

A Study Of Induction Of Labour At Tertiary Care Teaching Hospital

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Abstract: Background: In this era where safe obstetrics practice to ensure good maternal and fetal outcome is being performed, more and more ways to fore start the labor in unfavourable conditions is being practiced. For such reasons, induction of labor is becoming one of the commonest obstetric procedures nowadays. Over the decades the incidence of induction of labor has raised exponentially. In developed countries the rate being 20-25% while in developing countries the incidence varies around 10%³. Induction of labour can be carried out through various methods either surgical/medical methods. Most commonly prostaglandins like PGE1 or PGE2 is used either orally/per vaginally. This study is aimed to analyse the fetomaternal outcome of patients undergoing induction of labour. Material And Methods: A prospective observational study was carried out in the obstetrics and gynaecological department of Smt. SCL general hospital, Smt. NHL Municipal Medical College from November 2021 to April 2022. All the details of the included cases were noted including (obstetric score, details of antenatal period as per the predetermined proforma. All routine investigations were carried out like complete blood count, blood group, ultrasound and covid-19 RTPCR/Rapid antigen test. All the details were tabulated and analyzed. Result: A total of 320 patients were included during the study period at out tertiary care center from November 2021 to April 2022. In our study the majority of the patients belong to the age group of 20-30 years and are gravida 2 or 3 patients showing that maximum parity is in the reproductive age group of the patients. Induction of labor can be carried out by various methods, out of which the above-mentioned methods were taken into consideration. The desirable method for varying maternal situation was taken into consideration following critical analysis of each situation (i.e. Bishop's score, effective contraction). The delivery induction interval for varying methods of induction of labour has been described in the above table. In our present series it was observed that majority of the patients (40.9%) delivered within 12-24 hours of induction. About 31% of patients delivered had a successful vaginal delivery post induction of labor whilst 30% underwent caesarean section owing to various reasons. Out of the 320 patients observed, 22 patients developed complications. Postpartum haemorrhage was observed in 10 of these patients. 13% of the neonates required NICU admission. The main reason for admission was seen to be Meconium aspiration syndrome pertaining to the hyper stimulation caused by induction of labor. Conclusion: Healthy mother with health baby is the ultimate goal to be achieved by any means of delivery. Understanding the physio-pharmacology of labour help clinicians to manage the process more efficiently and modify the process when required, by the use of pharmacological agents to stimulate or initiate labour. Through our study it was observed that induction of labour in necessary conditions helps us in achieving the said goal. Though the risk benefit ratio of induction of labour may exceed in some situations the overall risk ratio of induction of labour remains low. Caesarean section rates also do not increase with induction of labour. [Shah D Natl J Integr Res Med, 2023; 14(2): 16-21, Published on Dated: 15/03/2023]

Key Words: Induction, Caesarean Section, Postdatism, Prostaglandins, Meconium Aspiration Syndrome

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Introduction: In this era where safe obstetrics practice to ensure good maternal and fetal outcome is being performed, more and more ways to fore start the labor in unfavourable conditions is being practiced. For such reasons, induction of labor is becoming one of the commonest obstetric procedures nowadays. Artificial initiation of contractions in an otherwise quiescent uterus by any surgical, medical or

combined methods prior to their spontaneous onset is known as "Induction of Labor". Since every procedure has its own pros and cons; induction of labor has its own complications. Thus, as stated by WHO, Induction of labor should only be carried out when there is clear medical indication and when expected benefits outweigh potential harms¹. Over the decades the incidence of induction of labor has risen

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exponentially. In developed countries the rate incidence varies around 10%. Induction of labour in the absence of foreseeable medical reasons is known as Elective induction. After 41 weeks of gestation, it is associated with a small reduction in perinatal deaths and meconium aspiration syndrome². However, elective induction should not be performed before 39 weeks gestation, as perinatal outcomes are less favourable³. Induction of labour can be carried out through various methods either surgical/medical methods. Most commonly prostaglandins like PGE1 or PGE2 is used either orally/per vaginally.

This study is aimed to analyse the fetomaternal outcome of patients undergoing induction of labour.

Material & Methods: A prospective observational study was carried out in the obstetrics and gynecological department of Smt. SCL general hospital, Smt. NHL Municipal Medical College from November 2021 to April 2022. Inclusion Criteria: Patients who delivered post induction at the current institute as well as the patients who gave permission for their enrollment in this study along with following conditions:

being 20-25% while in developing countries the

- Maternal Age >19 Years And <40 Years,
- Patients Having Postdatism
- Singleton Pregnancy,
- Premature Rupture Of Membranes (Prom),
- Patients Having Hypertensive Disorders Of Pregnancy
- Intra Uterine Fetal Death (IUFD)
- Fetal Congenital Anomalies.

Exclusion Criteria: Patients having severe oligohydramnios, previous caesarean section, Intra uterine growth restriction, and the women who were not willing for participation. All the details of the included cases were noted including (obstetric score, details of antenatal period as per the predetermined proforma. All routine investigations were carried out like complete blood count, blood group, ultrasound and covid-19 RTPCR/Rapid antigen test. All the details were tabulated and analyzed.

Results: A total of 320 patients were included during the study period at out tertiary care center from November 2021 to April 2022.

Table 1: Maternal Variables In Present Series

Maternal Variables	No.	Abisiwomo Et Al
Gravidity		
PRIMI	116(36.2%)	126(57.2%)
2-3	148(46.2%)	054(24.5%)
>3	056(17.5%)	040(18.1%)
Age		
<20 Years	015(4.68%)	006(2.7%)
20-30 Years	296(92.5%)	194(88.1%)
>30 Years	009(2.81%)	020(9.09%)
Booking Status		
Booked	298(93.1%)	207(94%)
Unbooked	022(6.87%)	013(5.9%)

Table 2: Distribution Of Patients According To The Methods As Well As Indications Of Induction Of Labour

Indications For Induction	Methods Of Induction Of Labour				Gupta Et Al
	By Misoprostol	By Dinoprostone Gel	By Mechanical Dilatation	By Combined Approach (Dinoprostone Gel+Mechanical Dilatation)	
PROM	020(24%)	098(44.5%)	001(10%)	000(0%)	023(33.8%)
POSTDATISM	032(38%)	052(23.6%)	002(20%)	000(0%)	031(45.5%)
IUFD/GCA BABY	005 (6.02%)	030 (13.6%)	007 (70%)	007 (100%)	000 (0%)
HYPERTENSIVE DISORDERS OF PREGNANCY	012 (14.4%)	025 (11.3%)	000 (0%)	000 (0%)	014 (20.5%)
ELECTIVE INDUCTION	014 (16%)	015 (6.8%)	000 (0%)	000 (0%)	000 (0%)
TOTAL	083(25.9%)	220(68.7%)	010(3.1%)	007(2.1%)	068

In our study the majority of the patients belong to the age group of 20-30 years and are gravida 2

or 3 patients showing that maximum parity is in the reproductive age group of the patients.

Table 3: Induction Delivery Interval In Respect To Various Methods Of Induction Of Labor

Methods Of Induction	Induction Delivery Interval				Reshme Et Al			
	<12 Hours	12-24 Hours	>24 Hours	Reinduction	<12 Hours	12-24 Hours	>24 Hours	Reinduction
By Misoprostol	036 (34.1%)	033 (24.6%)	012 (36.92%)	002 (11.7%)	-	-	-	-
By Dinoprostone Gel	068 (65.3%)	092 (68.65%)	045 (69.23%)	015 (88.2%)	22 (29)	31 (41%)	22 (29%)	-
By Mechanical Dilatation	000 (0%)	006 (4.4%)	004 (6.15%)	000 (0%)	2 (2.5%)	49 (63%)	26 (33%)	-
By Combined Methods	000 (0%)	003 (2.2%)	004 (6.15%)	000 (0%)	-	-	-	-
Total	104 (32.5%)	134 (41.8%)	065 (20.3%)	017 (5.3%)	024	080	048	-

Induction of labor can be carried out by various methods, out of which the above-mentioned methods were taken into consideration. The

desirable method for varying maternal situation was taken into consideration following critical analysis of each situation (i.e. Bishop’s score, effective contraction).

Table 4: Mode Of Delivery In Present Series

Mode Of Delivery	Number	Sinha Et Al
Normal Delivery	222(69.3%)	302(78%)
Caesarean Section	096(%)	086(22%)

The delivery induction interval for varying methods of induction of labour has been described in the above table. In our present series it was observed that majority of the patients (40.9%) delivered within 12-24hours of induction. About 31% of patients delivered within

less than 12 hours. The need for reinduction was seen in 5% patients.

About 69.3% had a successful vaginal delivery post induction of labor whilst 30% underwent caesarean section owing to various reasons.

Table 5: Maternal Outcome

Maternal Outcome	Number
Post Partum Haemorrhage	10
Vaginal Tear/Lacerations	4
Failure Of Induction	3
Wound Infection	5

Out of the 320 patients observed, 22 patients developed complications. Postpartum haemorrhage was observed in 10 of these patients.

Table 6: Fatal Outcome

Perinatal Outcome	Nd	Cs	Acharya Et Al
NICU Admission			
1.Meconium Aspiration Syndrome	005(21.7%)	018(42.8%)	064(49.2%)
2.Birth Asphyxia	007(70%)	003(30%)	028(21.5%)
3.Sepsis	002(40%)	003(60%)	-
4.Prematurity	001(50%)	001(50%)	-
APGAR Score			
1.<5 At 5 Minutes	001(0.43%)	001(0.43%)	-
2.>5 At 5 Minutes	220	095	-
Live Birth	221	096	231
Still Birth	001	000	000

Discussion: In present study, majority of the patients belonged to the age group of 20-35 years (95%). Similar findings were observed by Abisiwomo et al where 85% were of the mean age of 28 years⁴. Findings are concurrent with the mean age of reproductive life period.

Majority of patients undergoing induction of labour within our study period were having PROM (Premature rupture of membranes) (37 %) followed by postdatism (24%). However, Gupta et al as well as Aherwar et al observed that postdatism was the most common indication for induction of labour followed by premature rupture of membranes^{2,5}.

Dinoprostone gel was used in majority of patients with PROM with favourable Bishop's score. Dinoprostone gel is a PGE2 type of prostaglandin.

Prostaglandins are efficient in both cervical ripening as well as in inducing labour. They help in changing the cervical smooth muscle fibres and matrix from a sol state to a gel state as well as increases the accumulation of hyaluronic acid and Glycosaminoglycans (GAG).

Multiparous patients with postdatism were seen to have previous history of postdatism as well as labour induction. Mechanical dilatation alone or when combined with Dinoprostone gel was proven very effective in induction of labour for IUFD/GCA babies. In situations where favourable bishop's score was missing misoprostol induction was carried out giving promising results. The

mean induction delivery interval was seen to be of <12 hours in 40.9% of patients. The need for reinduction was observed more frequently with that of Dinoprostone gel as compared to misoprostol induction.

Reshme et al also observed that 29.33% of patients delivered within 12 hours of induction with Dinoprostone gel⁶. Misoprostol induction causes hypercontractility and early effacement of cervix leading to prompt delivery. The need for reinduction was also noticed in patients having a longer duration of premature rupture of membranes to that of induction. Patients having >12 hours of PROM with unfavourable bishop's score were in more need of reinduction.

Pertaining to maternal outcome, 69.3% had vaginal delivery whereas 30% underwent LSCS. Sinha et al recorded similar observations⁷. Thus, stating that induction of labour does not increase the percentage of caesarean section. Those who underwent caesarean section, the major cause owed to foetal distress followed by non-progression of labour in some. However, with rigorous intrapartum monitoring successful vaginal deliveries can easily be obtained in induced patients.

Lamichanne et al also observed that 67.7 % patients underwent a successful vaginal delivery as compared to 32% patients who had caesarean section⁸. The most common complication observed was postpartum haemorrhage in 10 patients out of all 320 patients. Abisowomo et al

and Pandit u et al noticed that 6 patients underwent postpartum haemorrhage^{4,9}.

Postpartum haemorrhage maybe accounted to the increased hyperstimulation caused by induction leading to improper contraction post-delivery. However, with the help of uterotonic agents such mere complication can be put to ease. Failure of induction was witnessed in 3 patients.

Failure of induction is defined as failure to enter active stage of labour after 24 hours of induction of labour with one cycle of Dinoprostone gel (2 doses). Failure of induction may pertain to the unfavourable bishop's score rather than the pharmacological agent. 13% of the neonates required NICU admission.

The main reason for admission was seen to be Meconium aspiration syndrome pertaining to the hyperstimulation caused by induction of labor.

Similar findings were present in the study Acharya T et al where 49% neonates had meconium aspiration syndrome¹⁰.

A study by Hofmeyr and Gülmezoglu et al also suggests that even though administration of misoprostol increases the passes of meconium in the foetus, neonatal adverse effect is less even at higher doses¹¹.

Many other studies have reported that there is an increase of risk for stillbirth and perinatal mortality after 41 weeks of gestational age.

Conclusion: Healthy mother with health baby is the ultimate goal to be achieved by any means of delivery. Understanding the physio-pharmacology of labour help clinicians to manage the process more efficiently and modify the process when required, by the use of pharmacological agents to stimulate or initiate labour¹¹. Hence, the aim of induction is to pharmacologically intervene a physiological process to mimic the natural process as closely as possible. Through our study it was observed that induction of labour in necessary conditions helps us in achieving the said goal. Though the risk benefit ratio of induction of labour may exceed in some situations the overall risk ratio of induction of labour remains low. Caesarean section rates also do not increase with induction of labour. Thus, as stated by the RCOG Guidelines,

induction of labour is indicated when it is agreed that the foetus or mother will benefit from a higher probability of a healthy outcome than if birth is and the process of induction of labour should only be considered when vaginal delivery is felt to be the appropriate route of delivery¹³.

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