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Maternal and fetal outcome and complications of spontaneous VS induced Labour at term in primigravida

Dr. Akalyaa K[1], Dr. Kavitha BL[2], Dr. Sreelatha S[3]
[1, 2] Junior Resident, Department Of Obstetrics, ESIC Medical College, Rajaji Nagar, Bangalore, Karnataka, India
[3] Professor, Department Of Obstetrics, ESIC Medical College, Rajaji Nagar, Bangalore, Karnataka, India

Abstract
Background: Induction of labour is artificial initiation of uterine contractions prior to spontaneous onset leading to progressive dilatation and effacement of cervix with the aim of achieving vaginal delivery. It is indicated when benefits to mother or foetus outweighs the benefits of continuing the pregnancy
Aims and objectives: The main objective of this study is to determine the influence of induction of labour on mode of delivery and other associated pregnancy outcome and complications in patients with spontaneous and induced labour at term in primigravida
Materials and methods: A randomized comparative study conducted in 200 patients at the Department of Obstetrics and Gynaecology at ESIC MC PGIMSR. Of which 100 patients are taken who goes into spontaneous labour and another 100 patients who are induced with Cervi prime gel (PGE2) or misoprostol (PGE1). Data collected including maternal age, foetal weight, bishops score, period of gestation, foetal Apgar score, rate of caesarean delivery, rate of instrumental delivery and its complications are compared in both the groups
Results: Of all the induced patients, 44 patients were delivered vaginally, 9 patients delivered with instrumentation and 47 by caesarean delivery and the indication for induction being post datism (59%) and IUGR with fetoplacental insufficiency (10%). Out of the 47 LSCS, the indication for caesarean delivery is foetal distress 20(42%) and failed induction 17(36%). In the spontaneous labour group 49 patients delivered vaginally, 13 patients needed instrumental delivery and LSCS done in 38 patients. Indication for LSCS is fetal distress is 18(47%) and cephalopelvic disproportion 11(28%).
Conclusion: We conclude form the study that the need for induction of labour is more in high risk pregnancies and caesarean section is indicated in high risk cases which can be decreased by proper labour monitoring with partogram but it does not adversely affect the neonatal outcome and maternal complications in labour.

Keywords: Induction of labour, caesarean delivery, maternal complications, neonatal outcome, Apgar score

Introduction

The ultimate outcome of good obstetric care is the delivery of a healthy baby with a healthy mother. To achieve this a meticulous planning of antenatal care and delivery is unanimous. When the benefits of delivery outweighs the continuation of pregnancy the need for induction of labour arises. If a delivery has to be affected before its spontaneous onset, a good induction protocol will help to avoid the need of early intervention by cesarean delivery. Over recent decades, more and more pregnant women around the world have undergone induction of labour. In the developed countries, up to 255 of all deliveries at term, now involve induction of labour. In developing countries, the rates are generally lower, but in some setting, they have been found to be as high as 30% [1].

The World Health Organization (WHO) recommends induction of labour to be performed only with a clear medical indication and when expected benefits outweighs potential harm [2]. carefully planned IOL will promote vaginal deliveries there by decreasing the cesarean rates. Isolated Indian data regarding epidemiology of IOL is scarce though there are several studies available for methods of induction. However, guidelines are in need in view of wide and large geographic region and further research is required to study physician and patient factor contributing to the elective induction rate, cost effectiveness and induction practices at various levels of small facilities and the community and regional cultural practices. With all the scientific advances, the techniques should be introduced that replicate the natural child birth process successfully and safely.

WHO Global Survey on Maternal and Perinatal Health, which included 373 healthcare facilities in 24 countries and nearly 300 000 deliveries, showed that 9.6% of the deliveries involved labor induction [1]. Rate of induction in India being reported as 11.4% (Misra and Vavre, 1994). Rate of elective induction of labor is at rapid rise, more rapidly than the overall induction of labor. There is scarcity of literature comparing spontaneous versus induced labour among nulliparous women. According to most authorities, the best way to monitor labour is with the help of a partograph. inducing labor may also pose risks such as uterine hyper stimulation, infection, rupture uterus, cord prolapse, iatrogenic prematurity and failed induction resolved by caesarean delivery. Hence it is imperative to determine the potential outcomes

associated with elective induction of labor. Elective induction of labor means initiation of labor at term pregnancy without any acceptable medical or obstetric indication

As induction has both advantages and disadvantages this study was undertaken to compare the maternal and fetal outcomes of both induced and spontaneous labour

The main objective of this study is to determine the influence of induction of labour on mode of delivery and other associated pregnancy outcome and complications in patients with spontaneous and induced labour at term in primigravida.

Methods

This is a prospective observational study conducted at ESIC Medical College and PGIMSR, Rajaji Nagar, Bangalore. The study population consists of 100 subjects in the induced group (group A) And 100 subjects in the spontaneous labour group (group B) conducted from June 2018 to December 2018.A written informed consent was obtained from each subject participating in the study. Those who matched with the inclusion criteria were induced with prostaglandins of PGE1 or PGE2 and they constitute the induced group. Spontaneous labor is labor in the absence of pharmacologic or mechanical initiation. Bishop score, gestational age, maternal age, birth weight was analyzed and compared with duration of labor, mode of delivery, if caesarean section, indication for caesarean section. Maternal intrapartum and post-partum complications and fetal outcome were also analyzed in both the groups. Statistical analysis of data was carried out using SPSS statistical software. Quantitative data were analyzed with mean, median and standard deviation and analyzed with percentages. The significance in difference between the 2 groups were assessed with cross tables, chi square test where ever necessary.

The inclusion criteria for this study includes Singleton live foetus with Cephalic presentation, Gestational age between 37 weeks to 42 weeks, Prelabour rupture of membranes are included, High risk pregnancies which requires induction of labour and patient's willingness to participate in the study. The exclusion criteria include non-cephalic presentation, twin gestation, intrauterine death, congenital anomaly, previous uterine surgeries, antepartum haemorrhage.

Statistical analysis

The obtained data was analyzed, coded and entered. The data was statistically analyzed using SPSS software using tests like Chi-square test and unpaired t test.

Results

Total duration of labour among the induced age group is 12 hours and spontaneous age group is 8 hours whereas the mean maternal age is 25.7 years and 25.4 years respectively. The period of gestation is 40weeks and 2 days in induced age group while in spontaneous age group the mean weeks is 39 weeks and 2 days (table 1)

The outcome in both the groups are variable. In the present study, those patients who were induced group A (100 patients), 44 of them had normal vaginal delivery, 9 patients had instrumental delivery, and the remaining 47 patients underwent caesarean delivery.

In spontaneous group B (100 patients), 49 patients delivered normally, 13 instrumental delivery and the rest 38 patients had caesarean delivery. In this study rate of instrumental vaginal delivery is 9% and 13% in induced and spontaneous group.

Table 1: Maternal outcome and characteristic of labour in both groups

Labour outcome	Group A (n=100) INDUCED	Group B (n=100) SPONTANEOUS
Total duration of labour(HRS)	12 ± 2 HRS	8 ± 2 hrs
age	25.7 years	25.4 years
pog	281 days (40 weeks± 2 days)	275 days (39 weeks± 2 days)
mode of delivery		
spontaneous vaginal delivery	44	49
cesarean delivery	47	38
instrumental vaginal delivery	9	13

Table 2: Indication for induction of labour

Indication	No of cases
Postdatism	59
Iugr with fetoplacental insuff	10
Severe preeclampsia	6
Oligohydramnios(3-5cms)	9
gestational diabetes mellitus	4
Prolonged prom	7
non reassuring nst	5

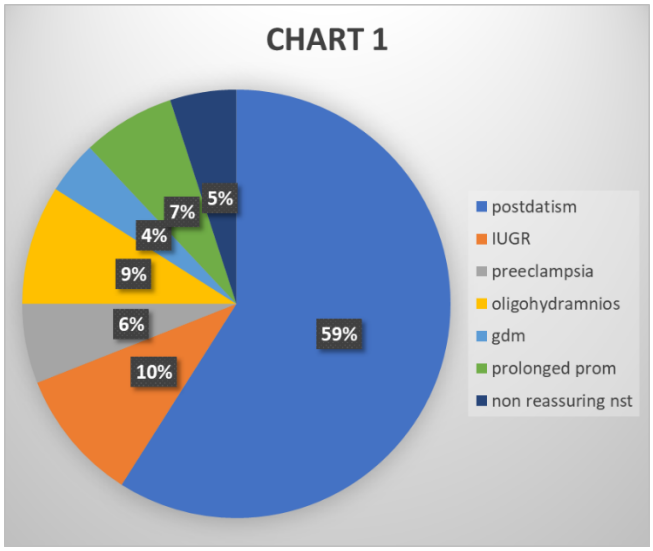

Fig 1

The most common indication for induction is post datism(59%) followed by intra uterine growth restriction(10%). Third most common cause was oligohydramnios (9%).(TABLE 2)

Table 3: Cesarean section rate among induction group

	No of cases	Cesarean rate	Indication for c section
Post datism	59	31(52.2%)	Fd
Iugr with fetoplacental insufficiency	10	4(40%)	Fd
Severe preeclampsia	6	2(33.3%)	Fi
Oligohydramnios	7	3(42.8%)	Fd
Gestational diabetes mellitus	4	1(25%)	Mild cpd
Prolonged prom	9	3(33.3%)	Fd
Non reassuring nst	5	3(60%)	Fi
Total	100	47	

Post datism being the most common indication for induction out of 59 patients induced 31 patients(52%) patients had undergone caesarean section out of 10 patients induced for IUGR and fetoplacental insufficiency 4 patients(40%) were sectioned and the common indication for caesarean section being fetal distress in both.(TABLE 3)

Table 4: Indication for lscs

Indication	Percentage
Fetal distress	20(42%)
Failed induction	17(36%)
Mild cephalopelvic disproportion	6
Deep transverse arrest	1
Non progress of labour	3

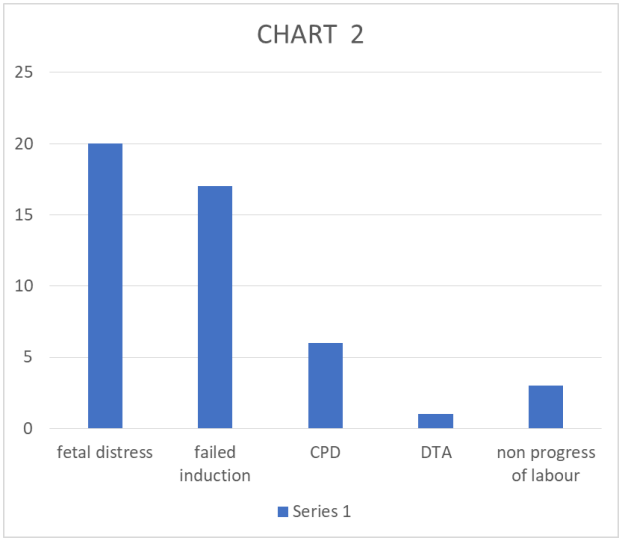

Fig 2

In this study the most common indication for caesarean section is fetal distress is 20 cases (42%) and the 2nd common indication is failed induction 17 cases (36%) followed by non-progression of labour, deep transverse arrest and mild cephalopelvic disproportion.

Table 5: Correlation of bishop score with various mode of delivery

	BISHOP < 6	**BISHOP > 6**
Vaginal	19	25
Instrumental	4	5
Caesarean	29	18

The mode of delivery was compared with the poor Bishop score of < 6 and favourable Bishop score of > 6 and the rate of caesarean section delivery were significantly higher (29) in patients with unfavourable Bishop score and 18 with favourable Bishop score. The rate of vaginal delivery in Bishop score of > 6 is 25.

Outcome in spontaneous labour group

Table 6: Indication for lscs

Indication	**Percentage**
Fetal distress	18(47%)
Mild cephalopelvic disproportion	11(29%)
Deep transverse arrest	5(13%)
Prolonged prom	4(11%)
Total	38

In this study the indication for LSCS is fetal distress 18 cases (47%) followed by mild cephalopelvic disproportion in 11 cases (29%) other causes includes deep transverse arrest in 5 cases(13%) and prolonged prelabour rupture of membranes in 4 cases so from our study we conclude that fetal distress is the most common indication for LSCS in spontaneous labour group also.

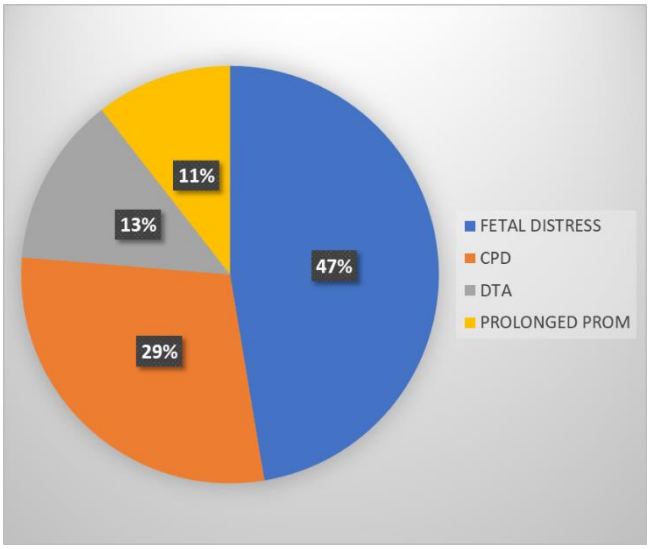

Fig 3

Table 7: Maternal complications

Complications	Group a induced n=100	Group b spontaneous n=100
Nil	93	96
Atonic pph	3	2
Cervical tear	-	-
Episiotomy wound infection	1	-
Perineal tear	3	1
Vaginal tear	-	1

In this study maternal complications were 7% and 4% in the induced and spontaneous labour respectively. Atonic PPH is the most common maternal complication in both the age group 3% and 2% in group A and B respectively

Table 8: Fetal complications and outcome

Fetal complications	Group a induced n=100	Group b Spontaneous n=100
Nil	87 cases	80 cases
Bradycardia	1	4
Early decelerations	-	-
Late decelerations	2	3
Meconium aspiration	-	3
Hyperbilirubinemia	8	8
Respiratory distress	2	2
APGAR	All > 7 at 1 and 5 min	All > 7 at 1 and 5 min

Among the fetal complications, hyperbilirubinemia is the commonest in both group A and group B which includes 8 cases. Meconium aspiration was significantly found in spontaneous labour group seen in 3 cases. There were no significant fetal complications in both the labour group as the APGAR score at 1 and 5 minutes all were more than 7. Respiratory distress were seen in 2 babies in both the groups which needed NICU observations.

Table 9: Relation of birth weight in different modes of delivery

BIRTH WEIGHT	< 2 KGS	2 TO 2.5KGS	2.5 TO 3KGS	3 TO 3.5KGS	> 3.5KGS	TOTAL
VAGINAL	10	9	10	38	26	93
CESAREAN	2	6	12	30	35	85
INSTRUMENTAL	0	4	4	5	9	22

There was a significant relation between birth weight and the mode of delivery in our study, the rate of caesarean section is more when the birth weight is more than 3.5kgs and also instrumentation is higher when the birth weight is higher.

Discussion

- Induction of labour is defined as initiation of uterine contractions preceding their spontaneous onset, leading to progressive dilatation and destruction of the cervix and delivery of the baby [1]. Rate of induction has gradually increased globally. Successful induction is defined as vaginal delivery within 24-48 hours of induction of labour [1]. Elective induction is defined as induction of labour in the absence of acceptable fetal or maternal indication [1].
- In Asian population the common indication for IOL was prolonged pregnancy 19.4% followed by premature rupture of membranes 19.3%.The World Health Organization recommends induction to be performed with a clear medical indication and when benefits outweighs potential harm.In developed countries the rate of induction is 25% where as in developing countries the rate of induction is as high as 30% [2]. The indication for induction of labour includes postdatism, severe oligohydramnios, IUGR, severe preeclampsia and gestational diabetes mellitus. Rate of cesarean section is almost equal in both induced and spontaneous labour group which strongly signifies induction of labour is safe in postdated and high risk pregnancies provided with careful labour monitoring.
- The most common cause for cesarean in both the groups being fetal distress followed by failed induction in induced group and cephalopelvic disproportion in spontaneous age group.Among the high risk pregnancy groups the rate of cesarean section is less than 40% proving that high risk cases are not an indication for emergency LSCS unless complicated and can be managed by timing of induction of labour and careful labour monitoring.We can draw from this study that while induced labour may increase the chances of caesarean section, there is no much difference in post operative recovery, it does not adversely affect the neonatal outcome. Babu S, Manjeera ML concluded that failed induction is the most common cause for LSCS followed by fetal distress [3].
- The rate of cesarean section in induced group is 47% and 38% in spontaneous labour group which is comparable with Babu S, Manjeera ML where the rate in induced women is 51% and 20% in the primiparous spontaneous group [3], In

this study rate of instrumental vaginal delivery is 9% and 13% in induced and spontaneous group. These results are comparable with Prysak *et al* and Peter e *et al* studies where they concluded that instrumental delivery is high in spontaneous labour group [4, 5].

- Sande HA *et al* also found a statistically significant increase in the risk of cesarean section among nulliparous induced women if Bishop score<5 and hence present study is comparable with the same [6].
- In this study maternal complications were 7% and 4% in the induced and spontaneous labour respectively. Macer *et al*, where they found no increase in intrapartum complications with induction of labor [7].
- Cole *et al*, Smith *et al.* and Kato K *et al.* did a comparative study where they concluded tat meconium stained liquor as an indication for cesarean section is found in 3 cases, which accounts for 4.8% in the induced group and among the spontaneous group meconium stained liquor is taken as an indication in 4 cases which accounts to 16.6% [8]. This is explained by hypothesis that fetus in stress induces labor and hence meconium can be observed in cases of spontaneous group than the induced group. Meconium aspiration is more in spontaneous labour group (3 cases) in our study
- The cesarean section rate in the induced group was not statistically higher than the spontaneous group proving that induction per se is not associated with increased cesarean section rate. When it is associated with the risk factors like bishops <6, birth weight of > 3.5kgs the rate of cesarean section is increased. Prysak *et al* in their study they concluded that cesarean section was increased in the population who had significant risk factors such as nulliparity, poor Bishop score, gestational age >287 days, birth weight >3800gms.
- Atonic PPH is the most common maternal complication in both the age group 3% and 2% in group A and B respectively which is comparable with, Babu S, Manjeera ML where the results were same
- Among the fetal complications with the exception of hyperbilirubinemia at early-term gestational ages, there was no other evidence of any other increased adverse maternal or neonatal outcomes with elective induction as concluded by Blair G *et al* which is comparable with our study [9].
- Induced or spontaneous labour has implications on the eventual mode of delivery and maternal as well as neonatal outcome. The cesarean section rates among the induced nulliparous women compared to her spontaneous labor group after excluding the risk factors were comparable [10]. Hence there is no statistically significant increase on cesarean section rates among the induced group when the risk factors are nullified
- We therefore suggest that induced labour can be a safe procedure among nulliparous women if labour is partographically monitored. Also, when labour progress becomes slow in spontaneous labour, a high index of suspicion for cephalopelvic disproportion should be kept in mind.

Conclusion

Conclusion from the study is that the decision for induction of labour should be individualized at appropriate gestational age in high risk pregnancies and it is not contraindicated when labour is partographically monitored, and it does not adversely affect the maternal and perinatal outcome. The rate of caesarean section can be decreased by careful planning of induction of labour and timely decision for cesarean only when indicated.The primary goal is to improve the quality of care for pregnant women undergoing induction of labour by a teamwork of obstetricians, midwives, general medical practitioners, health care workers by adopting good clinical practice recommendations and proper utility of available resources.

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