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Choosing The Right Method For Labour Induction: Misoprostol Alone Versus Misoprostol With Foleys Catheter

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Abstract
Background
The aim of the retrospective study is to compare effectiveness, safety of oral misoprostol and Foley's catheter for labour induction with misoprostol. The efficacy is measured by induction to delivery interval, the total number of normal vaginal spontaneous delivery within 24 hours without any complications. The two methods of induction were compared. As there is no ideal method of induction of labour, several methods and a combination method with Foley's catheter and misoprostol was used to find the advantage of both methods.
Materials and Methods: *This retrospective study was conducted among the 400 patients of which 200 patients who had oral misoprostol alone and the rest 200 patients who had Foley's catheter with misoprostol over the period of four months from 2024 May to August. Inclusion criteria consisted of singleton pregnancy greater than or equal to 37 weeks with intact membrane, cephalic presentation,bishops score less than or equal to 4. The exclusion criteria comprised of previous LSCS or uterine surgery, rupture of membrane.*
Results: *The results were analyzed. The comparison of the maternal effects and also the neonatal outcome were studied in each group. We came to a conclusion that oral misoprfostol alone with Foley's catheter is a better method for labour induction.*
Conclusion*: The synergetic action of Foley's catheter and misoprostol is remarkable. It is economical and preferable in developing countries.*
Keywords: *Misoprostol, Foley's catheter with misoprostol, induction of labour, delivery outcomes*

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I. Introduction

Definition of induction of labour is inducing labour by mechanical or pharmacological drugs after the fetal viability before the onset of spontaneous labour. The incidence is 20 to 30%[1].

The process of cervical ripening means effacement and dilatation of cervix are mandatory for induction uterine contraction. Foley's catheter and prostaglandins are essential for induction. The outcome is measured by the safety and effectiveness to achieve a normal vaginal delivery within 24 hours without any adverse effects like maternal morbidity due to infection, uterine hyper stimulation. The neonate should be without respiratory distress, seizure, meconium aspiration resulting in admission in neonatal intensive care unit. The non-reassuring foetal heart monitoring resulting in caesarean section and instrumental delivery are defined as failed induction.
Induction with Foley's catheter and misoprostol oral tablets were used.

Misoprostol E-1 (prostaglandin) dose in term induction is 25 mcg orally every 2 hours it can be used by vaginally also to dosage 50 mcg every 4th hourly.

With oral misoprostol the peak is reached within 30 minutes unlike vaginal tablets the longer the duration of action about 4 hours. The other method of induction of labour is Foley's. The Foley's catheter with 30 ml balloon is easy to insert. It is a mechanical method and safer that can be used in previous caesarean cases also. It does not increase rate of infection or cervical incompetence. The method of inducing labour with a balloon catheter or misoprostol does not significantly differ in outcome. Labour induction by balloon catheter decreases hyper-stimulation of uterus with foetal heart changes by 65%. In addition, it reduces the risk of neonatal morbidity by 52%[2]. Self-administration of oral misoprostol 25 microgram every 2 hourly can be used by women avoiding admission and repeated vaginal examination[3]. A substantial randomized study in India evaluated the effectiveness of oral misoprostol 25 mcg every 2 hours against Foley's Catheter with both methods followed by artificial rupture of membrane and oxytocin administration. The results were found that these methods lead to reduction in Caesarean deliveries, proved to be more economical and preferred by patients[4]. The combination of oral misoprostol with transcervical Foley's catheter insertion reduces the induction delivery interval and increases the number of vaginal deliveries[5].

II. Materials And Methods

Retrospective study was conducted by analysing the case records from Medical record department Karuna Medical College after obtaining approval of the institutional scientific and ethical committee . This study was conducted over the period of four months from 2024 May to August among the 400 patients of which 200 patients who had oral misoprostol alone and the rest 200 patients who had Foley's catheter with misoprostol.

Study Design: Retrospective Study.

Inclusion criteria:

Inclusion criteria consisted of singleton pregnancy greater than or equal to 37 weeks with intact membrane, cephalic presentation, bishops score less than or equal to 4.

Exclusion criteria: The exclusion criteria comprised of previous LSCS , uterine surgery, rupture of membrane,malpresentation,cases where in misoprostol is contraindicated and placenta previa.

Procedure methodology: The data including age, parity, gestational age,obstetric history, menstrual history, bishops score and indication for induction were noted. USG to confirm gestational age, fetal presentation, fetal heart rate recording was done.Oral misoprostol 25 mcg every 2 hours for maximum of 8 doses was considered . If the patients had not developed uterine contraction infusion of Oxytocin 1 to 2 mIU in 30 minutes, interval was used for augmentation. Results were recorded every 4th hourly.In case of Foley's with 30 ml balloon inserted, the progress of labour noted every 4 hours, expulsion was checked and recorded, need for oxytocin was noted, In both the cases active labour interval, the induction to delivery time and APGAR score noted.

Statistical analysis: Variables were shown in numbers noted, the percentages between the two groups, the qualitative variables compared by using chi square.P value less than 0.05 was considered as significan

III. Results

The Results were recorded every 4th Hourly ,the induction to delivery time ,the time duration and the stages of labour,APGAR score were noted .The mean dose of misoprostol which was used in group A amounting to 4.66 with 3 to 8 doses but in case of Group B whereas misoprostol with Foleys catheter 4 to 8 doses ,the mean dose was 5.99.The difference was not remarkable .The use of oxytocin in Group A was 30% in Group B 18%,the difference is not significant(p-0.065).The maternal side effects like fever was noted in 30% in Group A in Group B it was 10%(p-0.017)it was significant.Vomiting was found in 25% inGroup A whereas in Group B 7.5%(p-0.100)which was significant.In Group A hyperstimulation of the uterus was noted in 20%,in Group B it was only 5%(p-0.017)which was again significant.The rate of PPH in Group a was 25% while it was 5% in Group B(p-0.004) which was significant.In our study there was no case of chorioamninitis in either group.The rate of vaginal delivery in Group A was 65% and in Group B it was 95%(p-0.003)which is again significant.The rate of Caesarean section was higher due to abnormalities noted in foetal heart recording .It was 25% in Group A where as in Group B it was 2.5%(p-<0.05)it was again significant.The instrumental delivery in Group A was 10% and Group B it was 2.5%(p -0.011)which was again significant.Regarding neonatal complications ,neonatal resuscitation was required in 70% in Group A and 15% in Group B(p-<0.05)which is significant.CTG abnormalities where associated in 35% in Group A and it was 12.5% in Group B(p-<0.05)which is significant.NICU and MSL values also showed significance.

Table 1. Demographic Variables

VARIABLE	CATEGORY WISE	GROUP WISE				TOTAL		CHI-SQUARE	P-VALUE
		Misoprost(200)		Foleys +misoprost(200)					
		N	%	N	%	N	%		
AGE	<20 yrs	52	26	51	25.5	103	25.75	7.825	0.095
	20-25 yrs	64	32	70	35	134	33.5		
	26-30 yrs	53	26.5	51	25.5	104	26		
	31-35yrs	31	15.5	28	14	59	14.75		
	>36yrs	46	23	58	29	104	26		
PARITY	Primi	114	57	118	59	232	58	0.574	0.75
	Second	44	22	46	23	90	22.5		
	Multi	42	21	36	18	78	19.5		
BMI	<20	36	18	31	15.5	67	16.75	0.727	727
	20-25	144	72	152	76	296	74		
	25-30	12	6	12	6	24	6		
	>30	8	4	5	2.5	13	3.25		

Mean gestational age	39.2 weeks	39.4 weeks	
Bishops score	8.2	7.6	

Table 2. Indications for induction

CATEGORY	GROUP WISE: MISOPROST(200) N	%	FOLEYS + MISOPROST(200) N	%	TOTAL (400) N	%	CHI-SQUARE	P-VALUE
GDM	52	26	28	14	80	20	7.2	0.207
PIH/Preeclampsia	40	20	20	10	60	15	6.66	0.248
Post term pregnancy	84	42	72	36	156	39	0.92	0.968
FGR	12	6	24	12	36	9	4	0.548
Oligohydramnios	10	5	12	6	22	5.5	0.18	0.999
Rh Negative	2	1	4	2	6	1.5	0.67	0.999

Table 3. Mode of Delivery

CATEGORY	GROUP WISE: Group A Misoprost(200) N	%	Group B Foleys+ Misoprost(200) N	%	TOTAL N	%	CHI-SQUARE	P-VALUE
Vaginal delivery	130	65	190	95	320	80	11.25	0.003
Instrumental delivery	20	10	5	2.5	25	6.25	9	0.011
Cesearean section	50	25	5	2.5	55	13.75	36.8	<0.05

Table 4. Progression of labour in vaginal delivery

CATEGORY	GROUP WISE: Group A Misoprost(200) Mean hours	Group B Foleys+ Misoprost(200) Mean hours
Latent phase	9.8	8.6
Active phase to delivery interval	3.04	3

Table 5. Indication for caesarean section

CATEGORY	GROUP WISE: Group A Misoprost(200) N	%	Group B Foleys+ Misoprost(200) N	%	TOTAL N	%	CHI-SQUARE	P-VALUE
No progress in 1st stage	40	20	30	15	70	17.5	1.43	0.835
No progress in 2nd stage	13	6.5	10	5.0	23	5.75	0.26	0.994
Fetal distress	73	36.5	70	35.0	143	35.75	0.06	1.000
MSL	73	36.5	50	25.0	123	30.75	3.46	0.485
Cord prolapse	0	0.0	0	0.0	0	0	Undefined	n/a

Table 6. Perinatal Outcomes

CATEGORY	GROUP WISE: Group A Misoprost(200) N	%	Group B Foleys+ Misoprost(200) N	%	TOTAL N	%	CHI-SQUARE	P-VALUE
Neonatal resuscitation needed	60	30	30	15	90	22.5	10.00	<0.05
CTG abnormalities	70	35	25	12.5	95	23.75	13.73	<0.05
NICU admission	80	40	20	10	100	25.0	36.00	<0.05
MSL	50	25	15	7.5	65	16.25	16.92	<0.05

Table 7. Maternal Side Effects

CATEGORY	GROUP WISE				TOTAL(400)		CHI-SQUARE	P-VALUE
	Group A Misoprost(200)		Group B Foleys+ Misoprost(200)					
	N	%	N	%	N	%		
FEVER	60	30	20	10	80	20.0	10.00	0.017
VOMITING	50	25.0	15	7.5	65	16.25	6.25	0.100
HYPERSTIMULATION	40	20.0	10	5.0	50	12.5	10.00	0.017
POSTPARTUM HAEMORRHAGE	50	25.0	10	5.0	60	15.0	13.33	0.004

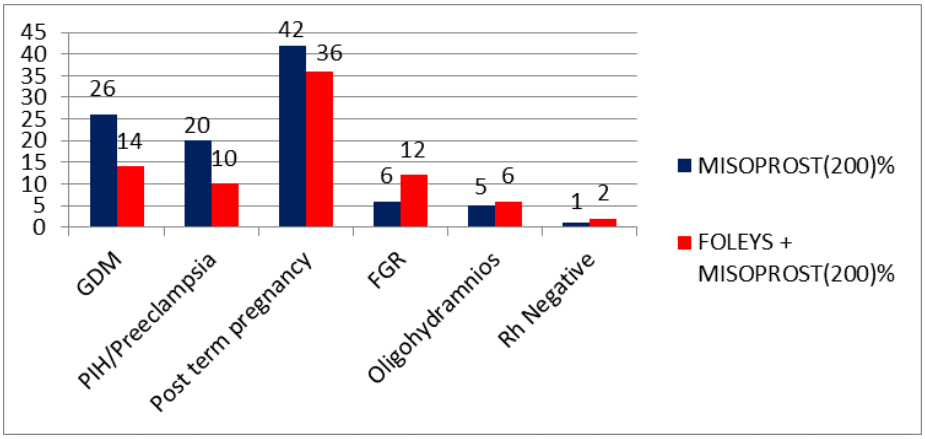

Figure 1. Indications For Indication

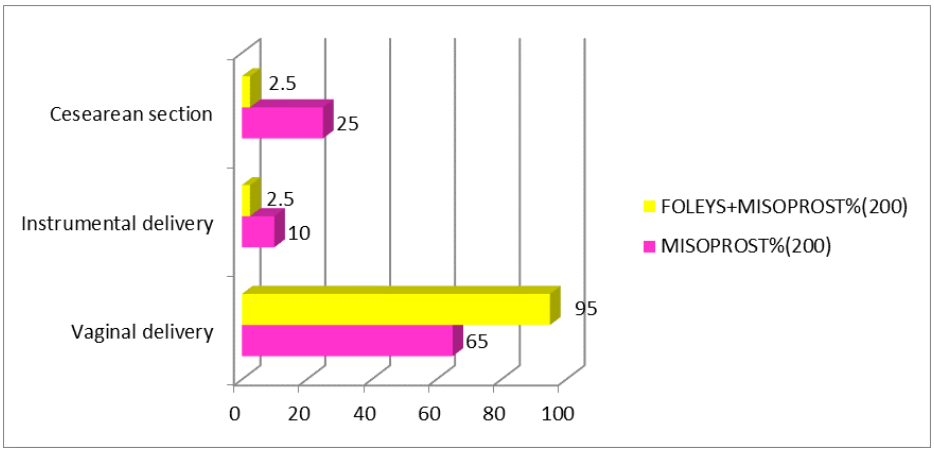

Figure 2. Mode Of Delivery

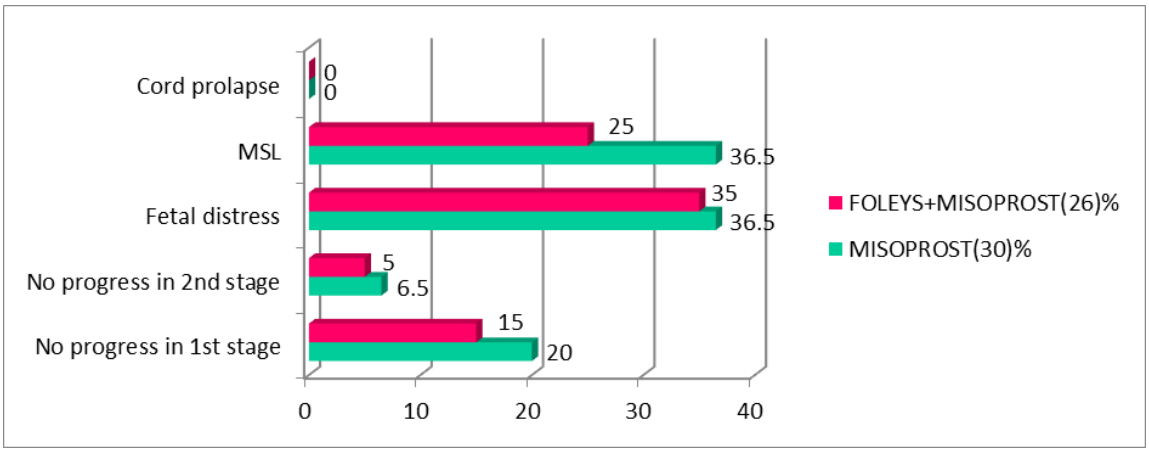

Figure 3. Indication For Caesarean Section

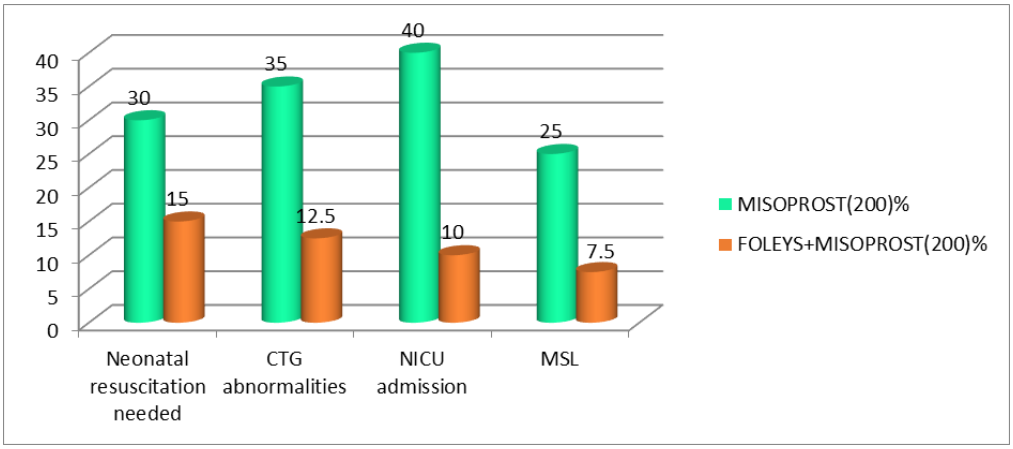

Figure 4. Perinatal Outcomes

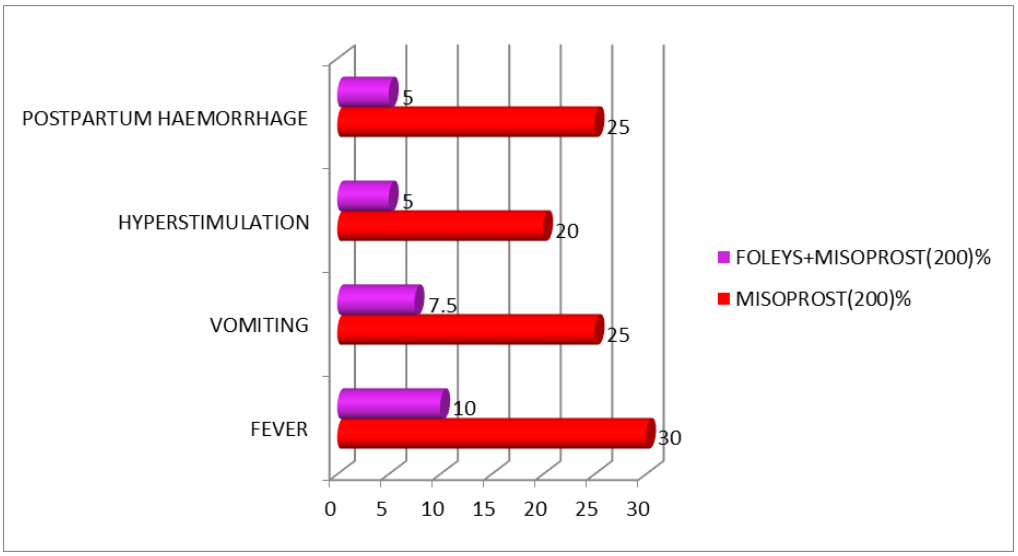

Figure 5. Maternal Side Effect

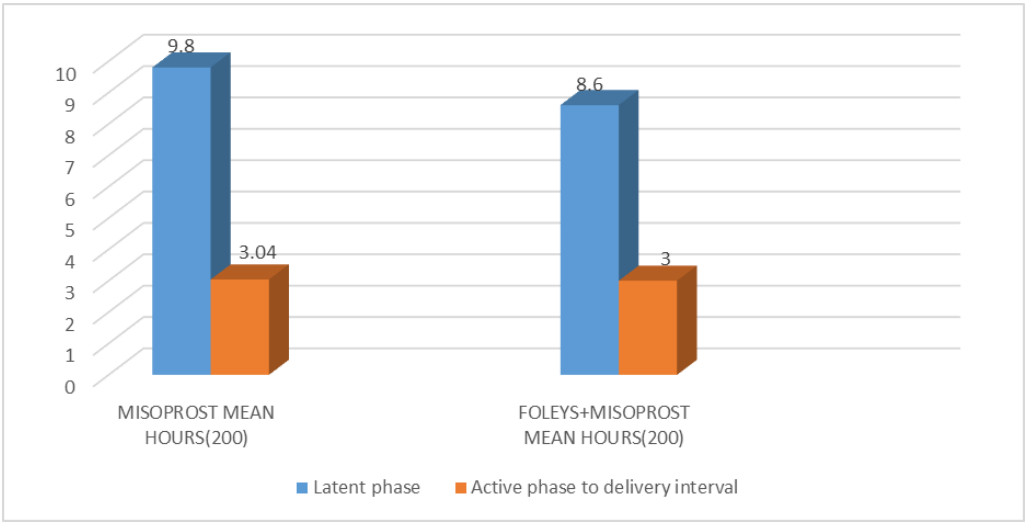

Figure 6. Progression Of Labour In Vaginal Delivery

IV. Discussion

This research indicates that combining Foley's catheter with oral misoprostol resulted in more vaginal births and reduced caesarean risk compared to misoprostol alone. This combination proved advantageous even for less favourable cervix due to the added effect of mechanical induction. The caesarean section rate was 22.5%

for patients receiving only oral misoprostol, which was higher than the rate for those treated with Foley's catheter followed by misoprostol 8%. These results are similar to other study(6). Therefore, patients desiring vaginal delivery may benefit from choosing Foley's catheter followed by misoprostol for labour induction.

Misoprostol is known to cause side effects such as tachysystole , hyperthermia, meconium-stained amniotic fluid, nausea, and vomiting (7). In our study, the incidence of meconium-stained liquor(MSL) was higher in the misoprostol-only group, likely due to the increased number of doses administered. Unlike prostaglandin E1 alone, Foley's catheter was not associated with hyper stimulation or non-reassuring foetal heart monitoring. Despite the increased risk of foetal hypoxia in post-term pregnancies, foetal growth restriction, and preeclampsia, Group B did not show higher rates of acidosis. This contradicts findings from other researchers who reported more NICU admissions with Foley's catheter alone, possibly due to a prolonged latent phase (8).Foley's catheter use, is typically linked to maternal hyperpyrexia from vaginal manipulation (9), Group B in this study experienced less fever. Unlike one study , No difference in complications were observed(10).The combination of Foley's catheter and misoprostol induction showed the lowest incidence of uterine hyperstimulation with foetal heart changes,specially in hypertensive patients the outcome is better (11), which was also confirmed in our study. So Group B demonstrated better perinatal outcomes compared to Group A,the misoprostol-only group. One study found that induction-to-delivery time was shorter with Foley's catheter plus misoprostol . This study similarly showed that the combined approach resulted in a reduced induction-to-delivery interval. Even for nulliparous women, induction with Foley's catheter appears to decrease the time from induction to delivery (12)

Synergetic effect of Foley’s catheter and misoprostol had a significant lower incidence of Caesarean section and also the induction delivery interval was shorter , helping the patient and obstetrician for a shorter stay in labour room.(13)In one study double ballon foleys catheter has been used(14)

V. Conculsion

This study aims to compare the efficacy and outcome with misoprostol and Foley’s catheter with misoprostol for induction of labour in 400 women. The results indicate several significant findings influence clinical practice. The demographic variables are not significant for IOL.There was a higher percentage of vaginal delivery in combination group. The misoprostol group was found to have higher neonatal resuscitation , CTG abnormalities, Meconium stained liquor and NICU admission . Misoprostol group showed significantly higher rate of maternal side effects including fever, vomiting, hyperstimulation and PPH.The result suggests as far as the IOL is concerned both methods are effective. The final outcome as far as the neonatal and maternal complications are concerned the combination method is preferable and suitable. It is more economical in low resources countries. Above all it is the choice of the women who prefer vaginal delivery , it is mandatory to provide full descriptions of methods and outcome to the patient.

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