

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20221940>

Original Research Article

Lustrum study of labour induction

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Received: 13 June 2022

Revised: 05 July 2022

Accepted: 06 July 2022

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ABSTRACT

Background: The rate of labor induction is steadily increasing. Approximately one out of four pregnant women has their labor induced. Over the years, various professional societies have recommended the use of induction of labor in circumstances in which the risk of waiting for the onset of spontaneous labor are judged by clinicians to be greater than the risks associated with shortening duration of pregnancy by induction. This study was carried out to categories indications and to know trends of indication over 5 years.

Methods: This retrospective analytical study was conducted over a period of five years from 01 June 2016 to 31 May 2021 at the department of obstetrics and gynecology, tertiary care hospital, Pune, Maharashtra, India. The rate, indications and trend in indications of labor induction was calculated over the study period. The data so collected was presented with graphical representation.

Results: There was a total of 10407 deliveries during the study period out of which, 865 were induced. So, the rate of labor induction in the study was found to be 8.31%. Post-datism accounts for 54.4% followed by pregnancy induced hypertension remains the major obstetric cause accounting for 16.6% of labour induction. Intrauterine growth restriction (IUGR) accounted for 3.6% causes of labour induction.

Conclusions: Vaginal birth has lesser morbidity and mortality involving both the mother and the child compared to caesarean and will always be regarded as the superior mode of delivery. Apart from post-datism, the commoner obstetric indications for induction of labour are PIH and IUGR. Increasing trend in the incidence of pregnancy-induced hypertension (PIH) and IUGR is observed and therefore probably correlating to foetal distress after induction of labour causing increased trend of need for caesarean section over the five years.

Keywords: Induction, Cesarean, Prostaglandins, PIH, IUGR

INTRODUCTION

Obstetrician induces labor in approximately 25% of pregnant women.¹ Induction of labor implies stimulation of contractions before the spontaneous onset of labor, with or without ruptured membranes. The rate of labor induction is steadily increasing. Approximately one out of four pregnant women has their labor induced.¹ Over the years, various obstetrics and gynecological professional societies have recommended the use of induction of labor in circumstances in which the risk of waiting for the onset of spontaneous labor are judged by clinicians to be greater

than the risks associated with shortening duration of pregnancy by induction.¹

There are different methods used for cervical ripening. Mechanical cervical dilator methods used are membrane stripping, amniotomy, hygroscopic dilators, osmotic dilators (*Laminaria japonicum*), Foley catheters (14–26 F) with inflation volume of 30–80 ml, double balloon devices (Atad Ripener device). Pharmacological drugs like administration of synthetic prostaglandin E1 (PGE1) misoprostol, prostaglandin E2 (PGE2) dinoprostone, oxytocin is used for labour induction. Nipple stimulation,

and extra-amniotic saline infusion using infusion rates of 30–40 ml/h (11–19) and are rarely used procedures nowadays.²

There are potential risks of labor induction like failure of induction leading to caesarean section. Because of untoward complications like intra-partum bleeding, uterine hyperstimulation, fetal distress and uterine rupture, which needs the mother and her baby to be monitored closely.³ When gestation is between 39 weeks 0 days and 40 weeks 6 days, common practice has been to avoid elective labour induction because of a lack of evidence of perinatal benefit and concern about a higher frequency of caesarean delivery and other possible adverse maternal outcomes, particularly among nulliparous women. However, planned time specific delivery by demand of patient and the concept of plan delivery also has increase in number of inductions even if there is no specific indication for induction.³

Most observational studies that have used the clinically relevant comparator of expectant management have not shown a higher risk of adverse outcomes with labour induction; instead, some of these studies have shown that induction of labour resulted in a lower frequency of caesarean delivery and more favourable perinatal outcomes than expectant management.⁴⁻⁸

Caesarean section rates and indications for performing a caesarean section should be reviewed with all patients. There is a strong emphasis on caesarean section rates in the United States both in the medical literature and in the social news. The New England Journal of Medicine (NEJM) recently published a randomized trial of induction versus expectant management (ARRIVE) trial that compared caesarean section rates and perinatal outcomes in nulliparous women undergoing elective induction at 39 weeks gestation to expectant management. Results demonstrated that there was a significantly lower caesarean section rate in the induction group and that there were statistically lower adverse perinatal outcomes too.⁹

As a tertiary care center, we come across many indications for induction of labor due to referred patients for maternal medical disorders who requires multidisciplinary management and fetuses who are with growth restriction requires neonatal intensive care unit (NICU) set up. This study is aimed to find the rate of labor induction and various indications for induction of labor.

Aim

Aim of the study was identifying incidence and trends in indications of labor induction over the lustrum.

Objectives

Objectives of the study were: to identify incidence of labor induction, and to study the trend in indications of labor induction over the 5 years.

METHODS

Study site

The study was conducted at obstetrics and gynecology antenatal and labour ward of Smt. Kashibai Navale Medical College and General Hospital.

Study design

The design of the study was retrospective analytical study.

Study duration

The duration of the study was total 5 years from 01 June 2016 to 31 May 2021.

Inclusion criteria

Patients with induction of labour done beyond 28 weeks of pregnancy were included in the study.

Exclusion criteria

Patients with induction of labour done before 28 weeks of pregnancy, and patients who have been induced in another institute and then referred to labour ward and done for intra-uterine death were excluded.

Methodology

After achieving ethic committee approval, labour room record details of cases were taken who had undergone induction of labour over a period of 5 years. These patients' indoor files obtained from medical record department, details filled in proforma, specific details regarding indication for induction of labour, period of gestation at induction, method of induction used, the mode of delivery, and indication for operative delivery noted. Patients were assessed for induction based on their obstetric history, physical examination, laboratory investigations and progress of labour was assessed by plotting partograph and close foetal heart rate monitoring.

RESULTS

There was a total of 10407 deliveries during the study period out of which, 865 were induced. So, the rate of labor induction in the study was found to be 8.31%. While parity is considered highest number was of primigravida.

486 i.e. 61.67% of women were primigravida, 217 i.e. 27.5% were second gravida and 85 i.e. 10.7% were gravida three and above.

The mean age was 18-35 years. Out of 865 patients induced 17.6% i.e., 153 patients undergone caesarean section while 82.4% i.e., 712 patients delivered vaginally.

Table 1: Age group distribution amongst women induced.

Age group (years)	Number of cases	Percentage
18-20	173	20
21-25	441	51
26-30	224	26
30-35	25	3

Table 2: Distribution of period of gestation amongst women induced.

Period of gestation (weeks)	Number of cases	Percentage
<32	22	2.5
32-37	28	3.2
37-40	345	39.8
40-41	435	50.2
>41	35	4.3

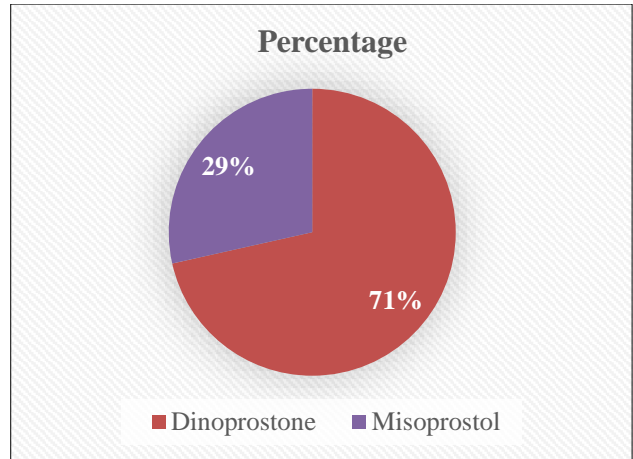


Figure 1: Drug used for labour induction.

Majority of cases had APGAR score (1-min) higher than or equal to 7 and APGAR score (5-min) higher than or equal to 7.

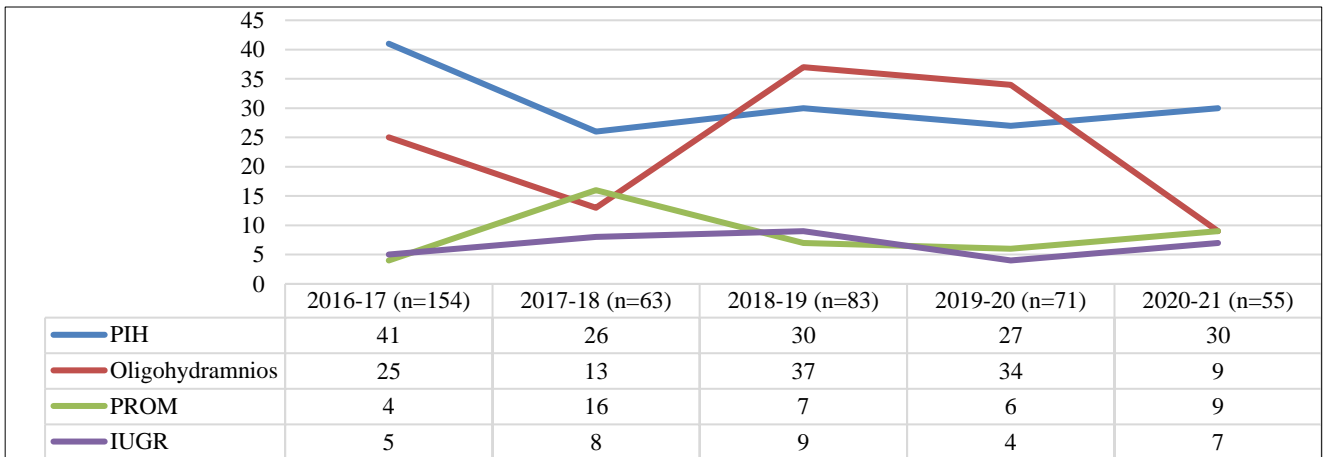


Figure 2: Trends over the lustrum in indications of labour induction.

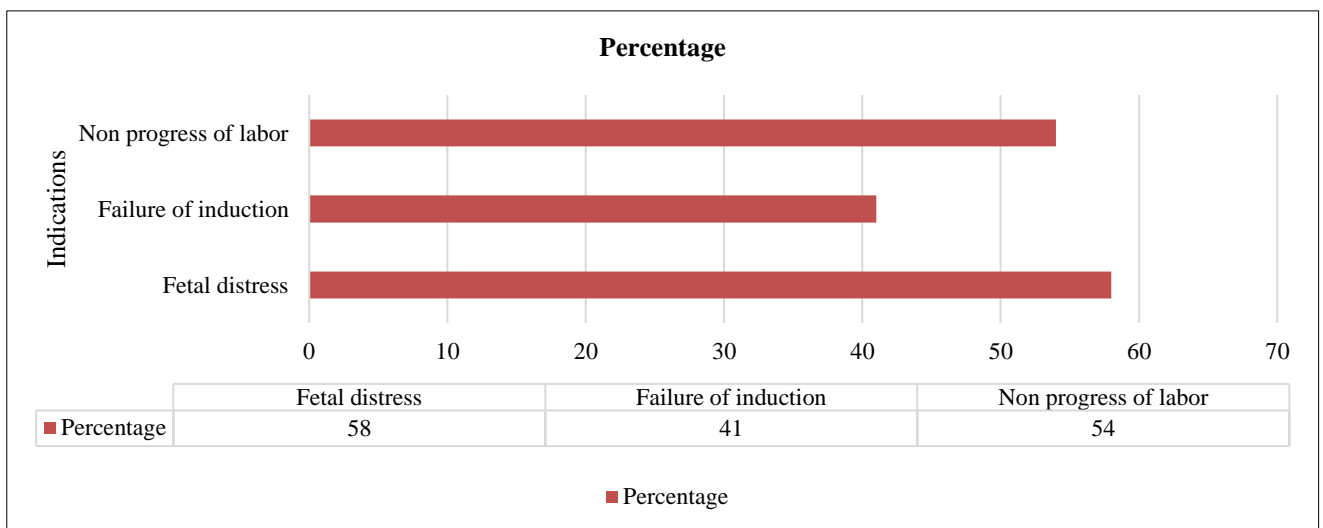


Figure 3: Need for caesarean.

Table 3: Indications of labour induction.

Indications of labour induction	Total	Percentage
Post-datism	470	54.4
PIH	143	16.6
Oligohydramnios	143	16.6
PROM	51	5.9
IUGR	31	3.6
Decreased fetal movement count	3	0.4
GDM	2	0.3
Polyhydramnios	2	0.3

Table 4: Distribution of incidence of maternal complications.

Complications	Percentage
Nil	52
PPH	8
Hyper-stimulation	5
Fever/rigors	5
Nausea/vomiting	28
Perineal tear	2

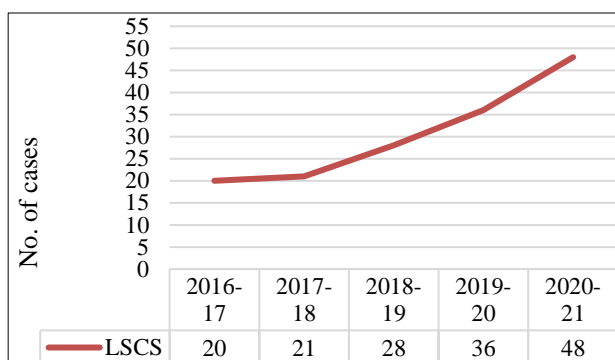


Figure 4: Trend of caesarean over the lustrum.

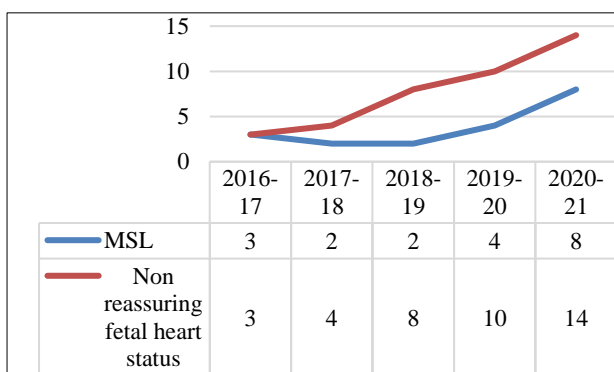


Figure 5: Trends in foetal complications.

DISCUSSION

Our study shows that post-datism is the most common cause for induction of labour and the findings are similar

to the study done by Chawla et al and most of the studies done earlier. The second common indication for induction of labour being PIH similar to the study done by Chawla et al.¹⁰

Table 5: Induction rates in our and other studies.

Study	Year	Incidence in %
Present study	2016-2021	8.31
Chawla et al ¹⁰	2016	23.9
Paterson et al ¹¹	1990-2008	12.5
Brun et al ¹²	2016	39
Lueth et al ¹³	2017	9

Demographic characteristics showed 51% women were aged between 21-25 which is similar to 56% women aged between 21-25 years in a study done by Chawla et al. 61.67% of women from our study were primigravida while nearly 53% of women were primigravidae from study done by Chawla et al. In our study nearly 50.2% and 39.8% of women were induced at POG 40-41 weeks and 37-40 weeks compared to 39.6% and 54.7% at respective gestational age in study done by Chawla et al.¹⁰

The method of choice for induction of labour has varied in different studies, WHO has recommended the use of prostaglandins for induction and among PG's, tablet "misoprostol" being cheap and not requiring special storage conditions has been studied in the unscarred uterus for induction in various trials.¹⁰

According to Cochrane systematic review by Mozurkewich et al vaginal misoprostol is more likely to result in vaginal delivery within 24 hours reducing the likelihood of caesarean delivery than vaginal or cervical PGE2 but is associated with increased uterine hyperstimulation. Oral misoprostol reduced caesarean sections compared with vaginal PGE2. Compared with vaginal misoprostol, oral misoprostol is associated with fewer contractile abnormalities, but more need for oxytocin augmentation.¹⁴

In our study, we had used prostaglandins for induction of labour as the method of choice.

Majority of cases had APGAR score (1-min) higher than or equal to 7 and APGAR score (5-min) higher than or equal to 7 as compared to study by Lueth et al where 10.9% neonates had less than 7 (1-min) and (5-Min) APGAR score.¹³

The mean induction to delivery time of cases studied was 9-12 hours. According to Cochrane systematic review by Mozurkewich et al vaginal, cases induced with prostaglandins delivered within 24 hours.¹⁴

A comparison of oxytocin with other drugs to induce labour (vaginal or intracervical prostaglandins) showed

that women were more likely to have their babies within 24 hours with prostaglandin.¹⁵

The use of oxytocin alone was associated with fewer vaginal births not achieved within 24 hours of induction of labour (three trials, 399 participants, RR 0.16, 95% CI 0.1–0.25), fewer admissions to a neonatal intensive care unit (seven trials, 4387 participants, RR 0.79, 95% CI 0.68–0.92), and increased risk of caesarean section.¹⁵

Induction of labour is probably the most common interventional procedure in obstetrics. Guerra et al reported an elective induction rate of 16.7% in Latin American facilities, while we found nearly 50% of inductions in Asian facilities were elective, highest being in Sri Lanka (77.2%).^{13,16} This is followed by Thailand (44.6%), Japan (41.0%), India (32.1%) and China (20.4%).¹³ However, at our facility elective induction of labour is not performed. Induction of labour in our institute is always done with indication.

Limitations

The limitation of this study is smaller sample size as for more accurate results a larger sample size is desirable.

CONCLUSION

Vaginal birth has lesser morbidity and mortality involving both the mother and the child compared to caesarean and will always be regarded as the superior mode of delivery. Apart from post-datism, the commoner obstetric indications for induction of labour are PIH and IUGR. Increasing trend in the incidence of PIH and IUGR is observed and therefore probably correlating to increase in foetal distress after induction of labour causing increased trend of need for caesarean section over the five years.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Sawant PP, Chaudhari SN, Hol K, Shastri S. Lustrum study of labour induction. *Int J Reprod Contracept Obstet Gynecol* 2022;11:2218-22.