

Induction of Labour-Solution of Many Problems; One Year Experience in Gynae C Unit Ayub Teaching Hospital

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Abstract

Objective: To observe the success rates of different methods of labor induction in relation to various modes of delivery and outcomes and to identify successful inductions where patients progress into labor.

Methodology: This descriptive cross-sectional study was carried out at the Gynecology C Unit, Ayub Teaching Hospital, and Abbottabad, Pakistan from Dec 2021 to Nov 2022. Inclusion criteria was all pregnant patients with gestational age from 28 to 42+6 weeks, singleton, and cephalic needing induction of labor for different indications while patients with previous caesarean section and non-cephalic presentations were excluded from this study. Structured Performa was used for data collection. Consent from the patient to enter the study was obtained verbally. The identity and personal information of patient was kept confidential.

Results: A total of 204 patients were induced, out of which 92.1% were successful inductions and 8.82% were failed inductions. About 81% patients delivered vaginally, and 18.6% were delivered through caesarean sections. Out of 204 patients induced, 106 inductions were done with pharmacological means (Dinoprostone), among which 48% were successful and 3.9% were failed. 95 inductions were done with both pharmacological plus mechanical methods, among which 42.6% were successful and 3.9% were failed. 3 were induced mechanically, mechanical all were successful.

Conclusion: Induction of labor is a beneficial procedure for pregnant mothers. Although it has risks associated with it but it also decreases the rate of Caesarean-section deliveries and the risks associated with it. Mechanical methods used along with pharmacological methods have more success rate than only pharmacological methods used.

Keywords: Induction of labor, Methods of induction, Mode of delivery, Obstetric profile (parity).

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Introduction

Induction of labor is defined as "The process of artificially stimulating labor prior to its spontaneous onset ultimately achieving vaginal delivery."¹⁻² Induction is done when fetal and maternal risks outweighs the benefits of continuing the pregnancy. The high risk pregnancies are induced at preterm (<37 weeks) or early term (37- 38.6 weeks), whenever it is safe and possible. Inductions are done for both high risk and low risk pregnancies (39 weeks of gestation) because it reduces the caesarean section births in nulliparous women, decreases pregnancy induced hypertension in both multiparous and nulliparous women.³ the induction of

labor at or after term is associated with lesser perinatal deaths and caesarean sections as compared to the expectant management.⁴

Induction of labor is done for different indications i.e. hypertension in pregnancies, DM, PIH, decrease fetal movements, raised Doppler indices, PROM, Chorioamnitis, postdates, IUD, anomalous baby and for social reasons.⁵ Induction of labor is not recommended in uncomplicated pregnancies less than 41 weeks POG. WHO guidelines do not recommend induction for GDM and macrosomia.¹ Induction of labor should be

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discouraged until 38 weeks POG for benefits of mother and baby in case of low risk pregnancies.⁶

There are various methods of induction which are further categorized into pharmacological and mechanical methods. In pharmacological methods includes prostaglandin e1 (misoprostol), prostaglandin E2 (dinoprostone) and prostaglandin F2 alpha.⁷ The dinoprostone is used through different routes e.g. IV, extra amniotic, intracervical. According to nice guidelines other methods include IV oxytocin, hyaluronidases, estrogen, relaxin, mifepristone, corticosteroids and no donors.⁸ The non-pharmacological methods includes osmotic cervical dilators herbal supplements acupuncture intracervical balloon (ICC) homeopathy castor oil hot baths enemas and sexual intercourse. The initial techniques for ripening the cervix and inducing labor were mechanical. Pharmacological techniques have replaced them in recent years.⁹

There has been an increase in rates of induction worldwide and according to a recent reports, induction rates in UK is 34% and in USA, it is 23%.¹⁰ In Pakistan the overall induction rate according to study done in Agha Khan Hospital on total 328 nulliparous patients, 75% of the inductions were successful that is those patients delivered vaginally and 25% had to deliver baby through a caesarean section for different emergency indications.^{11,13,14,15}

Although induction of labor is a beneficial process but some risks are associated with induction of labor i.e. failed induction, fetal distress, intra uterine infections, uterine rupture, fetal demise and primary pph.^{12,16,17,18} It should always be done in morning hours. In our setup to identify the complications early and its prompt management.

Roughly 23 million caesarean sections were performed worldwide in 2012. At certain places caesarean section rate are more than standard limits. As a result, government and health services are promoting the vaginal deliveries.^{3,19}

The purpose of this study is to investigate and analyze the success rates of various methods of labor induction in connection to different modalities of delivery and outcomes, as well as to identify successful inductions in which patients advance into labor. This study's larger setting is the practice of inducing labor in pregnant women, which is a specialty of obstetrics and gynecology.

Methodology

This study was conducted on total 204 patients admitted in gynae C unit Ayub teaching Hospital, Abbottabad from Dec 2021 to Nov 2022 after taking ethical approval from hospital ethical committee. Patients were enrolled for study according to need for induction and then method of induction was decided according to parity ethical verbal consent for inclusion in study was taken from patient and written consent regarding induction as per unit protocol was also taken Upto para 5 were induced with pharmacological method (prostein E2) alone and combined pharmacological and mechanical, para 7-9 were induced with mechanical method only. Common indications were hypertensive disorders of pregnancy, intrauterine fetal death, PROM, chorioamnionitis, decrease fetal movements, postdates and social reasons (planned hospital delivery in patients belonging to far off areas). We used prostein E2 per vaginally as pharmacological methods, intra cervical catheter(ICC) as mechanical methods, and in combined method, both prostien E2 and ICC were used simultaneously. Prostein E2 3 mg pessry was used vaginally and was repeated after 6 hours when needed. In ICC, labor is initiated by stretching the cervix (neck of the womb), for this purpose folleys catheter of (22 fr) was used. Balloon of folleys was inflated with 80 cc fluid and local prostaglandins are released leading to initiation of labor. After admission in labor room patients were assessed for need of induction and method was decided according to parity of patient. In pharmacological method group patients were assessed for onset of uterine contractions, if no contractions for 6 hours then second dose of prostein was repeated. Mechanical method onset of uterine contractions and expulsion of folleys was observed. All patients enrolled were monitored for feotal wellbeing with 20 minutes CTG and then intermintent feotal heart auscultation continued till delivery. Details were noted on structured Performa including Patients age, parity, gestational age, indications for induction, method of induction and outcomes. Data was analyzed through SPSS version 16.

Results

Table I presents the descriptive statistics of the demographic characteristics of the study participants. In this study the mean age of the patients was 28 ± 5.711 with minimum and maximum age being as 18 - 46 years. (Table I)

Table I: Descriptive statistics of Demographics.

	Min	Max	Mean±SD
Ages of participants (years)	18	46	28.00±5.71
Gravida	1	12	3.39±2.42
Parity	0	9	1.98±2.12
Miscarriage	0	5	.42±.88
Alive	0	9	1.75±1.98
Period of gestation(weeks)	28.2	42.5	38.62±2.70
Bishop score	0	6	3.21±1.20
Induction to contraction interval(hours)	.00	11.00	5.30±2.64
Labour to delivery interval(hours)	.00	12.00	3.76±2.68

Table II provides descriptive statistics of the gestation periods among the study participants, presented in terms of both frequency and percentage. In our study out of 204 patients induced, 36 patients were preterm, 125 patients at term and 43 patients were late term and postdates

Table II: Descriptive statistics of gestation period.

	Frequency	Percentage
28.2 to 36.6 weeks	36	17.6
37 to 40.6 weeks	125	61.3
41 to 42.6 weeks	43	21.1
Total	204	100.0

In this study out of 204 patients induced 106 inductions were done with pharmacological (Dinoprostone), among which 48% were successful and 3.9% were failed. 54 inductions were done with both pharmacological plus mechanical methods, among which 42.6% were successful and 3.9% were failed. 3 were induced with mechanical all were successful. (Table III)

In 188 successful inductions, 166 patients delivered vaginally and 22 patients delivered through caesarean

sections due to fetal distress, and 18 failed inductions were delivered through caesarean section. (Table IV)

Discussion

Approximately 20% of deliveries are preceded by labor induction, a percentage that hasn't changed significantly in recent years. Fetal mortality was the only indication for labor induction centuries ago, but it is now a very rare indication, with protracted pregnancy and maternal hypertensive problems being the leading indications for the previous 50-60 years.

Techniques for inducing labour have also changed from dietary delicacies and verbal threats giving way to physical stimulation mainly achieved by cervical stretching and amniotomy and more recently to sophisticated pharmacological manipulation using oxytocin and prostaglandins, based on our expanding knowledge of the physiological processes involved in spontaneous parturition. Relaxin, antiprogestins, nitric oxide as well as complementary medicines have also been explored in recent years. However, successful induction is still not assured, and over the past ten years, there has been a growing focus on researching methods for calculating the likelihood of success. Measurement of foetal fibronectin in cervical mucus, maternal serum nitrite/nitrate concentrations, ultrasound delineation of cervical form and electrical impedance measurements across the cervix are all being investigated. The main goals remain patient fulfillment, success, and safety; nevertheless, economic evaluations are now playing a considerable role in the search for the best induction technique.²⁰

Approximately 20% of all deliveries involve labour induction, a ratio that has remained relatively stable. In the past, fetal death was the primary reason for induction, but this has become rare. Prolonged

Table III: Comparison of Outcome of induction.

		Method of induction			Total	P-Value
		Pharmacological	Mechanical	Both		
Outcome of induction	Successful	98(48.0%)	3(1.5%)	87(42.6%)	188 (92.2%)	0.856
	Failed	8 (3.9%)	0	8 (3.9%)		
Total		106 (52.0%)	3(1.5%)	95 (46.6%)	204(100.0%)	

Table IV: Comparison of Outcome of induction and mode of delivery.

		Mode of delivery		Total	P-Value
		C- Section	NVD		
Outcome of induction	Successful	22 (10.8%)	166 (81.4%)	188 (92.2%)	< 0.001
	Failed	16 (7.8%)	0		
Total		38(18.6%)	166(81.4%)	204(100.0%)	

pregnancy and maternal hypertensive disorders have been the major reasons for the past 50–60 years. Induction techniques have evolved from historical dietary and verbal methods to physical methods like cervical stretching and amniotomy. Recent approaches involve advanced pharmacological manipulation using oxytocin, prostaglandins, and other agents based on our improved understanding of natural childbirth processes. Additional explorations include relaxin, antiprogesterins, nitric oxide, and complementary medicines. Despite these advances, successful induction remains uncertain. Efforts are now focused on predicting success with investigations into fetal fibronectin, nitrite/nitrate concentrations, cervical ultrasound, and electrical impedance measurements. The primary goals remain safety, success, and patient satisfaction, with economic considerations also gaining importance in finding the optimal induction method.²⁰

The study was designed to observe the success of different methods of induction with different modes of deliveries and outcomes. Successful inductions in our study were those in which patients went into labor. The mean age of the patients was 28 ± 5.711 with the minimum and maximum age being as 18 - 46 years.

From the total of 204 patients induced, 36 were preterm, 125 were term, and 43 were late term and postdates. In a previous study 81 (27.6%) patients were having preterm gestational age, 161 (54.9%) were at term and 51 (17.7%) were at post-term.²⁰

In this study, out of 204 patients induced 106 inductions were done with pharmacological (Dinoprostone), of which 48% were successful and 3.9% were failed. 54 inductions were done with both pharmacological plus mechanical methods, among which 42.6% were successful and 3.9% were failed.³ were induced with mechanical all were successful. A previous study showed that 60 (20%) induction was failed while 233 (80%) induction was found successful.²⁰ This finding is comparable with the study done in Jimma University specialized hospital, 21.4%.²¹

In 188 successful inductions, 166 patients were delivered vaginally, 22 patients were delivered through caesarean sections due to fetal distress, and 18 failed inductions were delivered through caesarean section. The results of a previous study showed that 175 (59.7%) patients were delivered vaginally, and 115 (39.3%) were delivered through a C section.²⁰

Conclusion

Induction of labor is a beneficial procedure for pregnant mothers. Although it has risks associated with it but it also decreases the rate of C-section deliveries and risks associated with it. Mechanical methods used along with pharmacological methods has more success rate than only pharmacological methods use. Different management policies for failed induction like delaying the induction, elective C-section or additional ways of induction like use of oxytocin. Different variables affecting the success of induction of labor.

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