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Induction of Labour among Patients Admitted for Delivery in the Department of Obstetrics and Gynaecology of a Tertiary Care Centre: A Descriptive Cross-sectional Study

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ABSTRACT

Introduction: Induction of labour is the initiation of uterine contraction in pregnant women at term with the aim of achieving a normal vaginal delivery when the benefits of doing so outweigh the risks of waiting for spontaneous labour. The most common indication for induction of labour is prolonged or post-term pregnancy. The aim of this study was to find out the prevalence of induction of labour among patients admitted for delivery in the Department of Obstetrics and Gynaecology of a tertiary care centre.

Methods: A descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology of a tertiary care centre from 1 January 2025 to 1 April 2025 after obtaining the ethical approval from the Institutional Review Committee. All the pregnant women at term admitted for delivery were enrolled. Demographic and clinical data was collected in the obstetrics ward using a standardized questionnaire. Convenience sampling method was used. Data was entered and analyzed using IBM SPSS statistics version 25. Point estimate and 95% Confidence Interval were calculated.

Results: Among 319 patients admitted for delivery, induction of labour was done in 97 (30.41%) (25.36-35.46, 95% Confidence Interval).

Conclusions: The prevalence of induction of labour was found to be similar to other studies done in similar settings.

Keywords: *caesarean section; induction of labor; Mifepristone; Misoprostol; Syntocinon.*

INTRODUCTION

Induction of labour (IOL) is the most common obstetric intervention performed worldwide with minimal complications to aid vaginal delivery. It is a method by which there is initiation of uterine contraction using medical, surgical or combined methods. Induction of labour is done when the risks of continuing the pregnancy outweighs the risks of termination of pregnancy. It is carried out in over 20% of pregnancies on an average.[1] The rate of labor induction has grown significantly over the years, nearly doubling between 1990 and 2006 and continuing to increase worldwide.[2] Over the past 20 years, studies have shown a high increase in the rate of induced labor from 9.5% in 1990 to 21% in 2004.[3] Some of the indications for induction of labour are elective, post dated pregnancy, premature rupture of membrane, pregnancy associated with medical illness like Diabetes, HTN and hypothyroidism.[4]

Prolonged pregnancy is known to be associated with significantly increased risks of perinatal and maternal complications.[5] Effective and safe methods for IOL are vital to optimizing maternal and neonatal outcomes, particularly in tertiary care settings where high-risk pregnancies are managed.[6]

The aim of this study was to find out the prevalence of induction of labour among patients admitted for delivery in the Department of Obstetrics and Gynaecology of a tertiary care centre using Misoprostol, Mifepristone and Syntocinon.

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METHODS

This descriptive cross-sectional study was conducted in the Department of Obstetrics and Gynaecology of Kathmandu Medical College Teaching Hospital (KMCTH) from 1 January 2025 to 1 April 2025 after obtaining the ethical approval from the Institutional Review Committee (Reference number: 25122024/03). All the pregnant women at term admitted at KMCTH for delivery were included in the study. Pregnant women with multiple pregnancy, cephalopelvic disproportion, preterm labour, preterm premature rupture of the membranes (PPROM), malpresentation, APH, any scars in the uterus, any uterine and cervical anomalies, severe oligohydramnios requiring immediate delivery and history of hypersensitivity to the inducing agents were excluded from the study. All the patients enrolled in the study were explained about the study and an informed consent was taken. Convenience sampling method was used. The sample size was calculated using the following formula:

$n = Z^2 \times p \times q / e^2$

$= 1.96^2 \times 0.50 \times 0.50 / 0.06^2$

$= 267$

Where,

n= minimum required sample size

Z= 1.96 at 95% Confidence Interval (CI)

p= prevalence taken as 50% for maximum sample size calculation

q= 1-p

e= margin of error, 6%

The sample size calculated was 267. However the final sample size taken was 319.

Demographic and clinical data was collected in the obstetrics ward using a standardized questionnaire. A questionnaire which included the demographic profile, general history, past and present obstetrics history, history of past illness, family history, drug history was used. A detailed obstetric examination was performed followed by pelvic assessment. The period of gestation, indication of labour induction, fetal wellbeing was confirmed and all the contraindications of vaginal delivery were ruled out before induction of labour.

The most commonly used drugs for effective and safe induction of labour are Mifepristone, Misoprostol and Oxytocin. Mifepristone, also known as RU-486 is an antiprogestogen that works by blocking the effects of progesterone thereby making the cervix soft and causing uterine contraction.[5] Misoprostol is a synthetic analogue of prostaglandin E1 that acts on the cervix and uterine smooth muscle, facilitating dilatation and promoting uterine contractions. Misoprostol can be given through various routes such as oral, buccally, sublingually, per vaginal, per rectal.[7] The usual dose is 50 mcg orally or 25 mcg vaginally, which may be repeated every 4 hours if contractions are absent or not painful.[8] Oxytocin is a neuropeptide produced in the hypothalamus and released by the posterior pituitary gland.[9]

The patient enrolled was given tab Mifepristone 200 mg per oral on day 1 of induction. If there was no onset of labour within 24 hours, Misoprostol 200 mcg was dissolved in 200 ml of water and 25 ml i.e 25 micrograms of this solution was given per oral 2 hourly for a maximum of 4 doses depending on the contractions. If labour was not induced, then on the third day, injection Oxytocin 2.5 IU in the first 1 pint of ringer's lactate followed by 5 IU in another pint of ringer's lactate was administered in infusion in titrating dose to a maximum dose of 2 pint. If there's still no onset of labour; then they were planned for a caesarean section for failed induction. Once in labour pervaginal examination was done 4 hourly or SOS, contraction and FHS was monitored half hourly and vitals 2 hourly.[5,10,11] Those patients who were not in labour were started with tab Mifepristone and escalated as mentioned above and those who went into labour with only tab Mifepristone were not given Misoprostol but given Syntocinon if required while some delivered even without Syntocinon. Those patients who were in early labour were started with tab Misoprostol directly and if required Syntocinon was added.

Data was entered and analysed using IBM SPSS statistics version 25. Point estimate and 95% confidence interval was calculated.

RESULTS

Among 319 patients admitted for delivery, induction of labour was done in 97 (30.41%), (25.36-35.46, 95% Confidence Interval). Among 97 patients undergoing induction of labour, the majority of them were in the age group of 26-30 years, 39 (40.20%). Induction was successful and normal delivery was observed in 61 (62.89%) patients (Table 1).

Table 1. Characteristics of patients undergoing induction of labour (n= 97).

Age (in years)	n (%)
19-25	28 (28.87)
26-30	39 (40.21)
31-35	26 (26.80)
Above 35	4 (4.12)

Mode of delivery	
Normal delivery	61 (62.89)
Caesarean section	35 (36.08)
Vacuum assisted delivery	1 (1.03)
Induction to delivery time (in hours)	
<12	13 (13.40)
12-24	35 (36.08)
25-36	20 (20.62)
>36	29 (29.90)

Majority of the patients undergoing induction of labour were primigravida, 52 (53.61%) (Figure 1).

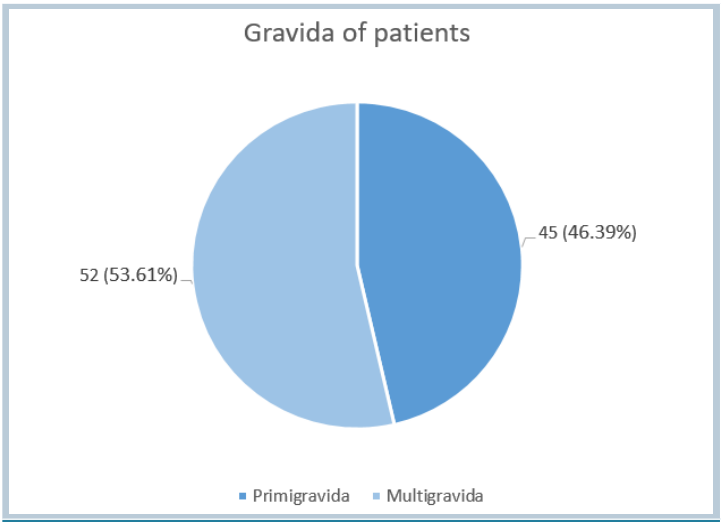

Figure 1. Gravida of patients undergoing induction of labour (n= 97).

Among 97 patients undergoing induction of labour, 44 (45.36%) of them received all three medications i.e tab Mifepristone, tab Misoprostol and Syntocinon infusion. The majority of them, 28 (28.87%) had normal delivery whereas 15 (15.46%) patients underwent cesarean section with the most common indication for caesarean section being failed induction of labour in 13 (13.40%). Similarly, 39 (40.21%) required only tab Mifepristone and tab Misoprostol among which 27 (27.84%) had normal delivery and 12 (12.37%) underwent cesarean section among which majority were due to meconium-stained liquor, 4 (4.12%). Among them, 12 (12.37%) went into labour after tab Mifepristone only, among which 9 (9.28%) required augmentation with Syntocinon as well. Out of 12 patients who delivered with Mifepristone only, 5 (41.67%) had normal delivery while 7 (58.33%) had cesarean section.

Two (2.06%) patients who were in early labour were started with Misoprostol, among which 1 (1.03%) delivered without augmentation with Syntocinon. Among these two, 1 (1.03%) was normal delivery and 1 (1.03%) was delivered via cesaerean section.

Among 97 patients, the majority of them, 95 (97.94%) required preinduction with Mifepristone (Table 2).

Table 2. Use of inducing agents among patients who were induced for labour (n= 97).

Inducing agent	**n (%)**
Mifepristone	95 (97.94)
Misoprostol	
1 Dose	10 (10.31)
More than 1 dose	75 (77.32)
Syntocinon	54 (55.67)

Among 97 patients who were induced, 35 (36.08%) patients underwent caesarean section. Majority of them, 18 (18.56%) were due to failed induction. However, 1 (1.03%) who had cord prolapse also had meconium-stained liquor (Table 3).

Table 3. Indication for Caesarean section among patients undergoing induction (n= 97).

Indications	**n (%)**
Failed induction	18 (18.56)
Non-reassuring NST	4 (4.12)
Meconium-stained liquor	7 (7.22)
Cesarean Delivery on Maternal Request	1 (1.03)
Fetal Bradycardia	3 (3.09)
Cephalopelvic disproportion	2 (2.06)
Cord prolapse	1 (1.03)

Among 97 patients undergoing induction, the majority of the neonates born were female, 49 (50.52%). Most of them, 45 (46.39%) had a birth weight between 3.1-3.5 kg. Majority of them, 14 (14.43%) were admitted to special baby care unit (SBCU) because of meconium-stained liquor (Table 4).

Table 4. Characteristics of neonates born to patients undergoing induction of labour (n= 97).

Variables	**n (%)**
Weight (in kg)	
<2.5	8 (8.25)
2.5-3	42 (43.30)
3.1-3.5	45 (46.39)
>3.5	2 (2.06)

Indication for admission to SBCU	
Grunting	4 (4.12)
Poor cry	1 (1.03)
Meconium-stained liquor	14 (14.43)
For observation	**11 (11.34)**
Low birth weight	2 (2.06)
Gender	
Male	48 (49.48)
Female	49 (50.52)

DISCUSSION

In this study, the prevalence of induction of labour was found to be 97 (30.41%). This study demonstrated that the majority of them, 52 (53.61%) were primigravida whereas, 45 (46.39%) were multigravida. In a similar study done in Nepal, the prevalence was found to be 18.43% which is similar to our study.[12] Similarly, 63 (53.39%) were primigravida which was similar to our study.[12] In our study, the majority of patients, 39 (40.20%) were in the age group of 26-30 years whereas 28 (28.87)% patients were in between age groups of 19-25 years. In another study done in Nepal, majority of the labour induced women, 52.4% were in the age group of 20-24 years which is much higher than found in our study, and primigravida were 47.8% and multigravida 49.9% showing greater prevalence of multigravida in contrast to our study with higher prevalence of primigravida.[13]

Out of 97 patients, 95 (97.94%) of them received Mifepristone, 10 (10.31%) of them received single dose of Misoprostol and 75 (77.32%) of them received more than 1 dose of Misoprostol and 54 (55.67%) patients required Syntocinon. A clinical trial shows that oral Misoprostol reduces the need of Oxytocin and shortens the the time between induction and delivery when compared to placebo.[14]

Oral Misoprostol is effective for achieving vaginal deliveries.[15] A study revealed that Misoprostol is an effective agent for labour induction when administered by both route orally or vaginally but occurrence of abnormalities on fetal heart rate was more frequently observed in vaginal application.[16] However, only oral Misoprostol solution was used in our study. In this study the majority of them, 35 (36.08%) had an induction to delivery time of 12-24 hours and only 13 (13.40%) of them delivered within 12 hours of initiation of induction of labour.

Among 97 patients undergoing induction of labour, 44 (45.36%) of them received all three medications i.e tab Mifepristone, tab Misoprostol and Syntocinon infusion. The majority of them 28 (28.87%) had normal delivery whereas 15 (15.46%) underwent cesarean section and 1 (1.03%) had vacuum delivery. Similarly, 39 (40.21%) required only tab Mifepristone and tab Misoprostol among which 27 (27.84%) had normal delivery. In our study, 12 (12.37%) went into labour after tab Mifepristone only which was lower compared to 32% in another similar study. Among them 69% had vaginal delivery which was higher compared to our study where 41.67% had vaginal delivery. Similarly, 83 (85.57%) required Misoprostol as well which was higher compared to that study where 68% required Misoprostol.[17]

In this study, 32 (32.99%) neonates were admitted in SBCU, with the majority of them, 14 (14.43%) admitted for meconium-stained liquor. In a similar study done in Nepal, 17 (14.40%) had meconium-stained liquor which was very close to the findings of our study.[12] In similar study done in India, 6 (8%) were admitted for meconium stain liquor which was lower than in our study.[18] Majority of the neonates, 45 (46.39%) had birth weight between 3.1-3.5 kg, whereas 8 (8.25) had birth weight less than 2.5 kg. In similar study done in Nepal, a total of 5 (4.24%) babies had birth weights less than 2500 grams which was similar to our study.[12]

The combination of Mifepristone, Misoprostol, and Syntocinon was effective in increasing vaginal delivery in our setting. A larger-scale study is recommended for more comprehensive results. Safe and effective implementation of labour induction can improve maternal and neonatal health outcomes, potentially helping to reduce disparities in maternal and perinatal health.[1]

Since this study is single institution-based and a descriptive cross- sectional study with a small sample size, the results cannot be generalised to a wider population. A study design with a higher level of evidence is recommended for future studies.

CONCLUSIONS

The prevalence of induction of labour was found to be similar to other studies done in similar settings. Combination of inducing agents tab Mifepristone, tab Misoprostol and injection Syntocinon for induction of labour increases the chance of vaginal delivery. Though induction to delivery time is found to be slightly increased in our study, a larger scale study is required to establish the results.

Conflict of Interest: None

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