A dissertation on

ANALYTICAL STUDY OF ROBSON CLASSIFICATION AFTER ITS IMPLEMENTATION IN A TERTIARY CARE HOSPITAL

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DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY

COIMBATORE MEDICAL COLLEGE HOSPITAL,

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CERTIFICATE

This is to certify that the dissertation entitled "**ANALYTICAL STUDY OF ROBSON CLASSIFICATION AFTER ITS IMPLEMENTATION IN A TERTIARY ARE HOSPITAL"** is a bonafide and genuine research work carried out by **Dr.K.SIVARANJANI** in partial fulfilment of the requirement for the degree of Master of Surgery in Department of Obstetrics & Gynaecology.

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DECLARATION

The dissertation titled **"ANALYTICAL STUDY OF ROBSON CLASSIFICATION AFTER ITS IMPLEMENTATION IN A TERTIARY CARE HOSPITAL"** is being submitted by me to "The Tamil Nadu Dr. M.G.R. Medical University" in partial fulfillment of the regulation for the completion of the Master of Surgery in Department of Obstetrics & Gynaecology Degree Examination to be held in 2022. This work has been carried out in the Department of Obstetrics & Gynaecology, Coimbatore Medical College and Hospital, Coimbatore under the guidance of **DR.N.GEETHA M.D (OG)**, Associate Professor, Department of Obstetrics & Gynaecology, Coimbatore Medical College & Hospital, Coimbatore.

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CERTIFICATE – II

This is to certify that this dissertation work titled **"ANALYTICAL STUDY OF ROBSON CLASSIFICATION AFTER ITS IMPLEMENTATION IN A TERTIARY CARE HOSPITAL"** of the candidate **Dr. K. SIVARANJANI** with registration Number **221816307** for the award of Master of Surgery in Department of Obstetrics & Gynaecology, I personally verified the urkund.com website for the purpose of plagiarism Check. I found that the uploaded thesis file contains 76 pages from introduction to conclusion and the result shows **17% (Seventeen Percentage)** of plagiarism in the dissertation.

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ACKNOWLEDGEMENT

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Dr.K.SIVARANJANI

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Dear **Dr.Sivaranjani K**

The Institutional Ethics Committee of Coimbatore Medical College, reviewed and discussed your application for approval of the proposal entitled **"Analytical Study of Robson Classification after its Implementation in a Tertiary Care Hospital."**No.0220/2019.

The following members of Ethics Committee were present in the meeting held on 31.01.2019.conducted at MEU Hall, Coimbatore Medical College Hospital Coimbatore-18

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12	Mr.V.A.Shahul Hameed, +2	Lay-Person

We approve the Proposal to be conducted in its presented form.

Sd/Member Secretary & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

Chairman, Ethics Committee

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LIST OF ABBREVIATIONS

CS	-	Caesarean Section
CTG	-	Cardiotocography
CSR	-	Caesarean Section Rates
TGCS	-	Ten Group Classification System
TOLAC	-	Trial Of Labour After Caesarean
VBAC	-	Vaginal Birth After Caesarean
WHO	-	World Health Organisation

INTRODUCTION

It is a well acknowledged fact that the caesarean section rates have continued to increase worldwide and the rate of increase is highest in low income countries . The worldwide rise in CS is a major public health concern and cause of considerable debate due to potential maternal and perinatal risks, cost issues and inequity in access. An increase in the use of CS particularly in the public sector and in low-resource settings may notably affect health services by not only increased rates of maternal / neonatal complications but also in economic terms . It has been noted that no agreement has been reached on an appropriate caesarean section rate. However, WHO and the US Healthy People 2000 initiative, suggested 10-15% as the optimal caesarean section rate. It is however difficult to determine optimal rates for institutions, especially referral centers. Setting up optimal rates needs to consider the possibility of unmet need for caesarean sections as well.

It has been suggested that caesarean section rates should no longer be thought has been too high or too low but rather whether they are appropriate or not, after taking into consideration all relevant information. To capture all relevant information the Robson criteria with various

modifications have been put forward and been used in many centers worldwide. The Robson classification system allows reflection, research at local, regional and national levels to better guide future care. The Robson criteria is a ten group classification system using 10 mutually exclusive and totally inclusive categories for caesarean section i.e. all women can only be classified into only one group.

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The Robson classification system allows reflection, research at local,regional and national levels to better guide future care and the modified versions enable comparisons of rate and indications as well.

The Robson criteria is a ten group classification system (RTGCS) using 10 mutually exclusive and totally inclusive categories for caesarean section i.e. all women can only be classified into only one group.

AIM AND OBJECTIVES

Aim of our study is to analyze the rates of cesarean section after the implementation of Robson classification of cesarean section in tertiary care hospital and to bring out the pros and cons of its implementation and analyse how to reduce the cesarean section rates.

When medically justified, a caesarean section can effectively prevent maternal and perinatal mortality and morbidity. However , there is no evidence showing the benefits of caesarean delivery for women or infants who do not require the procedure . In recent years, governments and clinicians have expressed concern about the rise in the numbers of caesarean section births and the potential negative consequences for maternal and infant health. Hence there is a need to provide a description of how Robson's criteria give an implication of decreasing caesarean rate.

REVIEW OF LITERATURE

A retrospective study was conducted in Korle-Bu Teaching Hospital, Accra , Ghana where Groups 2, 4 and 5 were found to be the major contributors to the overall caesarean section rates and the modifiable factors for consideration in reducing caesarean section rates would be to improve the number of successful inductions of labour. This will decrease primary caesarean section rates, and decrease the numbers for trial of labour after caesarean section (TOLAC). TOLAC should be offered as per protocols and not left to individual obstetrician discretion.

A retrospective study was conducted in Medical College, Baroda for a period of 10 yrs with the departmental records. The TGCS was easily applied in this large dataset of 40,086 deliveries. The 10-year overall cesarean section rate (CSR) was 25.17 %. Groups 1 and 3 represented 60 % of the total obstetric population. The largest contributions to the total CSR are group 1 (37.62 %) and group 5 (17.06 %). Group 3 which was the second largest group contributed 15 % to the overall CSR. Group 2 and group 4 had high group CSRs of 47.28 and 34.74 % respectively, although the total group size was small (n =

1375;3.43 %). Maternal age and presentation were found to have an independent association with mode of delivery on logistic regression.

Use of the Robson classification to assess caesarean section trends in 21 countries: a secondary analysis of two WHO multicountry survey was done. The caesarean section rate increased overall between the two surveys (from 26·4% in the WHOGS to 31·2% in the WHOMCS, p=0·003) and in all countries except Japan. Use of obstetric interventions (induction, prelabour caesarean section, and overall caesarean section) increased over time. Caesarean section rates increased across most Robson groups in all HDI categories. Use of induction and prelabour caesarean section increased in very high/high and low HDI countries, and the caesarean section rate after induction in multiparous women increased signifi cantly across all HDI groups. The proportion of women who had previously had a caesarean section increased in moderate and low HDI countries, as did the caesarean section rate in these women.

A literature study by selected information from journal that has been published in safety sites and selected based on the implementation of Robson's criteria in caesarean intervention was done in University of Indonesia. Robson's criteria becomes an useful tool to monitoring cesarean section in low human development index countries , but the

implementation should have other modification based on health care providers and health policy globally. Ideally, assessment of obstetric interventions and outcomes should be based on high-quality but the implementation should have other modification based on healthcare providers and health policy globally.

A Systematic Review of the Robson Classification for Caesarean Section: What Works, Doesn't Work and How to Improve It. : Caesarean sections (CS) rates continue to increase worldwide without a clear understanding of the main drivers and consequences. The lack of a standardized internationally-accepted classification system to monitor and compare CS rates is one of the barriers to a better understanding of this trend. The Robson's 10-group classification is based on simple obstetrical parameters (parity, previous CS, gestational age, onset of labour, fetal presentation and number of fetuses) and does not involve the indication for CS. This classification has become very popular over the last years in many countries. We conducted a systematic review to synthesize the experience of users on the implementation of this classification and proposed adaptations. Methods: Four electronic databases were searched. A three-step thematic synthesis approach and a qualitative metasummary method were used. Results: 232 unique reports were identified, 97 were

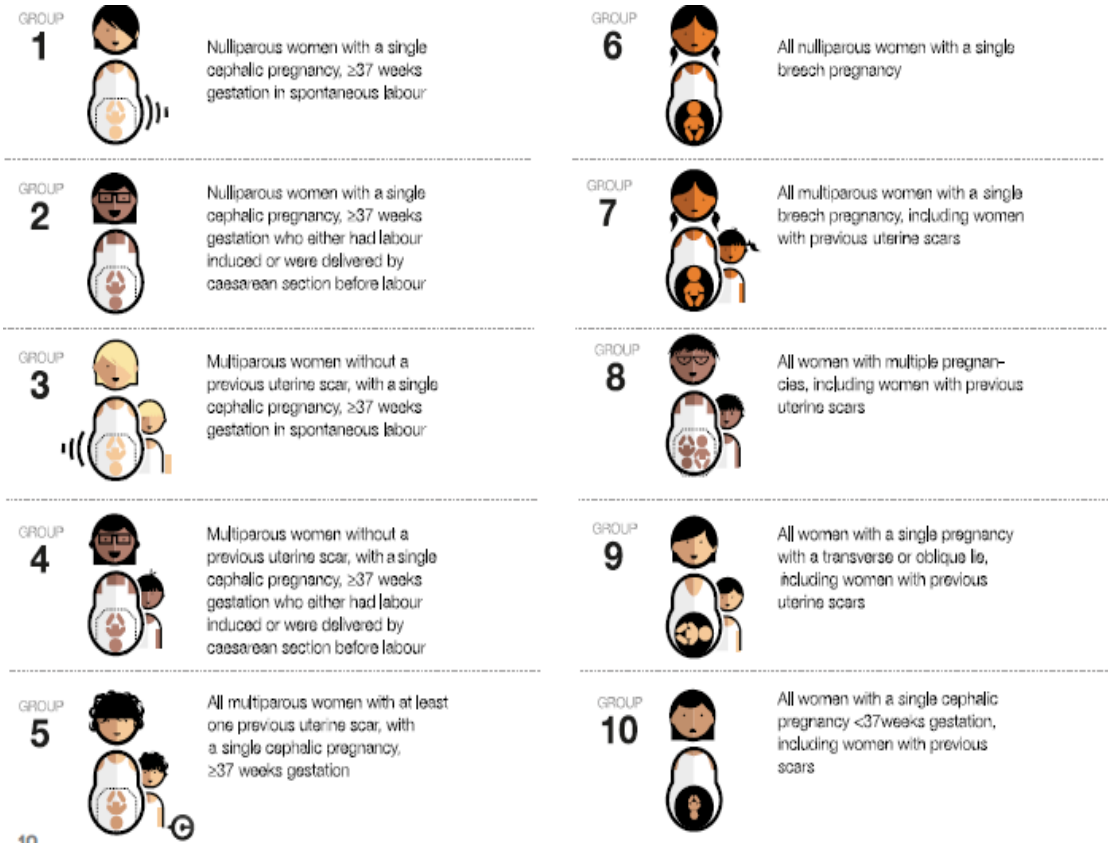
selected for full-text evaluation and 73 were included. These publications reported on the use of Robson's classification in over 33 million women from 31 countries. According to users, the main strengths of the classification are its simplicity, robustness, reliability and flexibility. However, missing data, misclassification of women and lack of definition or consensus on core variables of the classification are challenges. To improve the classification for local use and to decrease heterogeneity within groups, several subdivisions in each of the 10 groups have been proposed. Group 5 (women with previous CS) received the largest number of suggestions. Conclusions: The use of the Robson classification is increasing rapidly and spontaneously worldwide. Despite some limitations, this classification is easy to implement and interpret. Several suggested modifications could be useful to help facilities and countries as they work towards its implementation.

The ten group Robson classification: a retrospective study to identify strategies to optimise caesarean section rates. Current retrospective study was conducted in the department of obstetrics and gynaecology in a tertiary care hospital. The medical records were reviewed for a period of 12 months.**:** Total number of deliveries during the study period was 315. The total numbers of caesarean section were

159 and total vaginal deliveries were 156. The caesarean section rate was 50.47%. The main contributors to overall caesarean section rate were group 5 (18.10%), group 2 (13.96%) and group 1 (5.71%). Women with one previous LSCS contributed majorly to the caesarean section rate. Higher CS rate was also seen in both group 2A (69.40%) and group 4A (47.30%) which had underwent induction of labour. More inclination towards trial of labour following CS for women with previous one LSCS can lower CS rates. Modified Robson's classification is easily implementable and an effective tool for ongoing surveillance. The results can be compared between Institutions, states and countries. Having implemented the Robson classification and identified groups which contributed the most to the overall CS rate, interventions to reduce the same has to be our prime objective.

ROBSON CLASSIFICATION

The 10-Groups classification (also known as the "TGCS-Ten Groups Classification System" or the "Robson Classification") was created to prospectively identify well-defined, clinically relevant groups of women admitted for delivery and to investigate differences in CS rates within these relatively homogeneous groups of women.



Unlike classifications based on indications for CS, the Robson Classification is for “all women” who deliver at a specific setting (e.g. a maternity or a region) and not only for the women who deliver by CS. It is a complete perinatal classification.

Since this system can be used prospectively and its categories are totally inclusive and mutually exclusive, every woman who is admitted for delivery can be immediately classified, based on a few basic characteristics which are usually routinely collected by obstetric care

providers worldwide. The classification is simple, robust, reproducible, clinically relevant, and prospective. It allows the comparison and analysis of CS rates within and across these groups of women. Even before official endorsement by an international institution or formal guidelines recommending its use in 2015, the Robson Classification had been rapidly and increasingly used by many countries all over the world. In 2014 WHO conducted another systematic review to gather the experience of the users of the Robson Classification, to assess the pros and cons of its adoption, implementation and interpretation, and to identify barriers, facilitators and potential adaptations .

WHO expects that the use of the Robson Classification will help health care facilities to:

- Identify and analyze the groups of women which contribute most and least to overall CS rates.
- Compare practice in these groups of women with other units who have more desirable results and consider changes in practice.
- Assess the effectiveness of strategies or interventions targeted at optimizing the use of CS.
- Assess the quality of care and of clinical management practices by analyzing outcomes by groups of women.
- Assess the quality of the data collected and raise staff awareness about the importance of this data, interpretation and use.

Table 1 : Obstetric variables for the Robson Classification

Parity	• Nullipara • Multipara
Previous CS	• Yes (one or more) • No
Onset of Labour	• Spontaneous • Induced • No labour(pre-labourCS)
Number of foetuses	• Singleton • Multiple
Gestational age	• Preterm (less than 37 weeks) • Term (37 weeks or more)
Fetal lie and presentation	• Cephalic presentation • Breech presentation • Transverse lie

Table 2 :Definition of core variables used in the Robson Classification

Obstetric Variable	**Definition**	**Observation**
Parity	Number of previous deliveries upon admission for delivery.	Birth of infant weighing ≥ 500 g or ≥ 22 weeks, alive or dead, with or without malformations, by any route. The number of previous abortions/ miscarriages does not count.
Nullipara	No previous delivery.	This is not necessarily equivalent to Primigravida. For example, a woman in her 4thpregnancy with 3 prior miscarriages (G4 P0 A3) will be a nulliparous woman and belongs in this group.
Multipara	At least one previous delivery.	Delivery of infant weighing ≥ 500 g or ≥ 22 weeks, alive or dead, with or without malformations, by any route.
Previous CS	Number of previous CS upon admission for delivery.	Other types of uterine scars (e.g. myomectomy) should not be considered and not included as a prior CS when classifying women.

None	All previous deliveries were vaginal.	
One or more	At least one previous delivery by CS but may have one or more vaginal deliveries in addition.	
Onset Of Labour	How labour and delivery started in the current pregnancy, regardless of how delivery was planned originally.	This should be based on the history, physical examination and decision by health professional upon admission to the labour/delivery ward.
Spontaneous	Prior to delivery, the woman was in spontaneous labour .	Nulliparous or multiparous women with a scheduled (prelabour) CS who arrive in spontaneous labour belong to this group. This group also includes women who entered labour spontaneously and then received oxytocin or had an amniotomy performed for augmentation (acceleration) of labour.

Induced	Upon admission to the labour ward, the woman was not in labour and was then induced.	Any method of induction is valid including amniotomy, misoprostol, oxytocin, intracervical Foley balloon, laminaria or other. Women who enter labour spontaneously and then receive oxytocin or have an amniotomy to correct dystocias or augment (accelerate) labour do not belong in this group but should be classified as "Spontaneous" onset of labour.
Pre-Labour CS	Woman not in labour when admitted for delivery and a decision was taken to deliver by CS.	Cases of induction or spontaneous labour who ultimately were delivered by CS do not belong here .
Number Of Fetuses	Number of fetuses upon admission for delivery.	Including fetal deaths diagnosed after 22 weeks or 500 g.
Singleton	One fetus.	Twin pregnancies with fetal demise prior to 22 weeks or 500 g should be counted as a singleton pregnancy
Multiple	More than one fetus.	Including cases of multiples where one or more fetuses died after 22 weeks or 500 g.

Gestational age	Gestational age upon admission for current delivery.	Based on best estimate (menstrual or earliest ultrasound) or neonatal exam or definitions used in your setting.
Term	37 weeks or more.	
Preterm	Less than 37 weeks.	
Fetal lie and presentation	The final fetal lie/presentation before a decision for delivery or before a diagnosis of labour is made.	Women admitted with a breach fetus who undergo external version and then deliver a cephalic fetus should be considered as cephalic. Women with a dead fetus in transverse lie who undergo internal version before delivery should be considered breech.
Cephalic	Fetal head is the presenting part.	Vertex, face or brow, or compound head presentations (hand prolapse) should go here.
Breech	Fetal buttocks or one foot or two feet are the presenting part.	All types of breech (frank, complete and footling).

Table 3 : The Robson Classification with subdivisions

Group	Obstetric population
1	Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour
2	Nulliparous women with a single cephalic pregnancy, ≥37 weeks gestation who had labour induced or were delivered by CS before labour
2a	Labour induced
2b	Pre-labour CS
3	Multiparous women without a previous CS, with a single cephalic pregnancy, ≥37 weeks gestation in spontaneous labour
4	Multiparous women without a previous CS, with a single cephalic pregnancy, ≥37 weeks gestation who had labour induced or were delivered by CS before labour
4a	Labour induced
4b	Pre-labour CS
5	All multiparous women with at least one previous CS, with a single cephalic pregnancy, ≥37 weeks gestation
5.1	With one previous CS
5.2	With two or more previous CSs
6	All nulliparous women with a single breech pregnancy
7	All multiparous women with a single breech pregnancy including women with previous CS(s)
8	All women with multiple pregnancies including women with previous CS(s)
9	All women with a single pregnancy with a transverse or oblique lie, including women with previous CS(s)
10	All women with a single cephalic pregnancy < 37 weeks gestation, including women with previous CS(s)

Common subdivisions for the 10 groups

Groups 2 and 4 subdivisions:

These groups refer to nulliparous and multiparous women without previous CS, respectively, with a singleton, term fetus in cephalic presentation who did not enter labour spontaneously (See Table 3). These groups include two distinct and mutually exclusive subcategories, namely:

2a or 4a	**2b or 4b**
Nulliparous or multiparous women, respectively, who had their labour induced (using any method, such as misoprostol, oxytocin, amniotomy or intracervical Foley catheter or other) and went on to deliver vaginally or by CS	Nulliparous or multiparous women, respectively, who were admitted and delivered by pre-labour CS. Since all the women in these subgroups will have a CS, the rates of CS in these subgroups will always be 100%.

Since Groups 2 and 4 may represent a large proportion of the obstetric population in many hospitals, these subcategories are important to understand how differences in clinical practice (rates of induced labour

or pre-labour CS) contribute to the rates of CS in nulliparous and multiparous women without a previous CS, as well as the overall CS rates in different hospitals.

Additionally, the rate of CS in Subgroups 2a and 4a (induced nulliparous and multiparous women, respectively) can also be used to assess and compare the success of induction guidelines in different hospitals or in the same hospital over time.

Common subdivisions for the 10 groups

Group 5 subdivisions:

Group 5 includes all multiparous women with at least one previous CS carrying a singleton, term fetus in cephalic presentation. In current obstetric practice, Group 5 can be very important in many settings because there is a growing number of women with previous CS and therefore the size of this group may be quite significant. Since the rate of CS in this group is usually high, Group 5 may be an important contributor to the total number of CS in these settings. However, Group 5 includes two distinct and mutually exclusive subcategories, namely:

5.1 Multiparous women with only one previous CS

5.2 Multiparous women with two or more previous CS.

Given the differences in clinical management of these two types of women, these common subcategories should be reported separately in the classification, as 5.1 and 5.2.

The usefulness of these subcategories will depend on the actual size of Group 5 in a specific setting. In many high- and middle-income countries where the size of Group 5 is becoming substantial, the proposed subcategories will be more useful and appreciated than in places where Group 5 represents only a small proportion of the obstetric population.

Cases with missing variables (Unclassifiable Cases)

The 10 groups are based on basic obstetric characteristics that are routinely collected in most pregnancies at admission and on delivery. In cases where the information on one or more of the core variables is missing or illegible in the patient record, it will not be possible to classify the woman in any of the 10 groups. This "unclassifiable group" of women should be reported as part of the Robson Classification Report Table but preferably placed as a footnote at the bottom of this table.

It is very important to report this group and its size (absolute N and % over total deliveries) because it is an indicator of the quality of the data available in any hospital.

It is also important to explore which are the exact variables that are missing in this group of women, in order to improve future data collection.

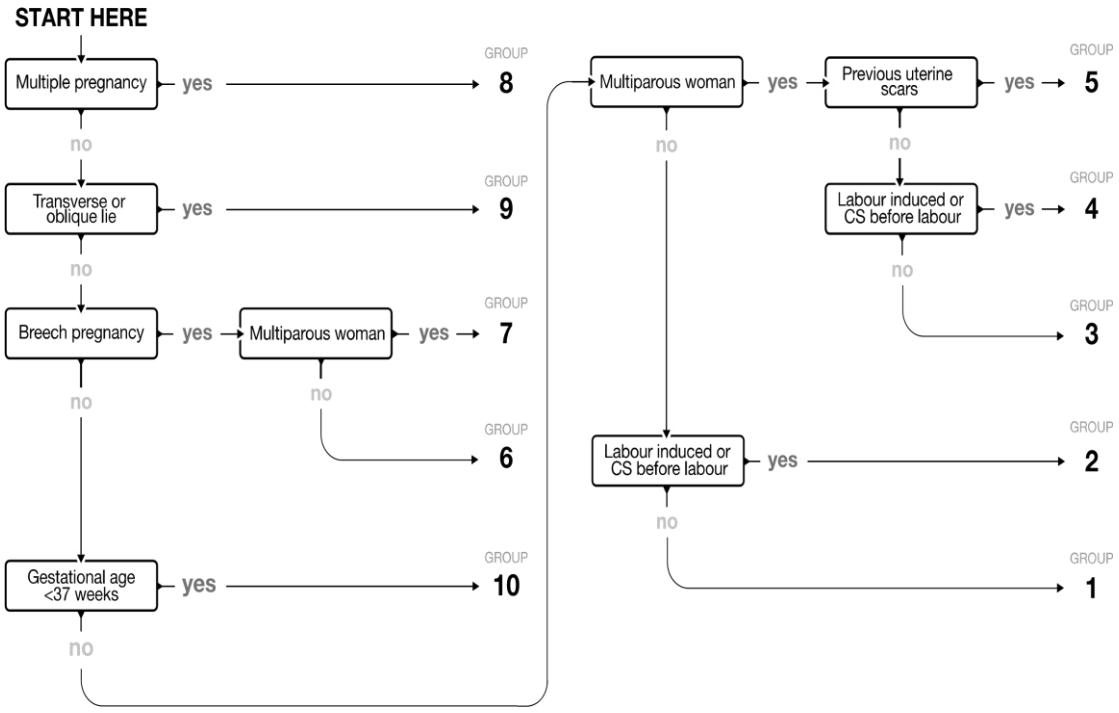
Usefulness of Quantifying And Exploring Unclassifiable Cases

In 2017, hospital A had a total of 2500 deliveries and 250 (10%) could not be classified in any of the Robson groups. Upon reviewing these specific records, it was seen that the missing information was mostly fetal presentation (n=200/250 cases). In this hospital, it will be relatively simple to reduce the number of "unclassifiable cases" by properly filling the information on fetal presentation, which is easily available in all patient records.

On the other hand, in hospital B, which has 7500 deliveries per year, there were 225 records that were unclassifiable (3%) and the most frequently missing variable was onset of labourand delivery (i.e. including pre-labourCS) (n=218/225 cases).

It would seem that the managers of hospital B will probably need to invest less efforts to improve data collection as the unclassifiable group is smaller than in hospital A. However, the information missing in Hospital B (onset of labourand delivery) is less objective than the information missing in Hospital A (fetal presentation). To reduce the number of unclassifiable cases due to missing information on labouronset, the clinicians could consider adding a new field in their admission forms to collect this specific information in all cases. For example at one point in the data collection prior of the delivery, all women must have one of the following three options collected: spontaneous labour, induced labouror pre-labourCS. The midwifery and obstetric staff would have to agree on the hospital´s definition of what constitutes spontaneous labourand ensure that all health care providers understand and implement this definition when filling this field.

Flow chart for the classification of women in the Robson Classification



Using a spreadsheet or an automatic calculator

Group	Parity	Previous CS	Number of fetuses	Fetal presentation or lie	Gestational age (weeks)	Onset of labour
1	0	No	1	Cephalic	≥ 37	Spontaneous
2	0	No	1	Cephalic	≥ 37	Induced or CS before labour
3	≥ 1	No	1	Cephalic	≥ 37	Spontaneous
4	≥ 1	No	1	Cephalic	≥ 37	Induced or CS before labour
5	≥ 1	Yes	1	Cephalic	≥ 37	Any
6	0	No	1	Breech	Any	Any
7	≥ 1	Any	1	Breech	Any	Any
8	Any	Any	≥ 2	Any	Any	Any
9	Any	Any	1	Transverse or Oblique	Any	Any
10	Any	Any	1	Cephalic	< 37	Any

GENERAL PRINCIPLES IN INDUCTION OF LABOUR

Induction of labour should be performed only when there is a clear medical indication for it and the expected benefits outweigh its potential harms.

In applying the recommendations, consideration must be given to the actual condition, wishes and preferences of each woman, with emphasis being placed on cervical status, the specific method of induction of labour and associated conditions such as parity and rupture of membranes.

Induction of labour should be performed with caution since the procedure carries the risk of uterine hyperstimulation and rupture and fetal distress.

Wherever induction of labour is carried out, facilities should be available for assessing maternal and fetal well-being.

Women receiving oxytocin, misoprostol or other prostaglandins should never be left unattended.

Failed induction of labour does not necessarily indicate caesarean section.

Wherever possible, induction of labour should be carried out in facilities where caesarean section can be performed.

FAILED INDUCTION OF LABOUR

Failed induction is defined as failure to achieve regular (e.g. every 3 min) uterine contractions and cervical change after at least 6–8 h of the maintenance dose of oxytocin administration, with artificial rupture of membranes. Artificial rupture of membranes is done for induction of labor with alive fetus. Artificial rupture of membranes is not done for induction of labor indicated with Intra-Uterine Fetal Death.

PRIMARY CAESAREAN SECTION

Childbirth by its very nature carries potential risks for the woman and her baby, regardless of the route of delivery. The National Institutes of Health has commissioned evidence-based reports over recent years to examine the risks and benefits of cesarean and vaginal delivery . For certain clinical conditions—such as placenta previa or uterine rupture—cesarean delivery is firmly established as the safest route of delivery. However, for most pregnancies, which are low-risk, cesarean delivery appears to pose greater risk of maternal morbidity and mortality than vaginal delivery .

It is difficult to isolate the morbidity caused specifically by route of delivery. For example, in one of the few randomized trials of approach to delivery, women with a breech presentation were randomized to undergo planned cesarean delivery or planned vaginal delivery, although there was crossover in both treatment arms. In this study, at 3-month follow-up, women were more likely to have urinary, but not fecal, incontinence if they had been randomized to the planned vaginal delivery group. However, this difference was no longer significant at 2-year follow-up. Because of the size of this randomized trial, it was not powered to look at other measures of maternal morbidity.

A large population-based study from Canada found that the risk of *severe maternal morbidities*—defined as hemorrhage that requires hysterectomy or transfusion, uterine rupture, anesthetic complications, shock, cardiac arrest, acute renal failure, assisted ventilation, venous thromboembolism, major infection, or in hospital wound disruption or hematoma—was increased threefold for cesarean delivery as compared with vaginal delivery (2.7% versus 0.9%, respectively). There also are concerns regarding the long-term risks associated with cesarean delivery, particularly those associated with subsequent pregnancies. The incidence of placental abnormalities, such as placenta previa, in future pregnancies

increases with each subsequent cesarean delivery, from 1% with one prior cesarean delivery to almost 3% with three or more prior cesarean deliveries. In addition, an increasing number of prior cesareans is associated with the morbidity of placental previa: after three cesarean deliveries, the risk that a placenta previa will be complicated by placenta accreta is nearly 40%. This combination of complications not only significantly increases maternal morbidity but also increases the risk of adverse neonatal outcomes, such as neonatal intensive care unit admission and perinatal death. Thus, although the initial cesarean delivery is associated with some increases in morbidity and mortality, the downstream effects are even greater because of the risks from repeat cesareans in future pregnancies.

In order to understand the degree to which cesarean deliveries may be preventable, it is important to know why cesareans are performed. In a 2011 population-based study, the most common indications for primary cesarean delivery included, in order of frequency, labor dystocia, abnormal or indeterminate (formerly, nonreassuring) fetal heart rate tracing, fetal malpresentation, multiple gestation, and suspected fetal macrosomia . Arrest of labor and abnormal or indeterminate fetal heart rate tracing accounted for more than one half of all primary cesarean

deliveries in the study population. Safe reduction of the rate of primary cesarean deliveries will require different approaches for each of these indications. For example, it may be necessary to revisit the definition of labor dystocia because recent data show that contemporary labor progresses at a rate substantially slower than what has been historically taught. Improved and standardized fetal heart rate interpretation and management also may have an effect. Increasing women's access to nonmedical interventions during labor, such as continuous labor support, also has been shown to reduce cesarean birth rates. External cephalic version for breech presentation and a trial of labor for women with twin gestations when the first twin is in cephalic presentation also can contribute to the safe lowering of the primary cesaDefinition of Abnormal First-Stage Labor

The first stage of labor has been historically divided into the latent phase and the active phase based on the work by Friedman in the 1950s and beyond. The *latent phase of labor* is defined as beginning with maternal perception of regular contractions. On the basis of the 95th percentile threshold, historically, the latent phase has been defined as prolonged when it exceeds 20 hours in nulliparous women and 14 hours in multiparous women. The *active phase of labor* has been defined as the

point at which the rate of change of cervical dilation significantly increases.

Active phase labor abnormalities can be categorized either as protraction disorders (slower progress than normal) or arrest disorders (complete cessation of progress). Based on Friedman's work, the traditional definition of a protracted active phase (based on the 95th percentile) has been cervical dilatation in the active phase of less than 1.2 cm/h for nulliparous women and less than 1.5 cm/h for multiparous women. *Active phase arrest* traditionally has been defined as the absence of cervical change for 2 hours or more in the presence of adequate uterine contractions and cervical dilation of at least 4 cm.

However, more recent data from the Consortium on Safe Labor have been used to revise the definition of contemporary normal labor progress. In this retrospective study conducted at 19 U.S. hospitals, the duration of labor was analyzed in 62,415 parturient women, each of whom delivered a singleton vertex fetus vaginally and had a normal perinatal outcome. In this study, the 95th percentile rate of active phase dilation was substantially slower than the standard rate derived from Friedman's work, varying from 0.5 cm/h to 0.7 cm/h for nulliparous

women and from 0.5 cm/h to 1.3 cm/h for multiparous women (the ranges reflect that at more advanced dilation, labor proceeded more quickly)

The Consortium on Safe Labor data highlight two important features of contemporary labor progress . First, from 4–6 cm, nulliparous and multiparous women dilated at essentially the same rate, and more slowly than historically described. Beyond 6 cm, multiparous women dilated more rapidly. Second, the maximal slope in the rate of change of cervical dilation over time (ie, the active phase) often did not start until at least 6 cm. The Consortium on Safe Labor data do not directly address an optimal duration for the diagnosis of active phase protraction or labor arrest, but do suggest that neither should be diagnosed before 6 cm of dilation. Because they are contemporary and robust, it seems that the Consortium on Safe Labor data, rather than the standards proposed by Friedman, should inform evidence-based labor management.

Management of Abnormal First-Stage Labor

Although labor management strategies predicated on the recent Consortium on Safe Labor information have not been assessed yet, some insight into how management of abnormal first-stage labor might be optimized can be deduced from prior studies.

The definitions of a prolonged latent phase are still based on data from Friedman and modern investigators have not particularly focused on the latent phase of labor. Most women with a prolonged latent phase ultimately will enter the active phase with expectant management. With few exceptions, the remainder either will cease contracting or, with amniotomy or oxytocin (or both), achieve the active phase. Thus, a prolonged latent phase (eg, greater than 20 hours in nulliparous women and greater than 14 hours in multiparous women) should not be an indication for cesarean delivery.

When the first stage of labor is protracted or arrested, oxytocin is commonly recommended. Several studies have evaluated the optimal duration of oxytocin augmentation in the face of labor protraction or arrest. A prospective study of the progress of labor in 220 nulliparous women and 99 multiparous women who spontaneously entered labor evaluated the benefit of prolonging oxytocin augmentation for an additional 4 hours (for a total of 8 hours) in patients who were dilated at least 3 cm and had unsatisfactory progress (either protraction or arrest) after an initial 4-hour augmentation period 21. The researchers found that of women who received at least 4 additional hours of oxytocin, 38% delivered vaginally, and none had neonates with 5-minute Apgar scores

of less than 6. In nulliparous women, a period of 8 hours of augmentation resulted in an 18% cesarean delivery rate and no cases of birth injury or asphyxia, whereas if the period of augmentation had been limited to 4 hours, the cesarean delivery rate would have been twice as high given the number of women who had not made significant progress at 4 hours. Thus, slow but progressive labor in the first stage

Definition of Arrest of Labor in the First Stage

Spontaneous labor: More than or equal to 6 cm dilation with membrane rupture and one of the following:

- 4 hours or more of adequate contractions (eg, more than 200 Montevideo units)
- 6 hours or more of inadequate contractions and no cervical change of labor should not be an indication for cesarean delivery.

MANAGEMENT OF ABNORMAL SECOND STAGE OF LABOUR

Given the available literature, before diagnosing arrest of labor in the second stage and if the maternal and fetal conditions permit, at least 2 hours of pushing in multiparous women and at least 3 hours of pushing in nulliparous women should be allowed . Longer durations may be appropriate on an individualized basis (eg, with the use of epidural analgesia or with fetal malposition) as long as progress is being documented . For example, the recent *Eunice Kennedy Shriver* National Institute of Child Health and Human Development document suggested allowing one additional hour in the setting of an epidural, thus, at least 3 hours in multiparous women and 4 hours in nulliparous women be used to diagnose second-stage arrest, although that document did not clarify between pushing time or total second stage.

In addition to greater expectant management of the second stage, two other practices could potentially reduce cesarean deliveries in the second stage: 1) operative vaginal delivery and 2) manual rotation of the fetal occiput for malposition

Despite much discussion of the increase in elective caesarean rates over the past 20 years,[1] [w1] little attention has been paid to the rise in second stage caesarean section rates. The maternal risks of second stage caesareans include major haemorrhage, longer hospital stay, greater risk of bladder trauma, and extension tears of the uterine angle leading to broad ligament haematoma.[2] Although second stage caesarean section is sometimes appropriate, many could be prevented by the attendance of a more skilled obstetrician.

Currently, obstetric trainees perform most of the second stage trials of instrumental delivery. A recent UK study found that decisions made by consultant obstetric staff are important in determining whether a second stage caesarean section is the optimum method of delivery for women with delay in advanced labour.[3] The investigators found substantial differences between consultants' and specialist registrars' opinions on factors affecting safe vaginal delivery—such as position of the fetal head in the maternal pelvis and its proximity to the pelvic outlet. Consequently, a consultant obstetrician who performed a vaginal assessment was more likely to reverse a decision made by an obstetric trainee for a caesarean and proceed to a safely conducted instrumental delivery.

From the women's perspective, receiving a senior opinion might make their labour worth while, in that they have a successful vaginal birth, and their delivery and reproductive future safer. Without increases in junior doctors' experience and recruitment into the specialty, the problems with second stage caesareans will rise. Furthermore, women who have undergone a caesarean section are less likely to have a vaginal birth in subsequent pregnancies because they tend to request repeat elective caesarean delivery.[4] Repeat and recurrent caesareans are associated with higher rates of placenta praevia and accreta

INTERVENTIONS FOR ABNORMAL FETAL HEART RATE TRACING

The second most common indication for primary cesarean is an abnormal or indeterminate fetal heart rate tracing. Given the known variation in interpretation and management of fetal heart rate tracings, a standardized approach is a logical potential goal for interventions to safely reduce the cesarean delivery rate.

Category III fetal heart rate tracings are abnormal and require intervention. The elements of Category III patterns which include either absent fetal heart rate variability with recurrent late decelerations,

recurrent variable decelerations, or bradycardia; or a sinus oidal rhythm have been associated with abnormal neonatal arterial umbilical cord pH, encephalopathy, and cerebral palsy. Intrauterine resuscitative efforts including maternal repositioning and oxygen supplementation, assessment for hypotension and tachysystole that may be corrected, and evaluation for other causes, such as umbilical cord prolapse should be performed expeditiously; however, when such efforts do not quickly resolve the Category III tracing, delivery as rapidly and as safely possible is indicated. The American College of Obstetricians and Gynecologists recommends preparations for imminent delivery in the event that intrauterine resuscitative measures do not improve the fetal heart rate pattern .

In contrast, Category I fetal heart tracings are normal and do not require intervention other than on going assessment with continuous or intermittent monitoring, given that patterns can change over time. Moderate variability and the presence of accelerations, which are features of Category I patterns, have proved to be reliable indicators of normal neonatal umbilical cord arterial pH (7.20 or greater).

Most intrapartum fetal heart rate tracings are Category II. Category II tracings are indeterminate and comprise a diverse spectrum of fetal

heart rate patterns that require evaluation, continued surveillance, initiation of appropriate corrective measures when indicated, and re-evaluation. Based on the high rate of first cesarean deliveries performed for the indication of "nonreassuring fetal heart rate" (also known as an "abnormal or indeterminate fetal heart rate") and the rarity of Category III patterns, it can be deduced that Category II tracings likely account for most cesarean deliveries performed for nonreassuring fetal status. Thus, one important consideration for health care providers who are making the diagnosis of nonreassuring fetal status with the intent to proceed with cesarean delivery is to ensure that clinically indicated measures have been undertaken to resolve the concerning elements of the Category II tracing or provide reassurance of fetal well-being.

Fetal Malpresentation

Breech presentation at 37 weeks of gestation and beyond is estimated to complicate 3.8% of pregnancies, and more than 85% of pregnant women with a persistent breech presentation are delivered by cesarean. In one recent study, the rate of attempted external cephalic version was 46% and decreased during the study period. Thus, external cephalic version for fetal malpresentation is likely underutilized, especially when considering that most patients with a successful external

cephalic version will give birth vaginally. Obstetricians should offer and perform external cephalic version whenever possible. Furthermore, when an external cephalic version is planned, there is evidence that success may be enhanced by regional analgesia. Fetal presentation should be assessed and documented beginning at 36 0/7 weeks of gestation to allow for external cephalic version to be offered. Before a vaginal breech delivery is planned, women should be informed that the risk of perinatal or neonatal mortality or short-term serious neonatal morbidity may be higher than if a cesarean delivery is planned, and the patient's informed consent should be documented.

Suspected Fetal Macrosomia

Suspected fetal macrosomia is not an indication for delivery and rarely is an indication for cesarean delivery. To avoid potential birth trauma, the College recommends that cesarean delivery be limited to estimated fetal weights of at least 5,000 g in women without diabetes and at least 4,500 g in women with diabetes . This recommendation is based on estimations of the number needed to treat from a study that modeled the potential risks and benefits from a scheduled, nonmedically indicated cesarean delivery for suspected fetal macrosomia, including shoulder dystocias and permanent brachial plexus injuries. The prevalence of birth

weight of 5,000 g or more is rare, and patients should be counseled that estimates of fetal weight, particularly late in gestation, are imprecise . Even when these thresholds are not reached, screening ultrasonography performed late in pregnancy has been associated with the unintended consequence of increased cesarean delivery with no evidence of neonatal benefit . Thus, ultrasonography for estimated fetal weight in the third trimester should be used sparingly and with clear indications.

Excessive Maternal Weight Gain

A large proportion of women in the United States gain more weight during pregnancy than is recommended by the Institute of Medicine (IOM). Observational evidence suggests that women who gain more weight than recommended by the IOM guidelines have an increased risk of cesarean delivery and other adverse outcomes . In a recent Committee Opinion, the College recommends that it is "important to discuss appropriate weight gain, diet, and exercise at the initial visit and periodically throughout the pregnancy". Although pregnancy weight-management interventions continue to be developed and have yet to translate into reduced rates of cesarean delivery or morbidity, the available observational data support that women should be counseled

about the IOM maternal weight guidelines in an attempt to avoid excessive weight gain.

Twin Gestation

The rate of cesarean deliveries among women with twin gestations increased from 53% in 1995 to 75% in 2008. Even among vertex-presenting twins, there was an increase from 45% to 68%. Perinatal outcomes for twin gestations in which the first twin is in cephalic presentation are not improved by cesarean delivery. Thus, women with either cephalic/cephalic-presenting twins or cephalic/noncephalic-presenting twins should be counseled to attempt vaginal delivery. In order to ensure safe vaginal delivery of twins, it is important to train residents to perform twin deliveries and to maintain experience with twin vaginal deliveries among practicing obstetric care providers.

METHODS OF INDUCTION OF LABOUR

Induction of Labor with a favorable cervix

OXYTOCIN

- Intravenous oxytocin is the most commonly used method of induction for women with a favorable cervix (Modified Bishop Score >6).

- Oxytocin can be used alone, in combination with amniotomy, or following cervical ripening. It can be used for induction as well as augmentation of labor.

It should be used with caution in women with previous cesarean delivery and grand multiparous women because of the risk of uterine rupture.

- Intravenous oxytocin and amniotomy is most likely to achieve vaginal delivery in 24 hours.

- Oxytocin should be administered intravenously as a infusion to allow continuous, precise control of the dose administered.

- The low-dose regimen begins with 1 to 2 mU/min, increased incrementally by 1 to 2 mU at every 30 minute intervals.

- The high-dose regimen starts with 4 to 6 mU/min with dose increments of 4 to 6 mU/min every 15 to 30 minutes.

- High dose protocols reduce the induction delivery interval and are associated with higher rates of tachysystole than low dose protocols. Maternal and fetal complication rates are similar with both protocols.

- Infusion of oxytocin should be documented in mU/minute or drops/min with the dilution being mentioned.

- The oxytocin infusion can be increased until labor progress is normal or uterine activity reaches 200 to 250 Montevideo units (ie, good regular uterine contractions, each lasting for 40-45 seconds duration and minimum of 3 contractions in 10 minutes).

- Upper limit of the oxytocin infusion during labor with a live fetus in the third trimester is 40 mU/minute.

- Monitoring for infusion rate of oxytocin and uterine contractions and fetal heart rate by continuous cardiotocography is preferable.

- In facilities where cardiotocography is not available, fetal monitoring should be done by intermittent auscultation every 15 min in first stage and 5 minutes in second stage.

- Blood pressure and pulse should be assessed every hour. Intake and output should be assessed every 4 hours. The frequency, intensity and duration of uterine contractions should be assessed every 30 minutes and with each incremental increase in oxytocin.

- Cervical status should be assessed prior to administration of oxytocin and repeated after at least four hours of moderate contractions.

- A vaginal examination may also be repeated in situation of a nonreassuring fetal heart pattern to rule out the presence of meconium, abruption or a cord accident.

- Close watch is kept for clinical features of maternal hyponatremia, uterine hyperstimulation and uterine rupture. Preparation of oxytocin infusion & dose calculation.

- Oxytocin is administered as dilute solution by intravenous route. Isotonic solutions such as ringer lactate or normal saline are

preferred over dextrose solution for fluid selection to minimize the risk of electrolyte imbalance (eg. hyponatremia) and volume overload.

- Each ampoule (1 ml) of oxytocin contains 5 units.

- Two ml of oxytocin (two ampoules) is taken in a 10 ml syringe and diluted with 8 ml of normal saline. It makes 10 ml of saline solution having 10 units of oxytocin. One ml of this saline solution contains 1unit of oxytocin. To make a bottle of 2 units of oxytocin infusion, 2 ml of this solution is added in 500 ml of Ringer Lactate.

AMNIOTOMY

- A simple and effective method when the membranes are accessible and the cervix is favorable. It creates a commitment to delivery.

- Flow of amniotic fluid should be controlled with vaginal fingers. The liquor should be drained slowly because sudden decompression of uterus can lead to placenta abruption.

- Care should be taken when amniotomy is done in unengaged presentation because there is a risk of cord prolapse. The vaginal

fingers should not be removed until presenting part rests against the cervix.

- Amount and color (meconium or blood stained) of the liquor is observed.
- Monitoring of fetal heart should be done during and after the procedure
- Amniotomy alone is not recommended for induction of labor.
- Oxytocin should be commenced immediately after amniotomy or after two hours depending on the intensity of uterine contractions.

Monitoring during induction of labor

- Maternal and fetal monitoring is a must.
- Before induction of labor, a nonstress test is recommended.
- Intermittent maternal and fetal (fetal heart rate) monitoring should be done every hour initially.
- Continuous electronic/more frequent intermittent fetal heart rate monitoring should be started in active labor.

- Progress of labor is monitored using partogram.

- Close watch is kept for temperature, pulse rate, blood pressure, fetal heart pattern, vaginal bleeding, uterine hyperstimulation, uterine rupture and scar dehiscence in women with previous cesarean delivery.

Pain relief

Women should be informed of the availability of pain relief options. Women should be provided pain relief appropriate for them after counseling. This can range from simple analgesics to epidural analgesia. Women should be encouraged to use breathing and relaxation techniques in labor. There is no need to wait for labor analgesia arbitrarily till the cervical dilation has reached 4–5 cm. If given early in labor, it does not affect the progress of labor. Pethidine and opioid analgesia can be used for short term pain relief, preferably in early labor. If regional analgesia is planned, the woman should be informed about the risks and benefits and the implications for her in labor

COMPLICATIONS OF INDUCTION OF LABOR .

- **Uterine Hyperstimulation**

First step is to discontinue oxytocin infusion or withdraw dinoprostone vaginal pessary. Tocolytics preferably betamimetics are recommended for women with uterine hyperstimulation during induction of labour. Contraindications of betamimetics especially cardiac disease should be kept in mind. If associated with abnormal fetal heart pattern, delivery should be accomplished.

- **Uterine Rupture**

Rupture can occur in both scarred and unscarred uterus and is associated with multiparity, malpresentation, unsupervised or aggressive use of uterotonics. Woman with previous cesarean undergoing induction of labor should be counseled. A close watch is kept on maternal signs and monitoring is done for fetal heart rate abnormality. In suspected case of uterine rupture or scar dehiscence, delivery is by emergency cesarean section. 9.3

- **Failed Induction**

Failed induction of labor must be differentiated from failure of labor progress. Maternal and fetal wellbeing should be reassessed. Subsequent management options are:

i. Another attempt to induce labor with a different method can be considered after discussion with the patient but it depends on the nature and urgency of the clinical situation (indication of the induction of labor)

ii. Cesarean delivery.

Counseling of women planned for induction of labor

The information should be provided to the patient and her partner before the process of induction is planned. The woman should be given enough time to discuss and ask any questions. It should include the following:-

i. Indication of induction of labor

ii. Risks vs benefit of induction of labor

iii. Method of induction of labor and its advantages and disadvantages

iv. Any alternatives available

v. Use of electronic equipment for monitoring

vi. Expected duration of labor

vii. Support system available during labor

viii. Pain relief ix.

ix. Option available if induction of labor fails.

Maternal request for induction of labor

The maternal request for induction of labor at term for nonmedical reasons should not be entertained as it is an unnecessary intervention except under exceptional circumstances

VBAC

The decision to undergo trial of labor after cesarean (TOLAC) or schedule a repeat cesarean birth is one in which a patient's values and preferences should be prioritized in a process of shared decision making. While some individuals prioritize the experience of labor in their decision making, the likelihood of a vaginal delivery may also be an important consideration. Pregnant individuals may want to consider the potential risk of complications based on whether a TOLAC results in a vaginal

birth after cesarean (VBAC) or cesarean birth. The complexity of this decision-making process and the desire to incorporate information about individual characteristics and obstetric history into counseling prompted the development of calculators to predict the likelihood of VBAC if TOLAC is undertaken. The most widely validated calculator, the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD) VBAC Calculator, was published in 2007 and identified age, body mass index, history of vaginal delivery, indication for prior cesarean, history of VBAC, and race and ethnicity as predictors. Given the increasing recognition that differences in outcome by race are not biologically based but rather reflect the impact of systemic racism, social determinants of health, and clinician bias, utilizing race and ethnicity variables in a VBAC calculator may deter patients and clinicians from TOLAC without biologic cause and thereby reinforce inequity rather than support patient-centered care.

ANTENATAL CARE FOR WOMEN WITH PREVIOUS C SECTION

Implementation of a VBAC versus ERCS checklist or clinical care pathway is recommended to facilitate best practice in antenatal counselling, shared decision making and documentation. The antenatal

care schedule should comply with that recommended by the NICE antenatal care guideline,24 with specific reviews as shown in Appendices II and III. NICE25 pathways may also be used as guides when devising appropriate local clinical care pathways. In the majority of cases, counselling for mode of delivery could be conducted by a member of the maternity team soon after the woman's midtrimester ultrasound, assuming that therewere no contraindications to planned VBAC. An obstetrician should be involved in any of the following situations: the woman had contraindications that precluded VBAC, she was uncertain of mode of delivery, she specifically requested ERCS, she required induction of labour (e.g. more than 41+0 weeks of gestation) or she developed specific pregnancy complications (e.g. pre-eclampsia, breech presentation, fetal growth restriction, macrosomia). After initial counselling, some more complex cases may need senior support. In most cases, the decision regarding mode of delivery should be finalised by 36+0 weeks of gestation. Having well-structured evidence-based patient information leaflets that list key points, including the probability of the woman having successful VBAC, is likely to improve the informed decisionmaking process on mode of birth after caesarean delivery.

PATIENT BEST SUITED FOR VBAC

Planned VBAC is appropriate for and may be offered to the majority of women with a singleton pregnancy of cephalic presentation at 37+0 weeks or beyond who have had a single previous lower segment caesarean delivery, with or without a history of previous vaginal birth. There is a consensus, endorsed by evidence-based systematic reviews9,16,17 and clinical guidelines,1,6–8 that planned VBAC is a safe and appropriate mode of delivery for the majority of pregnant women with a single previous lower segment caesarean delivery. However, a review of the previous caesarean delivery records and current pregnancy is recommended to identify contraindications to VBAC.

CONTAINDICATIONS

Planned VBAC is contraindicated in women with previous uterine rupture or classical caesarean scar and in women who have other absolute contraindications to vaginal birth that apply irrespective of the presence or absence of a scar (e.g. major placenta praevia). In women with complicated uterine scars, caution should be exercised and decisions should be made on a case-by-case basis by a senior obstetrician with access to the details of previous surgery. Women with the following risk factors are considered to be at increased risk of adverse maternal and/or perinatal outcome as a consequence of VBAC. Previous uterine rupture

Based on limited observational data,28–30 women who have experienced a previous uterine rupture are reported to have a higher risk (5% or higher) of recurrent uterine rupture with labour. Hence previous uterine rupture is considered a contraindication to VBAC. Type of previous uterine incision Based on limited observational data,31,32 there is insufficient evidence to support the safety of VBAC in women with previous inverted T or J incisions, low vertical uterine incisions or significant inadvertent uterine extension at the time of primary caesarean; hence caution should be exercised in these women and decisions should be made by a senior obstetrician on a case-by-case basis. VBAC is contraindicated in women with previous classical caesearean delivery due to the high risk of uterine rupture.

Previous uterine surgery Although previous uterine surgery is not within the scope of this guideline, there is uncertainty whether women who have undergone laparoscopic or abdominal myomectomy, particularly where the uterine cavity has been breached, are at increased risk of uterine rupture.34–41 Uterine rupture after hysteroscopic resection of uterine septum is considered a rare complication.42,43 Given this uncertainty, women who have had such uterine surgery should be considered to have delivery risks at least equivalent to those of VBAC

and managed similarly in labour. Placenta praevia A major degree of placenta praevia (and some cases of minor or partial placenta praevia) is a contraindication to vaginal delivery, including VBAC (see RCOG Green-top Guideline No. 27).44 A systematic review reported that women with one, two, or three or more previous caesarean deliveries experience a 1%, 1.7% or 2.8% risk respectively of placenta praevia in subsequent pregnancies,9 concurring with the findings of a recent UK population study and meta-analysis.45 Placenta accreta occurs in 11–14% of women with placenta praevia and one prior caesarean delivery and in 23–40% of women with placenta praevia and two prior caesarean deliveries. In women with placenta praevia and five or more prior caesarean deliveries, the incidence of placenta accreta is up to 67%.9 In view of these associations, the RCOG and NICE have produced recommendations for women with a previous caesarean delivery which can be found in RCOG Green-top Guideline No. 2744 and the NICE guideline.

DISADVANTAGES OF C SECTION

According to the WHO systematic review, if the increase in CS rate was between 10% and 15%, the maternal and neonatal mortality was decreased.[3,5] However, above this level, increasing the rate of CS is no longer associated with reduced mortality.[5] What is more, unexpected long-term risks of CS continue to be reported such as ectopic pregnancy, unexplained stillbirth, placenta previa, placenta abruption,[6,7] haemorrhage and hysterectomy, endometriosis, increased hospital readmission and even an increase in gallbladder disease and appendicitis.[8,9] It is also worth noting that increasing evidence suggests that cesarean delivery jeopardizes infant, child, and even adult health.[10,11] It was reported that CS delivery can increase the rate of cardio metabolic disease (childhood overweight and obesity, type 1 diabetes), autoimmune and inflammatory disorders (allergic rhinitis, food allergy and atopy, asthma, celiac disease, inflammatory bowel disease), and autism.[12] Therefore, the overuse of cesareans is a real public health concern and it is urgent to reduce the rate of CS. To date, no consensus has been reached on the main factors driving the cesarean epidemic.[13] To reduce the progressively increasing rate of CS, we should find indications for the increased CS rate. The indications for increased CS, however, also

appear to be dependent on the regions and ethnicity studied. And the indications also change as time goes. What is more, after a series of measures such as the implement of Chinese Expert Consensus on Cesarean Section Surgery, the application of new labor, the enhancement the propaganda of benefit of vaginal delivery through the bulletin board, school for pregnant women, birth experience in advance, it was effective for reducing the high rate of caesarean. The aim of our study was to estimate the change of CS rate of Beijing Obstetrics and Gynecology Hospital and find the variation of the indications between 2011 and 2014. We also provide basic reference about the CS rate to find the ways to reduce the CS rate.

MATERIALS AND METHODS

SOURCE OF DATA:

A total of 200 women delivered by caesarean section in the labour ward during the study period are included in this study.

STUDY PERIOD:

June 2021 TO December 2021.

STUDY DESIGN:

Retrospective cross sectional study.

STUDY SUBJECTS:

Sample size: 200

INCLUSION CRITERIA

All women delivered by caesarean section during the study period will be come under the study .

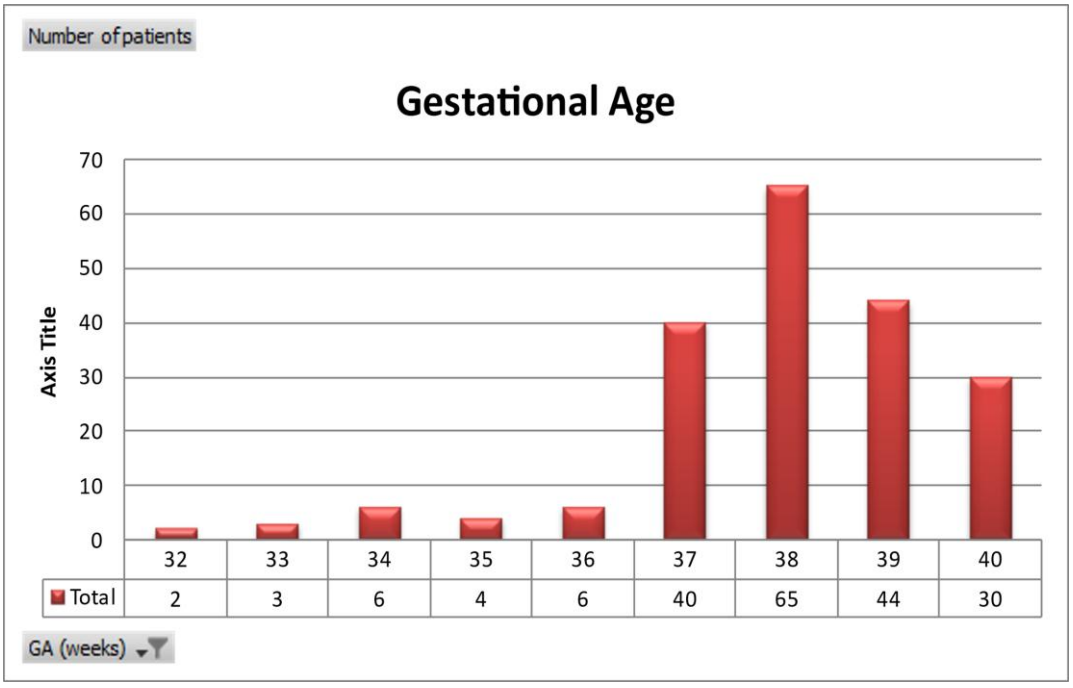
EXCLUSION CRITERIA

All women delivered by vaginally and assisted deliveries are not included in this study.

OBSERVATION AND RESULTS

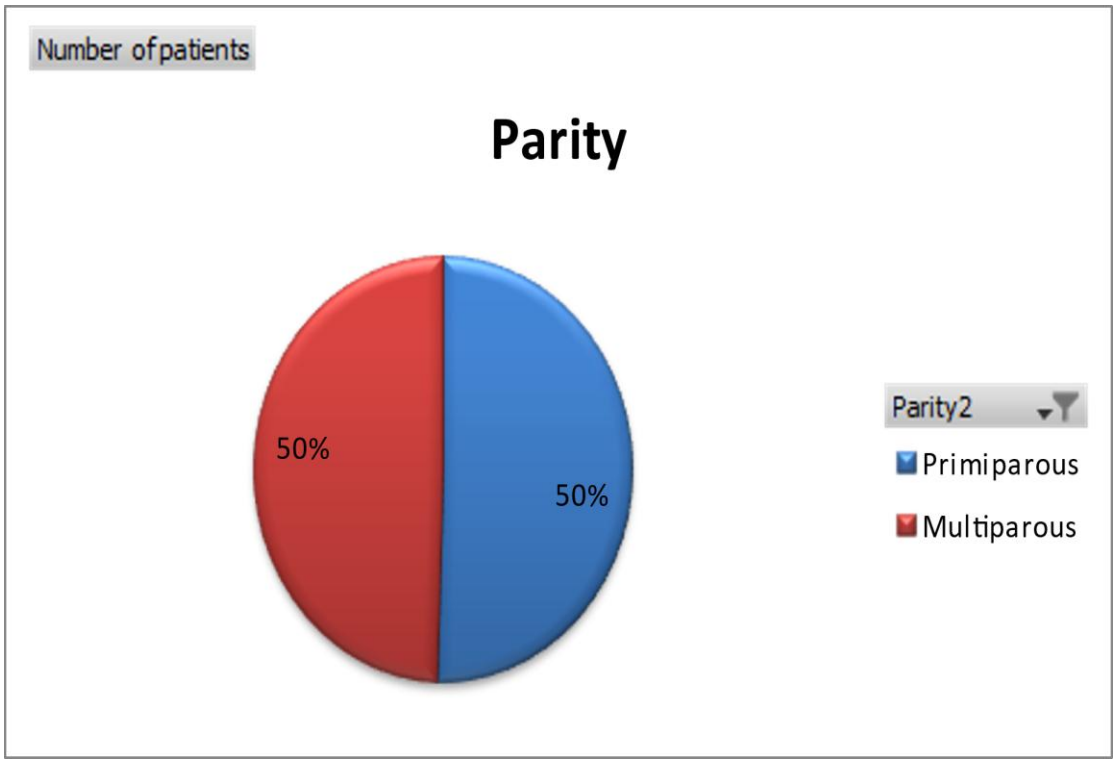
GESTATIONAL AGE DISTRIBUTION

Gestational Age	Number of patients
32	2
33	3
34	6
35	4
36	6
37	40
38	65
39	44
40	30
Grand Total	**200**



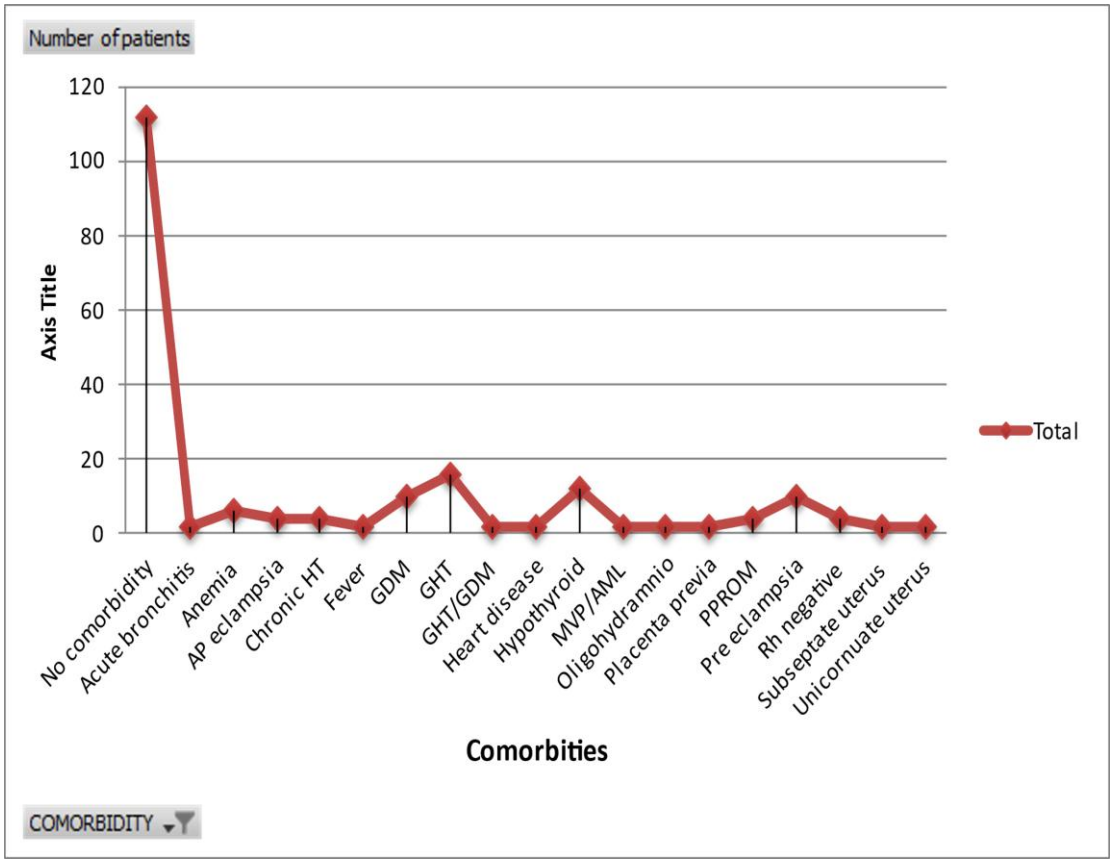
PARITY DISTRIBUTION

Parity	Number of patients
Primiparous	101
Multiparous	99
Grand Total	**200**



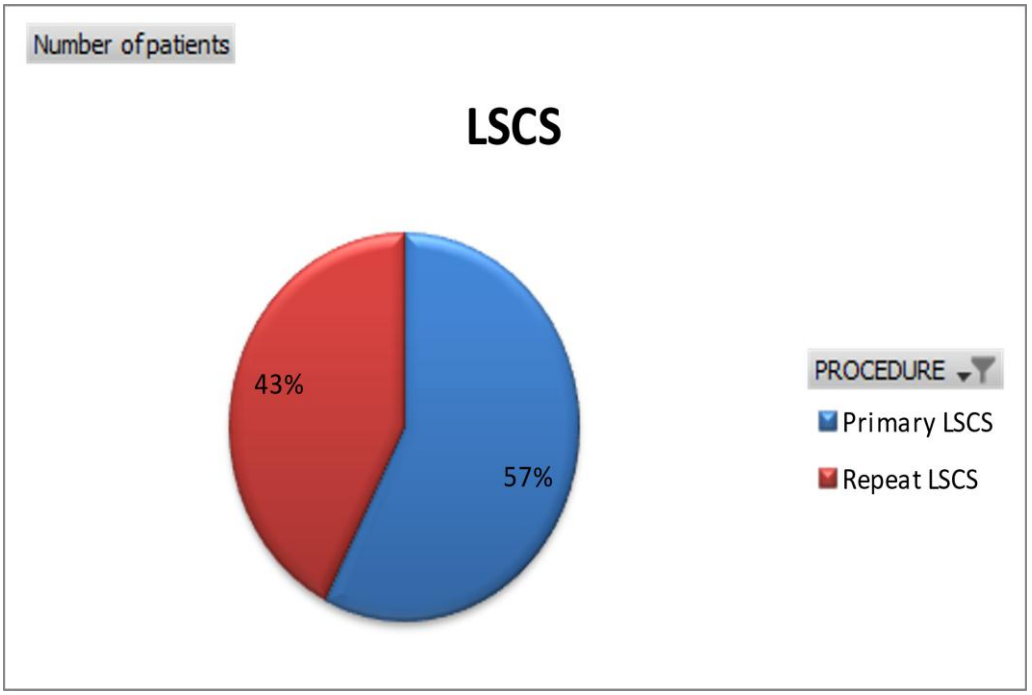
DISTRIBUTION OF COMORBIDITY

Comorbidities	Number of patients
No comorbidity	112
Acute bronchitis	2
Anemia	6
AP eclampsia	4
Chronic HT	4
Fever	2
GDM	10
GHT	16
GHT/GDM	2
Heart disease	2
Hypothyroid	12
MVP/AML	2
Oligohydramnio	2
Placenta previa	2
PPROM	4
Pre eclampsia	10
Rh negative	4
Subseptate uterus	2
Unicornuate uterus	2
Grand Total	**200**


Number of patients
120
100
80
60
40
20
0
Axis Title
No comorbidity
Acute bronchitis
Anemia
AP eclampsia
Chronic HT
Fever
GDM
GHT
GHT/GDM
Heart disease
Hypothyroid
MVP/AML
Oligohydramnio
Placenta previa
PPROM
Pre eclampsia
Rh negative
Subseptate uterus
Unicornuate uterus
Comorbities
Total
COMORBIDITY

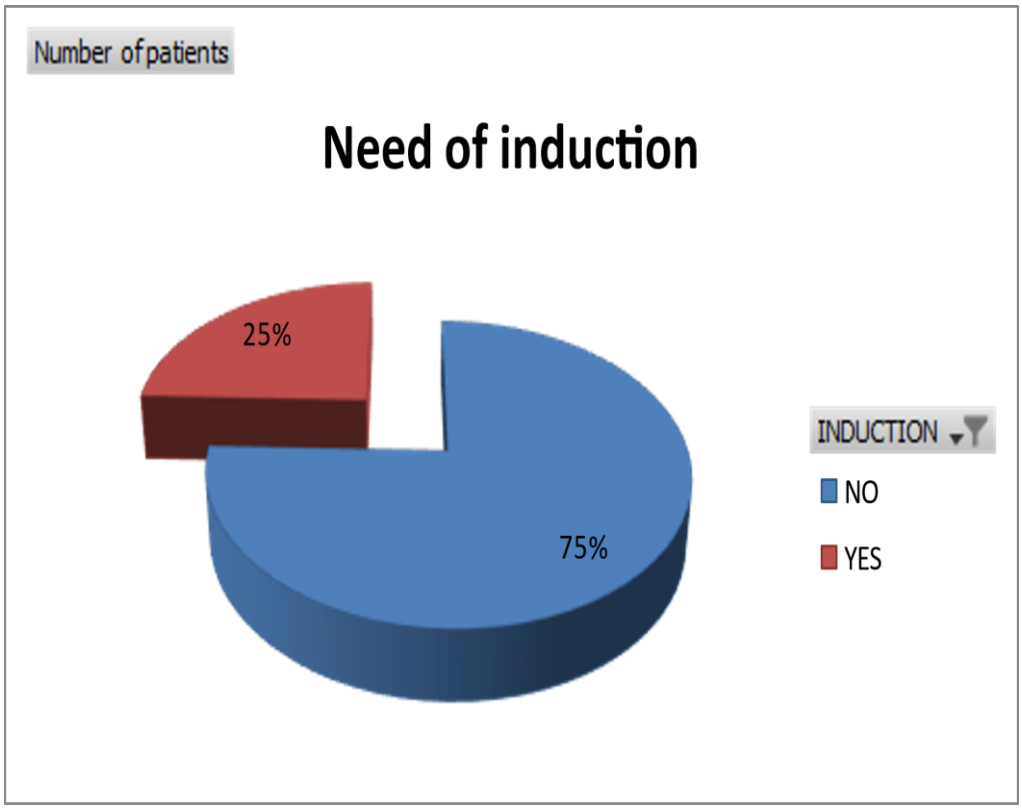
PRIMARY VS REPEAT LSCS

LSCS	Number of patients
Primary LSCS	115
Repeat LSCS	85
Grand Total	**200**



SPONTANEOUS VS INDUCTION

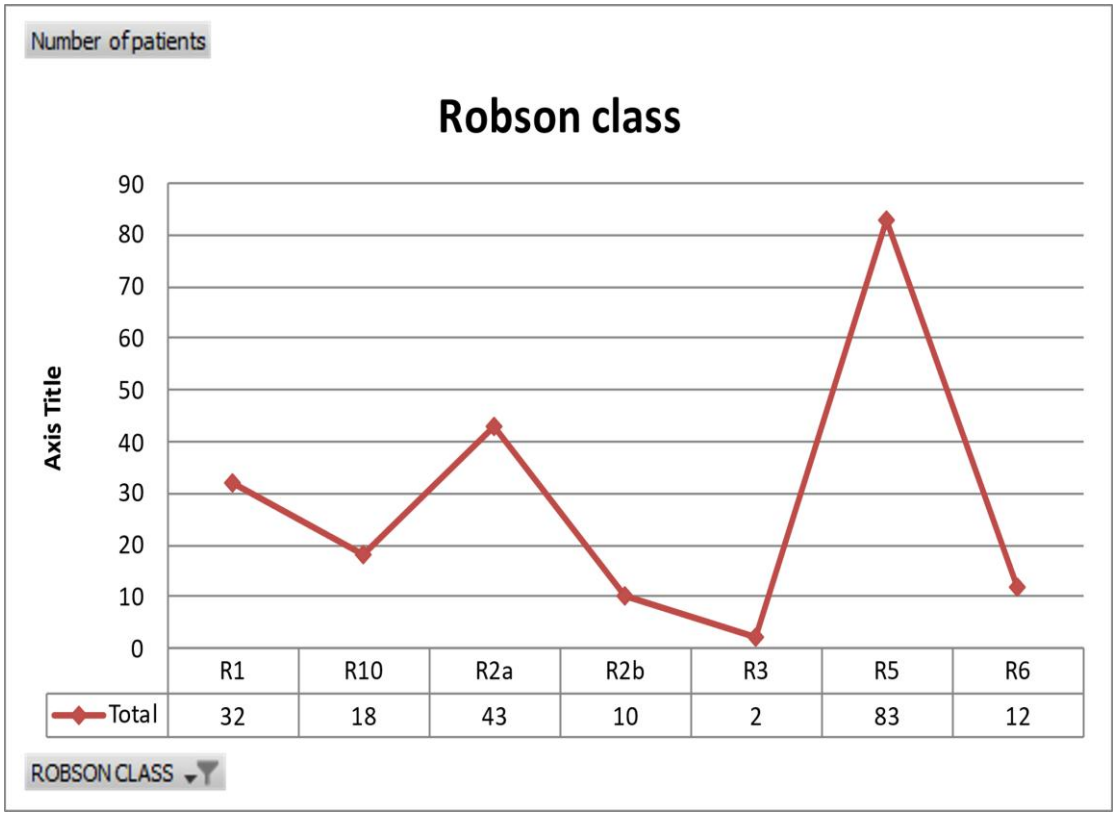
Induction	Number of patients
NO	151
YES	49
Grand Total	**200**



***SPONTANEOUS INCLUDE PREVIOUS CAESAREAN SECTION**

ROBSON CLASS DISTRIBUTION

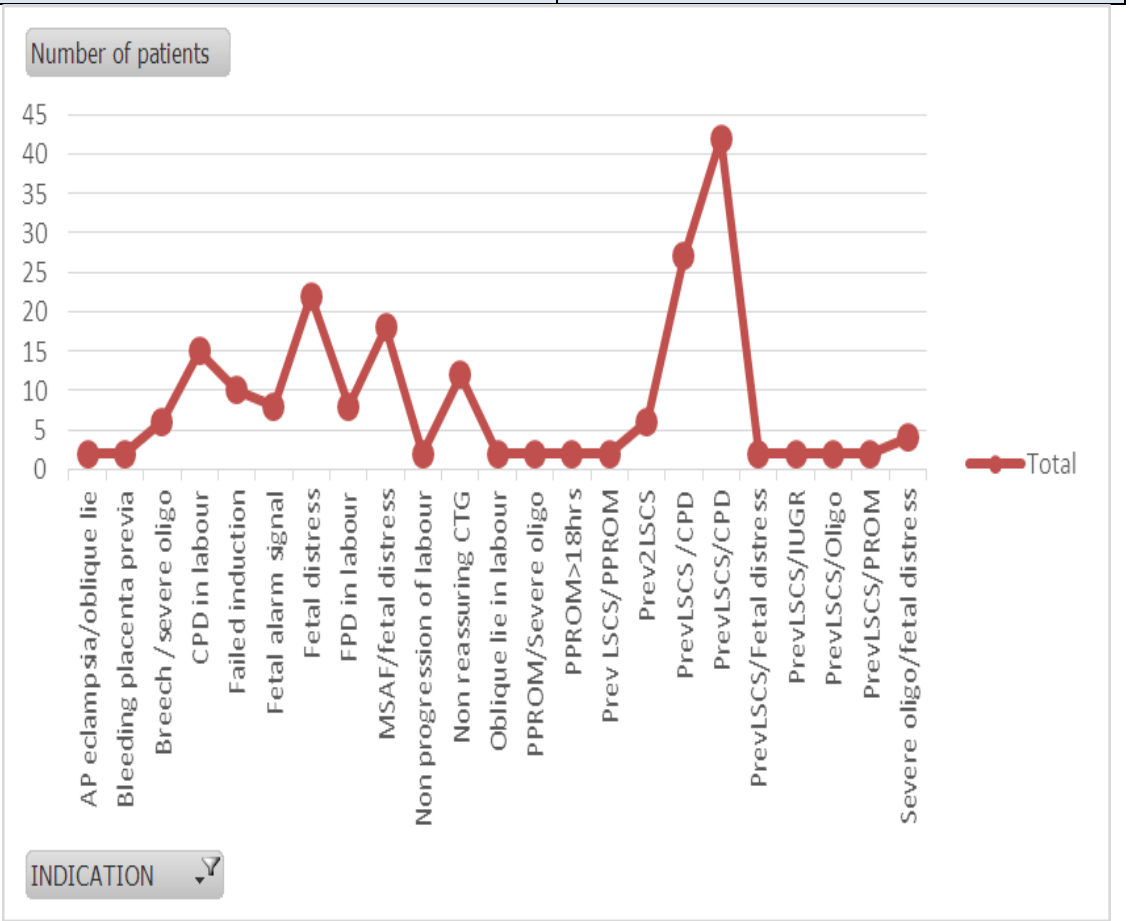
Robson class	Number of patients
R1	32
R10	18
R2a	43
R2b	10
R3	2
R5	83
R6	12
Grand Total	**200**



INDICATION FOR C SECTION

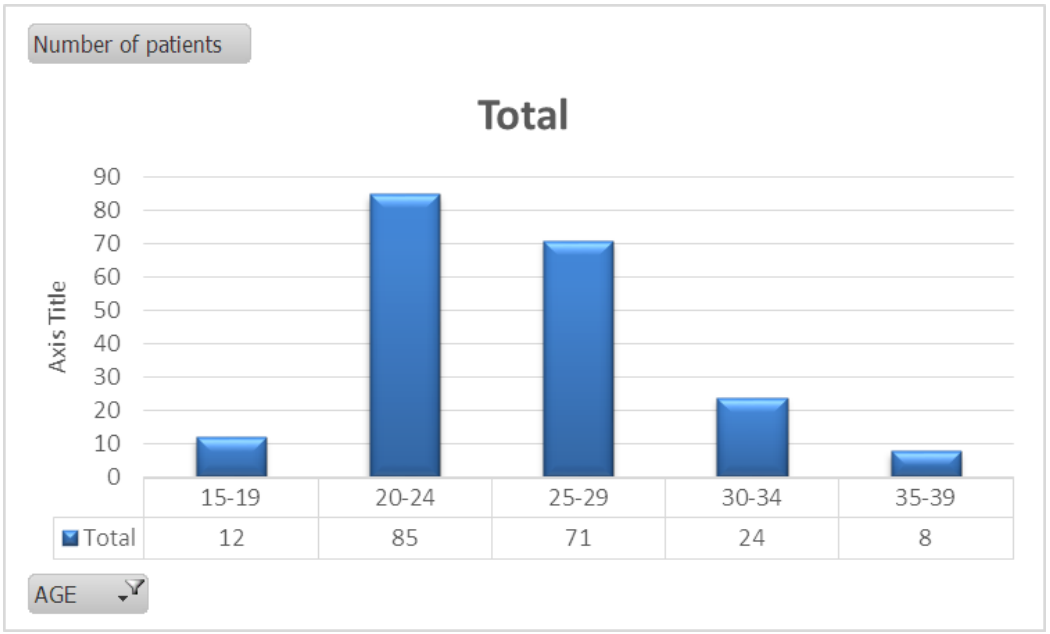
Indication	Number of patients
AP eclampsia/oblique lie	2
Bleeding placenta previa	2
Breech /severe oligo	6
CPD in labour	15
Failed induction	10
Fetal alarm signal	8
Fetal distress	22
FPD in labour	8
MSAF/fetal distress	18
Non progression of labour	2
Non reassuring CTG	12
Oblique lie in labour	2
PPROM/Severe oligo	2
PPROM>18hrs	2
Prev LSCS/PPROM	2
Prev2LSCS	6
PrevLSCS /CPD	27
PrevLSCS/CPD	42
PrevLSCS/Fetal distress	2
PrevLSCS/IUGR	2
PrevLSCS/Oligo	2
PrevLSCS/PROM	2
Severe oligo/fetal distress	4

Grand Total	200



AGE DISTRIBUTION

Age groups	Number of patients
15-19	12
20-24	85
25-29	71
30-34	24
35-39	8
Grand Total	**200**



DISCUSSION

The total number of deliveries over the period was 5197 out of which 2425 were caesarean deliveries, giving an overall caesarean section rate of 46%.

The contribution to the overall caesarean section rate in descending order is as follows:

Group 5 (previous CS, single, cephalic, >37 weeks), group 2 (nulliparous, single cephalic, >37 weeks, induced or CS before labor), group 1 (nulliiparous , single cephalic, >37 weeks, spontaneous labor), group 10 (all single cephalic, <36 weeks (including previous CS)), group 6 (Nulliparous breech), group 3(multiparous, single, cephalic,>37 weeks, spontaneous labour).

The caesarean section rates across the globe have been increasing though rates have varied from center to center. The caesarean section rate in our hospital is 46%, being a biggest referral center could be partly responsible for this higher rate.

From the Robson classification, groups 5, 2 and 1 contributed nearly half of the overall caesarean section rate. This clearly

demonstrates the significance of the Robson criteria, where different institutions and countries would have to develop different strategies to address the caesarean section rates.

Among gestational age,most of the mothers are term(around 38 weeks). Patients with co morbidity, hypertensive disorders of pregnancy especially pre eclampsia, followed by gestational diabetes were being associated with most mothers.

Both nulliparous and multiparous women equally undergone c section. Thus parity and age doesn’t affect c section rates.

Among indication for c section, previous LSCS and fetal distress become major factors resulting in c section.

Maternal comorbidity especially hypertensive disorders like antepartum eclampsia, maternal cardiac disorders ,placental abnormality play a major role in increasing the rate of c section.

SUMMARY

There is clear evidence from this finding that repeat LSCS being the major contributor to the overall rate. Failed induction and revised induction protocols will help in reducing the rate of primary c section.

Trial of labour after caesarean section (TOLAC) is the only remedy to decreasing group 5s contribution to caesarean section rates but the criteria for TOLAC has never being straight forward and tends to be at the discretion of individual obstetrician and risk taking attitude. And often times counseling of the patient is undirected towards this attitude. And in the event of untoward outcome, labour wards staffs (residents and midwives) are so chastised so severely that it kills their initiative and boldness to manage such cases appropriately and so they tend to intervene too soon. However, it must be made clear that decreasing the primary caesarean section rates is the key to reducing overall caesarean section rates. And so attempts should be made to perform most caesarean sections for obstetric reasons. For all other groups optimizing maternal health and inducing labour appropriately would work especially for group 10.

Making available blood and blood products as well as emergency drugs would be imperative, not forgetting multidisciplinary approach to patient care.

There has been much concern about the appropriate management of the first stage of labour, when the active phase actually begins and therefore when to intervene. The important thing is to individualize every labour and so long as monitoring is good and mother and fetus are well, don't set a time limit while patient is in a tertiary center.

However, remember to involve patients in the decision-making process. One wonders looking back, how many patients had caesarean sections on account of prolonged latent phase. And therefore, is history not telling us in a subtle way to be careful at setting time limits for labour. There is the general reluctance to offer ECV despite clear protocols and instruction on the procedure, and yet the surgeon's knife awaits the breech in labour. Generally the fear and reluctance to carry out ECV is also translated to the fear and reluctance to carry out an assisted vaginal breech delivery. Both skills must be taught and reinforced by whatever means appropriate.

Group 11 which represents unclassified group for various reasons including missing data and hysterectomies contributes a high percentage (13%) to the overall caesarean section rates, this implies the enormous challenge of data collection and cleaning that low resource centers still face. That notwithstanding, excluding group 11 from the analysis did not change the trends and ranking of the groups in their contribution to the overall caesarean section rates, making the forgone discussion still appropriate and valid.

Lack of definition or consensus on the core variables used in the classification: For example, it is necessary to reach an agreement on when labour starts and how to clarify the difference between augmentation (acceleration) versus induction of labour. We therefore recommend that each hospital creates a clear written definition (a glossary) of the variables that may vary in different settings (such as spontaneous onset of labour or induction) and add these definitions as a footnote of the Robson Report Table (see Table 5). Quality of the data used to classify women: If the data used is unreliable, the real value of recommendations based on the classification is questionable. Ensuring good quality of the data should not be taken for granted and it can be challenging even in highresource settings. Misclassification of women in wrong groups: This

is a real possibility however you collect your data. In all settings, data collectors need to be carefully trained and audited periodically, for example by another person reviewing and re-classifying a sample of records from women in each of the 10 groups. By looking carefully at the Report Table and following the interpretation rules, users can find important clues about possible misclassification of specific groups. Cases that cannot be classified due to missing data: The size of "Unclassifiable" category is an important indicator of the quality of the data in the individual patient records. The lack of validation of the interpretation rules: A simple set of rules for interpretation was provided by Robson to help users explore all the information provided by this classification, especially when using it to compare data between different settings or changes over time. However, these rules still need to be validated to ensure that the figures proposed (especially regarding expected CS rates per groups) are associated with good maternal and perinatal outcomes. We strongly encourage users of the classification to collect their own data on maternal as well as perinatal morbidity and mortality per Robson group and analyze these data regularly.

CONCLUSION

Hence after implementation of Robson classification in a Tertiary care hospital, will help in reducing the caesarean section rates by revising our induction protocols and effective fetal monitoring. So attempts should be made to perform most caesarean sections for obstetric reasons. For all other groups optimizing maternal health and inducing labour appropriately would reduce caesarean section rates.

Being a tertiary care hospital, referral centre for all high risk cases, decision regarding delivery will depend on both maternal and fetal indication,there by reducing maternal and neonatal morbidity and mortality.

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ANNEXURES

STATEMENT OF CONSENT

I, _____, do hereby volunteer and consent to participate in this study **"ANALYTICAL STUDY OF ROBSON CLASSIFICATION AFTER ITS IMPLEMENTATION IN A TERTIARY CARE HOSPITAL"** being conducted by **Dr. K. SIVARANJANI**, I have read and understood the consent form (or) it has been read and explained to me thoroughly. I am fully aware of the study details as well as aware that I may ask questions to him at any time.

Signature / Left Thumb Impression of the patient

Station: Coimbatore

Date:

Signature / Left Thumb Impression and Name of the witness

Station: Coimbatore

Date :

ஒப்புதல் படிவம்

பெயர் .

வயது , பாலினம் .

முகவரி .

அரசு கோவை மருத்துவக் கல்லூரி மருத்துவமனையில் மகப்பேறு மற்றும் அறுவை சிகிச்சை மருத்துவப் பிரிவில் பட்ட மேற்படிப்பு பயிலும் மாணவி **மரு. க. சிவரஞ்சனி** அவர்கள் மேற்கொள்ளும் **"ANALYTICAL STUDY OF ROBSON CLASSIFICATION AFTER ITS IMPLEMENTATION IN A TERTIARY CARE HOSPITAL"** குறித்த ஆய்வில் செய்முறை மற்றும் அனைத்து விபரங்களையும் கேட்டுக் கொண்டு எனது சந்தேகங்களை தெளிவுப்படுத்திக் கொண்டேன் என்பதை தெரிவித்துக் கொள்கிறேன்.

எனது இந்த ஆய்வில் கலந்து கொள்ள முழு சம்மமத்துடனும், சுய சிந்தனையுடனும் சம்மதிக்கிறேன்.

இந்த ஆய்வில் என்னுடைய விபரங்கள் பாதுகாக்கப்படுவதுடன் இதன் முடிவுகள் ஆய்விதழில் வெளியிடப்படுவதில் ஆட்சேபனை இல்லை என்பதை தெரிவித்துக் கொள்கிறேன். எந்த நேரத்திலும் இந்த ஆய்விலிருந்து நான் விலிகிக் கொள்ள எனக்கு உரிமை உண்டு என்பதையும் அறிவேன்.

இடம் : கையொப்பம்

நாள் :

MASTER CHART

S.No	Name	AGE	EDD	GA	Parity	Comorbidity	Indication	Procedure	Induction	Robson Class
1	POONAM	21	26-10-2021	40	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
2	AMUTHA	24	11-11-2021	38	G2P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
3	SHOBANA	34	16-11-2021	38	G4P1L1A2	Chronic HT	PrevLSCS /CPD	Repeat LSCS	NO	R5
4	JASMIN	25	10-11-2021	38	G1P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
5	MENAGA	23	13-11-2021	38	Primi		Fetal alarm signal	Primary LSCS	YES	R2a
6	PALANAL	30	19-11-2021	37	G2P1L1	GHT	PrevLSCS /CPD	Repeat LSCS	NO	R5
7	SANGEETHA	23	09-11-2021	38	G2P1L1	Anemia	PrevLSCS /CPD	Repeat LSCS	NO	R5
8	DUMBA	25	26-11-2021	36	Primi	GDM	Oblique lie in labour	Primary LSCS	NO	R1
9	SUGANYA	28	02-11-2021	39	G2P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
10	MADINA	24	17-11-2021	38	G2P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
11	GOWTHAMI	30	19-11-2021	37	G3P2L1	Hypothyroid	PrevLSCS /CPD	Repeat LSCS	NO	R5
12	REVATHY	19	14-11-2021	38	Primi		Breech /severe oligo	Primary LSCS	NO	R6
13	PRIYA	32	22-11-2021	37	G2P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
14	NISHA	22	02-12-2021	34	Primi	Unicornuate uterus	Breech /severe oligo	Primary LSCS	NO	R10
15	PRIYA	31	31-10-2021	40	Primi	Oligohydramnio	Non progression of labour	Primary LSCS	YES	R2a
16	JAYALAKSHMI	32	16-11-2021	38	G2P1L1	Hypothyroid	PrevLSCS /CPD	Repeat LSCS	NO	R5
17	GEETHA	24	19-11-2021	38	Primi	Pre eclampsia	Failed induction	Primary LSCS	YES	R2a
18	SATHYA	21	16-11-2021	38	G2P1L1	Pre eclampsia	PrevLSCS /CPD	Repeat LSCS	NO	R5
19	SIVAGAMI	26	01-12-2021	36	Primi	Heart disease	Fetal alarm signal	Primary LSCS	NO	R10
20	MATHUMATHI	21	01-11-2021	40	Primi		Fetal distress	Primary LSCS	NO	R5
21	DEVIKA	26	01-11-2021	40	G4P1L1A2		CPD in labour	Primary LSCS	YES	R2a
22	MURUGA	26	27-11-2021	37	G2P1L1	Pre eclampsia	PrevLSCS /CPD	Repeat LSCS	NO	R5

23	SUBA	20	09-11-2021	39	Primi		Fetal distress	Primary LSCS	NO	R1
24	JANANI	27	05-11-2021	39	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
25	PUSHPA	37	22-11-2021	37	G2P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
26	KANNIYAMMAL	26	24-11-2021	37	G3P2L1	Anemia	Prev2LSCS	Repeat LSCS	NO	R5
27	PANDIPRIYA	18	30-10-2021	40	Primi		CPD in labour	Primary LSCS	YES	R2a
28	MAHESWARI	27	13-11-2021	38	G3P1L1A1		PrevLSCS /CPD	Repeat LSCS	NO	R5
29	SHARMILA	31	10-12-2021	35	G3P2L2	GDM	PrevLSCS/Fetal distress	Repeat LSCS	NO	R10
30	BENAZIR	23	30-10-2021	40	Primi		Fetal distress	Primary LSCS	YES	R2a
31	BANUPRIYA	29	01-11-2021	40	Primi		Severe oligo/fetal distress	Primary LSCS	NO	R2b
32	SATHYA	26	06-11-2021	39	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
33	SELVI	34	16-11-2021	38	G3P2L2		Prev2LSCS	Repeat LSCS	NO	R5
34	SAVITHRI	33	16-11-2021	38	G6P1L1A4		PrevLSCS/CPD	Repeat LSCS	NO	R5
35	ANUSHYA	27	25-11-2021	37	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
36	UMA	29	07-11-2021	39	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
37	SUMITHRA	23	05-11-2021	39	Primi	GHT	Fetal distress	Primary LSCS	YES	R2a
38	KALPANA	35	18-11-2021	37	G2P1L1	GHT/GDM	PrevLSCS/CPD	Repeat LSCS	NO	R5
39	PARIMALA	27	13-11-2021	38	Primi		Breech /severe oligo	Primary LSCS	NO	R6
40	GUNAVATHI	20	01-11-2021	40	Primi	Anemia	CPD in labour	Primary LSCS	YES	R2a
41	MEGALA	28	15-11-2021	38	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
42	KARTHIGA	31	19-11-2021	37	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
43	SHARMILA	25	02-11-2021	40	Primi	GHT	Non reassuring CTG	Primary LSCS	YES	R2a
44	SABEENA	25	20-11-2021	38	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
45	JENIFER	23	16-11-2021	38	G2P1L1	GDM	PrevLSCS/CPD	Repeat LSCS	NO	R5
46	OVIYA	23	14-11-2021	38	Primi		Fetal distress	Primary LSCS	YES	R2a
47	KAVIYA	26	10-11-2021	39	G2P1L1	Rh negative	CPD in labour	Primary LSCS	NO	R3
48	NANDHINI	27	09-11-2021	39	Primi		Fetal distress	Primary LSCS	NO	R1

49	MONIKA	24	02-11-2021	40	G2A1	AP eclampsia	Failed induction	Primary LSCS	YES	R2a
50	PADMINI	23	03-11-2021	40	G2P1L1	Hypothyroid	PrevLSCS/CPD	Repeat LSCS	NO	R5
51	PRIYANKA	22	11-11-2021	39	G2P1L1	Acute bronchitis	PrevLSCS/CPD	Repeat LSCS	NO	R5
52	BANUPRIYA	22	08-11-2021	39	G2P1L1		MSAF/fetal distress	Primary LSCS	NO	R1
53	PREMA	28	02-11-2021	40	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
54	SUGANYA	27	16-11-2021	38	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
55	KRISHNAVENI	19	01-11-2021	39	Primi	Hypothyroid	FPD in labour	Primary LSCS	NO	R6
56	PAVITHRA	27	12-11-2021	38	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
57	MALA	24	12-11-2021	38	G2P1L0	Hypothyroid	PrevLSCS/CPD	Repeat LSCS	NO	R5
58	KANMANI	19	04-01-2021	32	G2A1	Pre eclampsia	Failed induction	Primary LSCS	YES	R10
59	SANTHAKUMARI	24	11-11-2021	39	Primi		FPD in labour	Primary LSCS	NO	R6
60	MEENA	23	04-11-2021	39	G3P1L1A1		PrevLSCS/CPD	Repeat LSCS	NO	R5
61	PAVITHRA	27	12-11-2021	39	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
62	MUTHULAKSHMI	33	17-11-2021	38	G2P1L1		PrevLSCS/Oligo	Repeat LSCS	NO	R5
63	PRIYANKA	21	02-11-2021	40	Primi		Fetal distress	Primary LSCS	YES	R2a
64	ASHWINI	23	09-11-2021	39	Primi	MVP/AML	MSAF/fetal distress	Primary LSCS	NO	R1
65	ANUSHYA	19	09-11-2021	39	Primi		CPD in labour	Primary LSCS	NO	R1
66	NIRMALA	26	27-11-2021	37	G2P1L1	Rh negative	PrevLSCS/CPD	Repeat LSCS	NO	R5
67	SANGEETHA	36	21-11-2021	37	G2P1L1	Chronic HT	PrevLSCS/CPD	Repeat LSCS	NO	R5
68	SANTHIYA	28	14-11-2021	38	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
69	SUNDARI	32	15-11-2021	38	G2P1L1	Fever	PrevLSCS/IUGR	Repeat LSCS	NO	R5
70	LAKSHMIPRIYA	20	03-12-2021	34	G3A2	PPROM	PPROM>18hrs	Primary LSCS	NO	R10
71	PENSILVYA	22	26-11-2021	37	G2A1	GDM	Fetal distress	Primary LSCS	YES	R2a
72	LAKSHANA	21	25-11-2021	37	Primi	Subseptate uterus	FPD in labour	Primary LSCS	NO	R6
73	SOWMIYA	20	22-11-2021	37	Primi		Non reassuring CTG	Primary LSCS	NO	R1
74	SEETHA	26	22-11-2021	37	G3P2L2		Prev2LSCS	Repeat LSCS	NO	R5

75	MAHESWARI	23	10-11-2021	39	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
76	GOWRI	28	17-11-2021	38	Primi		CPD in labour	Primary LSCS	YES	R2a
77	SOWNDARYA	25	03-11-2021	40	Primi	GHT	Non reassuring CTG	Primary LSCS	YES	R2a
78	SRIDEVI	23	09-11-2021	39	G2P1L1	GDM	PrevLSCS/CPD	Repeat LSCS	NO	R5
79	SARANYA	20	21-12-2021	34	Primi		Fetal alarm signal	Primary LSCS	NO	R10
80	RAMYA	22	09-11-2021	39	Primi		Fetal distress	Primary LSCS	Yes	R1
81	CHITHRA	25	27-11-2021	37	Primi	GHT	Non reassuring CTG	Primary LSCS	YES	R2a
82	SANGEETHA	22	23-11-2021	37	Primi	Placenta previa	Bleeding placenta previa	Primary LSCS	NO	R2b
83	GAYATHRI	26	14-11-2021	38	Primi		Fetal distress	Primary LSCS	YES	R2a
84	DEEPA	27	17-11-2021	38	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
85	DHANUSHYA	23	05-11-2021	39	Primi		Fetal distress	Primary LSCS	NO	R1
86	VANAJA	19	01-12-2021	36	Primi		Non reassuring CTG	Primary LSCS	YES	R10
87	NISHA	21	16-11-2021	38	Primi	GHT	Failed induction	Primary LSCS	YES	R2a
88	PADMAPRIYA	20	18-11-2021	38	Primi	GHT	Failed induction	Primary LSCS	YES	R2a
89	KARTHIGA	23	07-12-2021	35	G3P2L2	PPROM	Prev LSCS/PPROM	Repeat LSCS	NO	R10
90	PAVITHRA	20	07-11-2021	39	Primi		Severe oligo/fetal distress	Primary LSCS	NO	R2b
91	POONGODI	25	22-01-2022	33	G2P1L1		PPROM/Severe oligo	Primary LSCS	NO	R10
92	NIRMALA	22	18-11-2021	37	Primi	Pre eclampsia	Non reassuring CTG	Primary LSCS	YES	R2a
93	THENMOZHI	24	26-11-2021	37	Primi	AP eclampsia	AP eclampsia/oblique lie	Primary LSCS	NO	R2b
94	BHARATHI	27	19-11-2021	38	G2P1L1	Hypothyroid	PrevLSCS/PROM	Repeat LSCS	NO	R5
95	LALITHA	20	12-11-2021	38	Primi		FPD in labour	Primary LSCS	NO	R6
96	SUDHAMANI	35	15-11-2021	38	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
97	ABIRAMI	22	21-11-2021	37	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
98	NANDHINI	27	01-11-2021	40	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
99	SUDA	25	05-11-2021	39	Primi	GHT	Fetal alarm signal	Primary LSCS	NO	R2b
100	SIRUMBAYI	24	12-11-2021	38	Primi		CPD in labour	Primary LSCS	YES	R2a

101	VANMATHI	21	26-11-2021	40	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
102	MONIKA	24	11-12-2021	38	G2P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
103	SEVANTHI	34	16-12-2021	38	G4P1L1A2	Chronic HT	PrevLSCS /CPD	Repeat LSCS	NO	R5
104	KARTHIGA	25	10-12-2021	38	G1P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
105	ARTHY	23	13-12-2021	38	Primi		Fetal alarm signal	Primary LSCS	YES	R2a
106	SHALINI	30	19-12-2021	37	G2P1L1	GHT	PrevLSCS /CPD	Repeat LSCS	NO	R5
107	JOTHIMANI	23	09-12-2021	38	G2P1L1	Anemia	PrevLSCS /CPD	Repeat LSCS	NO	R5
108	VALARMATHI	25	26-12-2021	36	Primi	GDM	Oblique lie in labour	Primary LSCS	NO	R1
109	PARIMALA	28	02-12-2021	39	G2P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
110	DEEPA	30	19-12-2021	37	G3P2L1	Hypothyroid	PrevLSCS /CPD	Repeat LSCS	NO	R5
111	SARANYA	19	14-12-2021	38	Primi		Breech /severe oligo	Primary LSCS	NO	R6
112	SABANA	32	22-12-2021	37	G2P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
113	KOWSALYA	22	02-12-2021	34	Primi	Unicornuate uterus	Breech /severe oligo	Primary LSCS	NO	R10
114	LAKSHMI	31	31-12-2021	40	Primi	Oligohydramnio	Non progression of labour	Primary LSCS	YES	R2a
115	SIDDHAMMAL	32	16-12-2021	38	G2P1L1	Hypothyroid	PrevLSCS /CPD	Repeat LSCS	NO	R5
116	PRINCEY	24	19-12-2021	38	Primi	Pre eclampsia	Failed induction	Primary LSCS	YES	R2a
117	KASTHURI	21	16-12-2021	38	G2P1L1	Pre eclampsia	PrevLSCS /CPD	Repeat LSCS	NO	R5
118	KANIMOZHI	26	01-12-2021	36	Primi	Heart disease	Fetal alarm signal	Primary LSCS	NO	R10
119	SHANTHAMANI	21	01-12-2021	40	Primi		Fetal distress	Primary LSCS	NO	R5
120	USHA	26	01-12-2021	40	G4P1L1A2		CPD in labour	Primary LSCS	YES	R2a
121	UMA	26	27-12-2021	37	G2P1L1	Pre eclampsia	PrevLSCS /CPD	Repeat LSCS	NO	R5
122	KAVYA	20	09-12-2021	39	Primi		Fetal distress	Primary LSCS	NO	R1
123	RAMYA	27	05-12-2021	39	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
124	SINDHUJA	37	22-12-2021	37	G2P1L1		PrevLSCS /CPD	Repeat LSCS	NO	R5
125	SARANYA	26	24-12-2021	37	G3P2L1	Anemia	Prev2LSCS	Repeat LSCS	NO	R5
126	PRAGATHI	18	30-11-2021	40	Primi		CPD in labour	Primary LSCS	YES	R2a

127	JOTHI	27	13-12-2021	38	G3P1L1A1		PrevLSCS /CPD	Repeat LSCS	NO	R5
128	DHIVYA	31	10-12-2021	35	G3P2L2	GDM	PrevLSCS/Fetal distress	Repeat LSCS	NO	R10
129	MALATHI	23	30-12-2021	40	Primi		Fetal distress	Primary LSCS	YES	R2a
130	KOWSALYA	29	01-12-2021	40	Primi		Severe oligo/fetal distress	Primary LSCS	NO	R2b
131	ANUSHYA	26	06-12-2021	39	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
132	RISHANA	34	16-12-2021	38	G3P2L2		Prev2LSCS	Repeat LSCS	NO	R5
133	CHANDRALEKA	33	16-12-2021	38	G6P1L1A4		PrevLSCS/CPD	Repeat LSCS	NO	R5
134	THENMOZHI	27	25-12-2021	37	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
135	REKA	29	07-12-2021	39	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
136	KAVYA	23	05-12-2021	39	Primi	GHT	Fetal distress	Primary LSCS	YES	R2a
137	DHANAM	35	18-12-2021	37	G2P1L1	GHT/GDM	PrevLSCS/CPD	Repeat LSCS	NO	R5
138	YASINA	27	13-12-2021	38	Primi		Breech /severe oligo	Primary LSCS	NO	R6
139	SANGEETHA	20	01-12-2021	40	Primi	Anemia	CPD in labour	Primary LSCS	YES	R2a
140	PARVEEN TAJ	28	15-12-2021	38	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
141	GOPIKASHRI	31	19-12-2021	37	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
142	MADUMITHA	25	02-12-2021	40	Primi	GHT	Non reassuring CTG	Primary LSCS	YES	R2a
143	ANJALI	25	20-12-2021	38	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
144	VALARMATHI	23	16-12-2021	38	G2P1L1	GDM	PrevLSCS/CPD	Repeat LSCS	NO	R5
145	LAKSHMI	23	14-12-2021	38	Primi		Fetal distress	Primary LSCS	YES	R2a
146	INDHUMATHI	26	10-12-2021	39	G2P1L1	Rh negative	CPD in labour	Primary LSCS	NO	R3
147	SHANTHI	27	09-12-2021	39	Primi		Fetal distress	Primary LSCS	NO	R1
148	LOKESHWARI	24	02-12-2021	40	G2A1	AP eclampsia	Failed induction	Primary LSCS	YES	R2a
149	ANBARASI	23	03-12-2021	40	G2P1L1	Hypothyroid	PrevLSCS/CPD	Repeat LSCS	NO	R5
150	SIVAGAMI	22	11-12-2021	39	G2P1L1	Acute bronchitis	PrevLSCS/CPD	Repeat LSCS	NO	R5
151	PRABAATHY	22	08-12-2021	39	G2P1L1		MSAF/fetal distress	Primary LSCS	NO	R1
152	DEEPA	28	02-12-2021	40	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5

153	ANANDHI	27	16-12-2021	38	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
154	JEEVITHA	19	01-12-2021	39	Primi	Hypothyroid	FPD in labour	Primary LSCS	NO	R6
155	PAVITHRA	27	12-12-2021	38	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
156	JAYANTHI	24	12-12-2021	33	G2P1L0	Hypothyroid	PrevLSCS/CPD	Repeat LSCS	NO	R5
157	BARGATH NISHA	19	04-01-2022	32	G2A1	Pre eclampsia	Failed induction	Primary LSCS	YES	R10
158	THARANI	24	11-12-2021	39	Primi		FPD in labour	Primary LSCS	NO	R6
159	JAYANTHI	23	04-12-2021	39	G3P1L1A1		PrevLSCS/CPD	Repeat LSCS	NO	R5
160	DIVYA	27	12-12-2021	39	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
161	AKILA	33	17-12-2021	38	G2P1L1		PrevLSCS/Oligo	Repeat LSCS	NO	R5
162	NITHYA	21	02-12-2021	40	Primi		Fetal distress	Primary LSCS	YES	R2a
163	SELVANAYAGI	23	09-12-2021	39	Primi	MVP/AML	MSAF/fetal distress	Primary LSCS	NO	R1
164	SHAKINA	19	09-12-2021	39	Primi		CPD in labour	Primary LSCS	NO	R1
165	ANITHA	26	27-12-2021	37	G2P1L1	Rh negative	PrevLSCS/CPD	Repeat LSCS	NO	R5
166	KIRAN	36	21-12-2021	37	G2P1L1	Chronic HT	PrevLSCS/CPD	Repeat LSCS	NO	R5
167	ABINAYA	28	14-12-2021	38	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
168	SUJITHA	32	15-12-2021	38	G2P1L1	Fever	PrevLSCS/IUGR	Repeat LSCS	NO	R5
169	DEEPA	20	03-12-2021	34	G3A2	PPROM	PPROM>18hrs	Primary LSCS	NO	R10
170	NAGAJOTHI	22	26-12-2021	37	G2A1	GDM	Fetal distress	Primary LSCS	YES	R2a
171	LATHA	21	25-12-2021	37	Primi	Subseptate uterus	FPD in labour	Primary LSCS	NO	R6
172	ALAGESHWARI	20	22-12-2021	37	Primi		Non reassuring CTG	Primary LSCS	NO	R1
173	CHITHRA	26	22-12-2021	37	G3P2L2		Prev2LSCS	Repeat LSCS	NO	R5
174	MANIMEGALAI	23	10-12-2021	39	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
175	REENADEVI	28	17-12-2021	38	Primi		CPD in labour	Primary LSCS	YES	R2a
176	THENMOZHI	25	03-12-2021	40	Primi	GHT	Non reassuring CTG	Primary LSCS	YES	R2a
177	KOWSALYA	23	09-12-2021	39	G2P1L1	GDM	PrevLSCS/CPD	Repeat LSCS	NO	R5
178	VENNILA	20	21-12-2021	34	Primi		Fetal alarm signal	Primary LSCS	NO	R10

179	KAVYA	22	09-12-2021	39	Primi		Fetal distress	Primary LSCS	Yes	R1
180	ESHWARI	25	27-12-2021	37	Primi	GHT	Non reassuring CTG	Primary LSCS	YES	R2a
181	KRISHNAVENI	22	23-12-2021	37	Primi	Placenta previa	Bleeding placenta previa	Primary LSCS	NO	R2b
182	PANJALI	26	14-12-2021	38	Primi		Fetal distress	Primary LSCS	YES	R2a
183	ROOBA	27	17-12-2021	38	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
184	SEEMA	23	05-12-2021	39	Primi		Fetal distress	Primary LSCS	NO	R1
185	PAVITHRA	19	01-12-2021	36	Primi		Non reassuring CTG	Primary LSCS	YES	R10
186	SUGUNA	21	16-12-2021	38	Primi	GHT	Failed induction	Primary LSCS	YES	R2a
187	KALAIVANI	20	18-12-2021	38	Primi	GHT	Failed induction	Primary LSCS	YES	R2a
188	AJITHRA	23	07-12-2021	35	G3P2L2	PPROM	Prev LSCS/PPROM	Repeat LSCS	NO	R10
189	GEETHA	20	07-12-2021	39	Primi		Severe oligo/fetal distress	Primary LSCS	NO	R2b
190	POONGODI	25	22-02-2022	33	G2P1L1		PPROM/Severe oligo	Primary LSCS	NO	R10
191	VIDHYA	22	18-12-2021	37	Primi	Pre eclampsia	Non reassuring CTG	Primary LSCS	YES	R2a
192	SORNALATHA	24	26-12-2021	37	Primi	AP eclampsia	AP eclampsia/oblique lie	Primary LSCS	NO	R2b
193	KEERTHANA	27	19-12-2021	38	G2P1L1	Hypothyroid	PrevLSCS/PROM	Repeat LSCS	NO	R5
194	PRABHA	20	12-12-2021	38	Primi		FPD in labour	Primary LSCS	NO	R6
195	NAGAVALLI	35	15-12-2021	38	G2P1L1		PrevLSCS/CPD	Repeat LSCS	NO	R5
196	DEVIKA	22	21-12-2021	37	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
197	INDHUMATHI	27	01-12-2021	40	Primi		MSAF/fetal distress	Primary LSCS	NO	R1
198	SATHYA	25	05-12-2021	39	Primi	GHT	Fetal alarm signal	Primary LSCS	NO	R2b
199	KEERTHI	24	12-12-2021	38	Primi		CPD in labour	Primary LSCS	YES	R2a
200	FATHIMA	28	17-12-2021	38	Primi		CPD in labour	Primary LSCS	YES	R2a