8/2013	M	1-7/10,5-8/10	2.95KGS	N	-	Y	-	-	< 5000
27	B/O PREETHI	ELECTIVE LSCS	K/C/O RHD	19/8/2013	F	1-7/10,5-8/10	2.34KGS	N	-	Y	-	-	>10000
28	B/O SUNITHA	ELECTIVE LSCS	MATERNAL DESIRE	29/8/2013	F	1-7/10,5-8/10	2.7KGS	N	-	N	-	-	<5000

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29	B/O ANUPAMA	ELECTIVE LSCS	CPD	30/8/2013	M	1-7/10,5-8/10	2.8KGS	Y	RES DIS	Y	2	-	5000 10000
30	B/O VYSHALI	ELECTIVE LSCS	CPD	30/8/2013	F	1-7/10,5-8/10	2.85KGS	N	-	N	-	-	5000 10000
31	B/O SHILPA	ELECTIVE LSCS	MATERNAL DESIRE	31/8/2013	M	1-7/10,5-8/10	2.92KGS	N	-	N	-	-	< 5000
32	B/O PRIYADARSHINI	REPEAT ELECTIVE LSCS	PREV LSCS	2/9/2013	M	1-6/10,5-9/10	3.7KGS	Y	RES DIS	Y	-	2	5000- 10000
33	B/O SUJATHA	VBAC	NIL	4/9/2013	M	1-3/10,5-9/10	2.2KGS	Y	BA	Y	-	2	5000 - 10000
34	B/O LAKSHMI	VBAC	NIL	8/9/2013	F	1-7/10,5-9/10	2.8KGS	N	-	N	-	-	< 5000
35	B/O SHILPA	VBAC	NIL	8/9/2013	F	1-5/10,5-7/10	2.8KGS	Y	RES DIS	Y	-	1	< 5000
36	B/O MEERA BAI	VBAC	NIL	10/9/2013	M	1-8/10,5-9/10	2.6KGS	N	-	Y	-	-	5000 - 10000
37	B/O MANJULA	VBAC	NIL	15/9/2013	M	1-7/10,5-9/10	2.36KGS	Y	HYPOGLYCEMIA	N	Y	2	5000 - 10000
38	B/O ANJANAMMA	VBAC	NIL	3/10/2013	M	1-7/10,5-9/10	2.8KGS	N	-	N	-		< 5000
39	B/O SIRISHA	VBAC	NIL	8/10/2013	F	1-7/10,5-8/10	3.04KGS	N	-	N	-		< 5000
40	B/O SUBHASHINI	VBAC	NIL	18/10/2013	F	1-6/10,5-8/10	1.3KGS	Y	LBWC+SPSIS	Y	Y	11	> 10000
41	B/OMANJU	ELECTIVE LSCS	CPD	18/10/2013	M	1-7/10,5-8/10	2.38KGS	N	-	Y	-		5000 - 10000
42	B/O MAHAMUDI	ELECTIVE LSCS	METARNAL DESIRE	19/10/2013	F	1-7/10,5-8/10	3KGS	Y	RES DIS	N	N	5	> 10000
43	B/O SHAMALA	ELECTIVE LSCS	CPD	1/11/2013	M	1-7/10,5-8/10	3.4KGS	Y	RES DIS	N	Y	6	> 10000
44	B/OANUGAMMA	REP ELEV LSCS	PREV LSCS	3/11/2013	M	1-7/10,5-9/10	2.5KGS	N	-	Y	-		< 5000
45	B/OSWAPNA	REP ELEV LSCS	PREV LSCS	5/11/2013	F	1-7/10,5-9/10	4KG	Y	RES DIS	N	N	2	5000 - 10000
46	B/OSHILPA	REP ELEV LSCS	PREV LSCS	12/11/2013	F	1-7/10,5-9/10	3.2KGS	N	-	Y	-		< 5000
47	B/O MALINI	VBAC	NIL	12/11/2013	F	1-7/10,5-9/10	3KGS	N	-	N	-		< 5000
48	B/O NAGAMANI	VBAC	NIL	14/11/2013	M	1-6/10,5-9/10	2.6KGS	N	-	N	-		< 5000
49	B/O SNEHALATA	VBAC	NIL	16/11/2013	F	1-7/10,5-9/10	2.8KGS	N	-	N	-		< 5000
50	B/O MANJULA	REP ELEV LSCS	PREV LSCS+ RES DISTR	2/12/2013	F	1-7/10,5-9/10	3.8KGS	Y	RES DIS	N	Y	2	5000 - 10000
51	B/O NAZIYA	REP ELEV LSCS	PREV LSCS	4/12/2013	M	1-7/10,5-9/10	2.35KGS	Y	LOW APGAR	N	N	7	> 10000
52	B/O DIVYA	REP ELEV LSCS	PREV LSCS	6/12/2013	M	1-7/10,5-8/10	3.16KGS	N	-	N	-	-	< 5000
53	B/O SUJANA	REP ELEV LSCS	PREV LSCS	10/12/2013	F	1-8/10,5-9/10	2.6KGS	N	-	N	-	-	< 5000
54	B/O LAKSHMI	REP ELEV LSCS	PREV LSCS	18/12/2013	M	1-9/10,5-9/10	2.7KGS	N	-	N	-	-	< 5000
55	B/O BASANTHI	REP ELEV LSCS	PREV LSCS	19/12/2013	M	1-8/10,5-9/10	3.21KGS	Y	RES DIS	N	Y	4	> 10000
56	B/O SWAPNA	REP ELEV LSCS	PREV LSCS	20/12/2013	F	1-7/10,5-9/10	2.8KGS	N	-	N	Y		5000 - 10000
57	B/O DEEPA	VBAC	NIL	20/12/2013	F	1-7/10,5-9/10	2.8KGS	N	-	N	-	-	< 5000
58	B/O SHILPA	VBAC	NIL	22/12/2013	M	1-7/10,5-9/10	2.7KGS	N	-	Y	Y		< 5000
59	B/O ROOPA	VBAC	NIL	22/12/2013	F	1-7/10,5-9/10	2.6KGS	N	-	N	-		< 5000
60	B/O NAZEEMA	VBAC	NIL	9/1/2013	F	1-3/10,5-9/10	3.46KGS	Y	LOW APG+RES DIS	N	Y	5	> 10000
61	B/O VIJAYALAKSHMI	REP ELEV LSCS	PREV LSCS	10/1/2013	M	1-7/10,5-9/10	3.3KGS	N	-	N	Y		5000 - 10000
62	B/O ANITHA	REP ELEV LSCS	PREV LSCS+METARNAL DES	20/1/2013	F	1-7/10,5-9/10	2.84KGS	Y	RES DIS	N	N	3	> 10000

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63	B/O LAKSHMIDEVI	VBAC	NIL	27/1/2013	M	1-3/10,5-9/10	2.4KGS	Y	LOW APGAR+RES DIS	Y	Y	3	5000 - 10000
64	B/O SAVITHA	VBAC	NIL	30/1/2013	F	1-3/10,5-9/10	2.17KGS	Y	LBW	N	Y	5	> 10000
65	B/O JANAKI	VBAC	NIL	26/2/2014	M	1-7/10,5-9/10	2.5KGS	N	-	Y	-	-	< 5000
66	B/O MANJULA	VBAC	NIL	25/3/2014	F	1-7/10,5-9/10	3.2KGS	N	-	Y	-	-	< 5000