ORIGINAL RESEARCH PAPER
Volume - 11 | Issue - 08 | August - 2022 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

RISK OF CAESAREAN DELIVERY AFTER INDUCTION OF LABOUR IN WOMEN WITH UNFAVOURABLE CERVIX AT TERM COMPARED TO THOSE WITH FAVOURABLE CERVIX AND EFFICACY OF INDUCTION METHODS USED IN UNFAVOURABLE CERVIX AT GOVERNMENT MATERNITY HOSPITAL, TIRUPATHI-A PROSPECTIVE COMPARATIVE STUDY

Obstetrics & Gynaecology

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KEYWORDS

INTRODUCTION

Induction of labour is one of the most common obstetric interventions. The incidence of induction varies from setting to setting ranging from 5% to 22% of all labour room admissions and depends upon the institutional protocol[1]. In developed countries, the number of infants delivered at term following induction of labor can be as high as one in four deliveries[2]. The World Health Organization (WHO) Global Survey on Maternal and Perinatal Health, conducted in 24 countries which included nearly 3,00,000 observations, showed that 9.6% of them were delivered by labor induction[3]. Induction of labor has merit as a therapeutic option when the benefits of expeditious delivery outweigh the risks of continuing the pregnancy.

The benefits of labor induction must be weighed against the potential maternal and fetal risks associated with this procedure[4].The infant should be delivered in good condition in an acceptable time frame and with a minimum of maternal discomfort and side effects. Alternatively labour induction may be complicated by uterine tachysystole, uterine hyperstimulation with fetal heart rate abnormalities or fetal distress, prolonged labour, prolonged membrane rupture, chorioamnionitis and cesarean delivery. Because of the presence of underlying maternal and fetal medical conditions leading to induction and because the uterus and uterine cervix are often not prepared for labour when induction becomes necessary it may be associated with prolonged labour and a significantly increased risk of cesarean delivery when compared to women entering labour spontaneously[5,6].

With primary cesarean delivery rate on the rise and a trend towards declining at first cesarean delivery has important implications for both current and future pregnancies.

Successful labour is clearly related to the state of cervix. A 'ripe' soft yielding cervix requires a lower quantum of uterine work than an 'unripe', hard and rigid one would. An unripe cervix fails to dilate well in response to myometrial contraction[7]. Women with an unfavourable cervix have increased risk of induction failure and increased risk of cesarean delivery. Studies about induction of labour and caesarean delivery showed varied results most of them concluded and increased incidence of caesarean delivery after induction. The purpose of this study is to explore the risk of cesarean delivery after induction of labour in an unfavourable cervix and to compare the efficacy of induction methods used in unfavourable cervix.

AIMS AND OBJECTIVES

AIMS :

1. To compare therisk of caesarean delivery after induction of labour in women with unfavourable cervix to that of women with favourable cervix.
2. To compare the efficacy of induction methods used in women with unfavourable cervix.

OBJECTIVES:

1. To record and compare the number of caesarean deliveries after induction of labour in women with unfavourable cervix to that of women with favourable cervix.
2. To determine the a)Induction-active phase interval
a. Induction-delivery interval
b. maternal outcome in terms of PPH,perineal tears,sepsis
c. Fetal outcome in terms of low APGAR,SNCU admissions,NICU admissions among the three induction methods used in those with unfavourable cervix.

Generally women with unfavourable cervix are at an increased risk of cesarean delivery compared to those with favorable cervix.This study needs to prove this observation along with the efficacy of the three induction methods used in unfavorable cervix.

PATIENTS AND METHODS

The present prospective comparative study was carried out in nulliparous and multiparous women at term with singleton pregnancy admitted to labour ward and to Antenatal ward, Government Maternity Hospital affiliated to the Department of Obstetrics and Gynaecology, Sri Venkateswara Medical College, Tirupathi for a period of one year from November 2017 to October 2018 after obtaining permission from the Institutional Ethical Committee. It is a tertiary teaching centre where each year around 13000 to 14000 deliveries take place.

STUDY DESIGN: - A Prospective Comparative Study

INCLUSION CRITERIA:

a) Nulliparous and multiparous women
b) Singleton pregnancy.
c) Gestational age between 37 and 42wks.
d) Live fetus.
e) Vertex presentation
g) Having indication for induction of labour
h) Adequate pelvis
I) Reassuring FHR.

EXCLUSION CRITERIA:

- Those women not giving consent for the study.
- Contraindications for induction of labour:

1) Cephalo pelvic disproportion
2) Fetal malpresentation – Breech presentation, transverse lie,oblique lie.
3) Placenta previa or vasa previa
4) Cord presentation
5) Previous h/o uterine scar

- Heart disease to the patient
- Active genital herpes infection
- Intrauterine fetal demise
- Fetal anomalies
- Medical contraindication/known hypersensitivity to oxytocin or prostaglandins.

METHODOLOGY

Subjects in the alloted ward of the investigator and those admitted during round the clock duties of the investigator fulfilling the inclusion criteria were enrolled after taking informed consent and were followed through out their delivery and in their post natal period till discharge from hospital by the investigator.The subjects were alloted by statified selective sampling method to Group1 (those mothers with a favourable cervix i.e.,Bishop score ≥5) and to Group 2 (those mothers with an unfavourable cervix i.e.,Bishop score <5).Once a subject with favourable cervix was alloted to Group 1,the next subject with an unfavourable cervix was alloted to Group 2.The subjects in Group 2 were consecutively alloted to sub groups 2A,2B and 2C depending on

the type ofcervical priming induction method used-2A-induced with Foley Cathetor,2B-induced with Dinoprost Gel and 2C-induced with Tab.Misoprostol 25µg.The relevant information of the subjects and their follow up are noted down in a pre designed proforma as attached in Annexures . Management of labour was at the discretion of the labour ward team on duty.Clinical findings of the senior most Medical Officer or Senior resident was recorded for the study.

In Group 1 subjects with a favourable cervix,labour was allowed to progress either spontaneously or augmented with Artificial Rupture of Membranes and use of Oxytocin and a combination of both.

In Group 2A subjects no-16 Foley cathetor was inserted under strict aseptic precautions by direct visualisation with the assistance of a speculum and the balloon was inflated with60ml of distilled water and retracted into the cervical os to facilitate the balloon resting on the internal cervical os and the cathetor was taped to the patient's inner thigh.They are closely monitored for maternal vital signs,progress of labour and fetal heart rate by intermittent auscultation.spontaneous expulsion of ballon was awaited or any balloon in vagina removed during pervaginal examination after 12 hrs of insertion.

In Group 2B labour was induced by application of Dinoprost Gel 0.5mg(PGE2) in to the posterior fornix under strict aseptic precautions and direct visualisation using a speculum.women is allowed to be in supine position for 30 min. They are closely monitored for maternal vital signs,progress of labour and fetal heart rate by intermittent auscultation.In cases of inadequate uterine action,the dose is repeated every 6th hrly for a maximum of 3doses in 24Hrs.In Group 2C labour was induced by Tab.Misoprostol (PGE1)25µg kept per vaginally and the dose repeated every 4-6th Hrly for a maximum of 6 doses.In subjects with Premature Rupture Of Membranes,tablet is given orally.

In all the three methods,when cervix is ripened without adequate uterine action,augmentation of labour is done with Oxytocin(in not less than 4hrs of induction).Oxytocin drip is prepared by adding 2.5U Oxytocin to 500ml of Ringer Lactate solution,labelled and started at a rate of 10 drops per minute and increased every 30 min by 10 drops till 60 drops/min until adequate uterine contrations are achieved.If still there is no adequate uterine action,second drip is prepared by adding 5U Oxytocin to 500ml of Ringer Lactate solution,labelled and started at a rate of 30 drops per minute and increased every 30 min by 5 drops till 60 drops/min.

In any of the groups at any stage in case of fetal distress or uterine abnormality or any side effects noted,induction is stoped and decision for cesarean delivery considered at the discretion of the consultant obstetrician.

For the study purpose,uterine action was considered satisfactory if 2-3 contractions occur in 10 min period and each contraction lasts for >30 seconds and unsatisfactory if the above said criteria was not satisfied.

Tachysystole was defined as >5 contractions per 10 minute period averaged over 30 min window.This is further sub divided in to two categories, one with and one without fetal heart rate changes.

Non Reassuring Fetal Heart Rate was confirmed using CTG when the non reactive pattern occurs.Failed Progression of labour is defined as lack of progressive cervical dilatation or lack of fetal descent and abnormal labour pattern as follows-

- Prolonged latent phase->20hrs in nulliparous women and >14hrs in multiparous women
- Protracted active phase dilatation- <1.2 cm/hr in primigravidae and <1.5 cm/hr in multigravidae
- Protracted descent in active phase- <1cm/hr in primigravidae and <2 cm/hr in multigravidae
- Secondary arrest of dilatation for >2hrs
- Secondary arrest of descent in second stage of labour for >1hr.

Statistical analysis

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. The following assumptions on data was made,

Analysis of variance (ANOVA) has been used to find the significance of study parameters between three or more groups of patients, paired sample t-test has been used to find the significance pairwise groups.Chi-square has been used to find the significance of study parameters on categorical scale between two or more groups and calculates relative risk for complications of patient

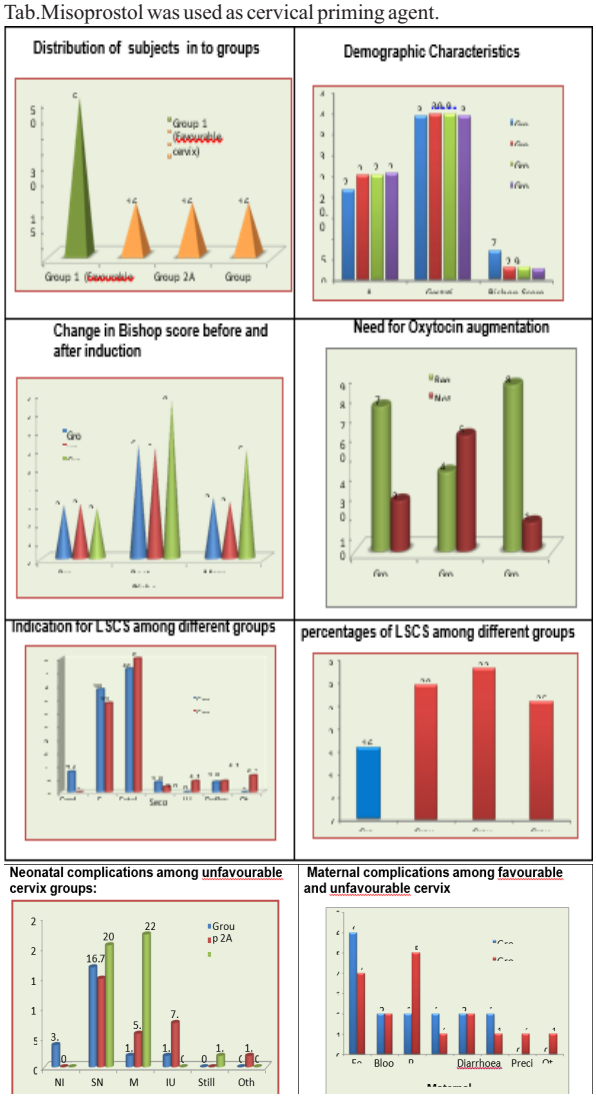
Significant figures

+ Suggestive significance (P value: 0.05<P<0.10)
* Moderately significant (P value:0.01<P≤0.05)
** Strongly significant (P value: P≤0.01)
For all tests, two sided p levels <0.05 were considered as statistically significant.

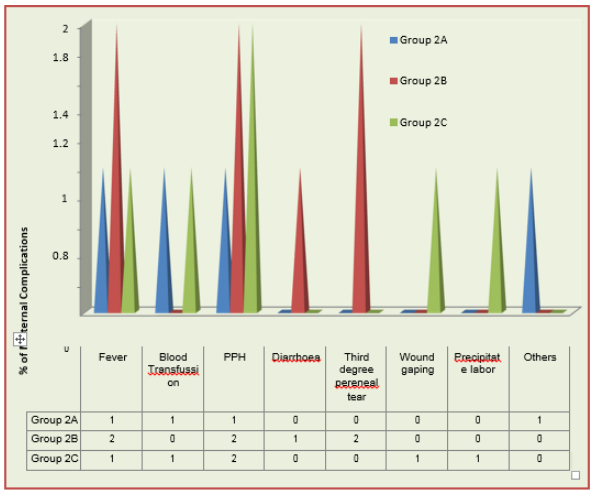
Statistical software: The Statistical software namely SPSS 21.0, , MedCalc 9.0.1, and Systat 12.0 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc

RESULTS

This study was performed on 324 mothers,who fulfilled the inclusion criteria mentioned (after excluding 6 subjects who left against the medical advice,5subjects who were excluded because of confounding factors like nonspecific interventions,change in presentations of fetuses)who were admitted to Government Maternity Hospital affiliated to the Department of Obstetrics and Gynaecology,Sri Venkateswara Medical College Tirupathi.The mothers with favourable cervix(Bishop score >=5) were included in Group 1,which consisted of 162 mothers.The mothers with unfavourable cervix (Bishop score <5) were included in Group 2 which were further classified in to 3 sub groups.Group 2A consisted 54 mothers in whom induction was done using Foley catheter.Group 2B consisted of 54 mothers in whom induction was Dinoprost Gel was used as a cervical ripening agent.Group 2C consisted of 54 mothers in whom Tab.Misoprostol was used as cervical priming agent.



PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr



	Fever	Blood Transfussion	PPH	Diarrhoea	Third degree perineal tear	Wound gaping	Precipitate labor	Others
Group 2A	1	1	1	0	0	0	0	1
Group 2B	2	0	2	1	2	0	0	0
Group 2C	1	1	2	0	0	1	1	0

Maternal complications among unfavourable cervix groups

SUMMARY

- Out of 324 subjects studied,162 subjects had favourable cervix with Bishop score≥5 and 162 subjects had unfavourable cervix with Bishop score <5 among whom 54 were induced with Foley catheter,54 with Dinoprost Gel,54 with Tab.Misoprostol 25µg.The risk of cesarean delivery among the unfavourable cervix group compared to favourable cervix and the efficacy of induction methods used in unfavourable cervix were studied.
- The cesarean section rate was 16% among favourable cervix group and 29.6% in unfavourable cervix group which was significantly higher.
- The relative risk for cesarean delivery in unfavourable cervix is 1.96 times more compared to favourable cervix which is significant.
- The most common indication for LSCS is Fetal distress among both the groups(46.15% in favourable cervix and 50% in unfavourable cervix).
- Those mothers with Bishop score ≥7 delivered within 4hrs of admission.
- Induction with Foley catheter had significantly lesser Induction to Active Phase Interval(7.09±3.638hrs)andInductiontod e l i v e r y interval(13.42±3.659hrs)compared to other two groups.It had fewer neonatal and maternal complications but the difference was not significant.
- Significant change in pre and post induction Bishop score was observed with Misoprostol (5.93±1.071hrs) and it had lesser cesarean section rate (25.9%)But highest Neonatal complications seen(44.4%)most of them attributed to Meconium incidence (22.2%).
- The most common indication for induction among all three unfavourable cervix groups is past dates(28.4%).
- The most common indication for induction among Foley's group (35.2%) and Dinoprost Gel group(31.5%) was past dates. Premature Rupture Of Membranes (51.9%)was the most common indication in Misoprostol Group.
- The need for oxytocin augmentation was highest for Misoprostol group(85.2%).
- There was one still birth among favourable cervix group and one in unfavourable cervix group.
- Neonatal and maternal complications were more in unfavourable cervix groups compared to favourable cervix groups and among the sub groups of unfavourable cervix,Neonatal complications were highest in Misoprostol group and Maternal complications were highest in Dinoprost Gel group.Both Maternal and Neonatal complications were least in Foley's Induction Group.

CONCLUSION

The present study suggests that there is a significant increase in the risk of cesarean delivery in induction of labour with unfavourable cervix compared to those with favourable cervix.The mothers presenting with unfavourable cervix to be considered as high risk as they have relatively more number of cesarean sections and the decision to undertake induction in them needs to be clear and clinically justified.more vigilance during the management of labour and development and practice of effective institutional induction protocols help in reducing primary cesarean section rate.Induction with Foley catheter found to be effective method in unfavourable cervix in terms of lesser Induction to active phase interval,Induction to delivery interval,neonatal and maternal complications.

The low cost,stability in room temperature makes it an ideal method for cervical ripening in developing countries.In those presenting with very low Bishop score and in those with premature rupture of membranes,Misoprostol found to be effective in terms of significant change in pre and post induction Bishop scores and lesser cesarean delivery rate.But highest incidence of Meconium is seen in this group.Further research is needed with larger sample size involving different institutions and research on the preventive aspects of cesarean section in unfavourable cervix .

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