INDUCTION OF LABOUR WITH VAGINAL MISOPROSTOL AND INCIDENCE OF MECONIUM STAINED LIQUOR AND FETAL OUTCOME

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ABSTRACT

AIM
Induction of labour with low dose of misoprostol and detecting the incidence of meconium stained liquor and foetal outcome.

DESIGN
Prospective randomized control trail conducted at Niloufer Maternity and Children Hospital from January 2013 to September 2014.

PARTICIPANTS
150 pregnant women requiring induction of labour.

METHODS
The women were divided into 2 groups based on BISHOP score as favorable and unfavorable cervix group. Induction delivery interval, number of misoprostol doses, incidence of meconium stained liquor, NICU admission and APGAR score.

RESULTS
Among the outcomes compared between unfavorable and favorable cervix groups induction delivery interval, number of misoprostol doses and incidence of meconium stained liquor was more in unfavorable cervix group and 'p' value was statistically significant. Long induction delivery interval and higher number of misoprostol doses were associated with higher incidence of meconium stained liquor in primi gravida with unfavorable cervix group.

CONCLUSION
Misoprostol is an effective priming and labour inducing agent, which fulfils all the criteria of an ideal inducing agent. Though incidence of meconium stained liquor is higher in misoprostol induced labour among women with unfavorable cervix, the foetal outcome seems to be very good.

KEYWORDS
Post term pregnancy induction of labour, Misoprostol, Foetal distress.

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INTRODUCTION: Induction of labour constitutes initiating effective uterine contractions, which will help in cervical dilatation and eventually ending in delivery of baby per vaginally before the onset of spontaneous labour. A number of clinical conditions often pose potential risks to the mother and the baby if pregnancy is continued and so induction of labour is indicated or opted for in some situations. Induction of labour is done for patient's or obstetrician's convenience.

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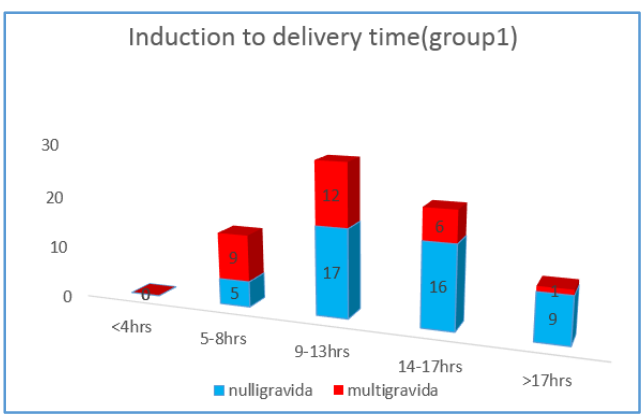
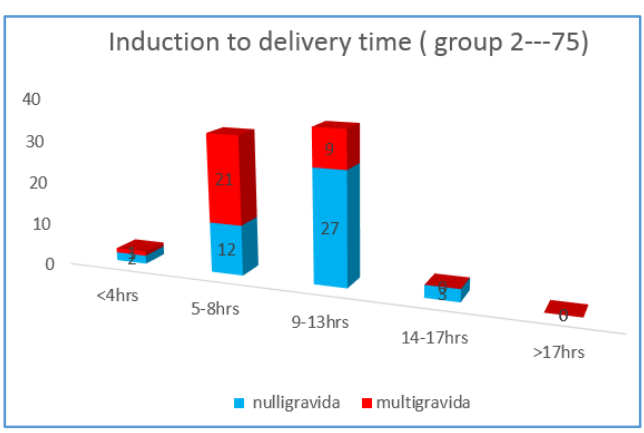
The overall frequency of labour induction more than doubled, rising from 9.5 to 23.2 percent (Martin JA 2011).[1] and early term (in the 37th and 38th week of gestation) inductions quadrupled, rising from 2 to 8 percent (Lee TA, Holl JL 2011).[2] Induction of labour is not completely free of risk. One has to keep in mind the potential risks such as failure if induction is ending in caesarean section, possibilities of preterm delivery and risks of hyperstimulation leading to fetal hypoxia and even death. (Rouse DJ 2000).[3] Various methods have been in use, out of which Oxytocin+Prostaglandin+ARM have been in use. Prostaglandins have the advantage of ripening the cervix before the onset of labour pains. ACOG Committee on Practice Bulletins, the National Institute for Health and

Clinical Excellence (NICE) and the Society of Obstetricians and Gynecologists of Canada (SIGC) guidelines for labour induction are followed. The major concerns associated with elective induction of labour at term are the potential for increased rates of caesarean delivery, neonatal morbidity, prematurity or early term birth and cost. Potential advantages to scheduled induction of labour, such as reduction in term stillbirth, macrosomia and its consequences and meconium passage (but not meconium aspiration) [Ehrenthal DB 2011]. There are insufficient data to recommend for or against elective induction of labour at >39 weeks of gestation. The various complications of induction of labour are tachysystole (more than 5 contractions in 10-minute average over a 30-minute period, the presence or absence of associated fetal heart rate changes are stated). Other complications are uterine rupture occurs in women with a scarred uterus and in multiparous women, amniotic fluid embolism, hyponatremia, hypotension, neonatal hyperbilirubinemia, fever, chills, vomitings and diarrhoea. We followed the guidelines of United States National Institute of Child Health and Human Development, Society of Maternal and Fetal Medicine (SMFM), ACOG for defining failed induction as failure to generate regular contractions and cervical change with oxytocin administration for 12 hours after rupture of membranes. Cervical ripening with prostaglandins over a period ranging from a single dose to several doses performed prior to oxytocin induction. Misoprostol PGE1 synthetic analogue when used compared to conventional methods for induction showed shorter induction delivery interval and it is cheaper and widely available and stable at room temperature having few side effects compared to other methods (Hofmeyr GJ 2003).[4] Recent several studies compared the Misoprostol vaginal and oral route and sub lingual route. Several randomized trials have evaluated the effectiveness of Misoprostol for labour induction with a viable fetus (Weeks A 2007).[5] Cochrane meta-analysis shows that Misoprostol when used in low doses is as effective as vaginal dinoprostone and with no excess of hyperstimulation (Eroglu 2007).[6] The appropriate dosage of vaginal misoprostol appears to be 25 microgram rather than 50 micrograms, as although both are effective the 25 microgram dose reduces the risk of hyperstimulation (Sanchez-Romos L 2002).[7]

METHODS: All women requiring induction of labour at term are assessed. The inclusion criteria for this study are post-term pregnancy, PROM in greater than 37 weeks gestation, IUGR at 37 weeks gestation provided Doppler studies are normal until this gestation, PIH, abruption placenta, eclampsia, HELLP syndrome, diabetes complicating pregnancy, IUD, foetal macrosomia in some cases of advanced maternal age. All the following women were excluded from study. Women with previous uterine scar, previous multiple caesarean sections, unexplained maternal pyrexia, previous traumatic or difficult delivery, previous uterine rupture, abnormal fetal presentation, unexplained uterine bleeding, placenta previa, vasa previa, cord prolapse, category 3 foetal heart tracing. BISHOP's prelabour scoring system was used to assess whether the cervix was favorable for induction of labour or not. From January 2013 - September 2014 total of 150 women given consent to participate in the trial and were randomized into two groups. All inductions were carried out on an inpatient basis. All women had electronic fetal heart monitoring following 45 minutes prior to and following misoprostol administration. Women had the tablet placed by the postgraduate in the vagina. Tablet misoprostol 25 micrograms placed every 4th hourly for a maximum of 6 doses. Every 4th hourly pelvis examination is done to note the progress of labour in terms of dilatation, effacement and descent of the presenting part the dose is repeated. At about 3-4 cm of cervical dilatation if the membranes have not ruptured ARM was done and color of liquor noted and its correlation with fetal heart rate assessed. Depending on the color and fetal heart rate pattern women were subjected to caesarean section or allowed to continue for vaginal delivery. If there is fetal distress tachysystoly or hyperstimulation next dose of misoprostol is deferred. After the baby is delivered APGAR at 1min, 5mins and 10mins was recorded. Babies with need for neonatal resuscitation and neonatal asphyxia were shifted to NICU.

OBSERVATIONS AND RESULTS:





Time in Hours	Unfavorable cervix (%)	Favorable cervix (%)
<4	0	3(4%)
5-8	14(18.6%)	33(44%)
9-13	29(38.6%)	36(48%)
14-17	22(29.3%)	3(4%)
>17	10(13.3%)	0
Comparing Group 1 and Group 2 (Induction to delivery time)		

T-test value is 6.478 and the 'p' value is <0.05 significant. The average time from induction to vaginal delivery was 12.87±4.65 hours in Group 1 (unfavorable cervix) and 8.85±2.68 hours in Group 2 (favorable cervix).

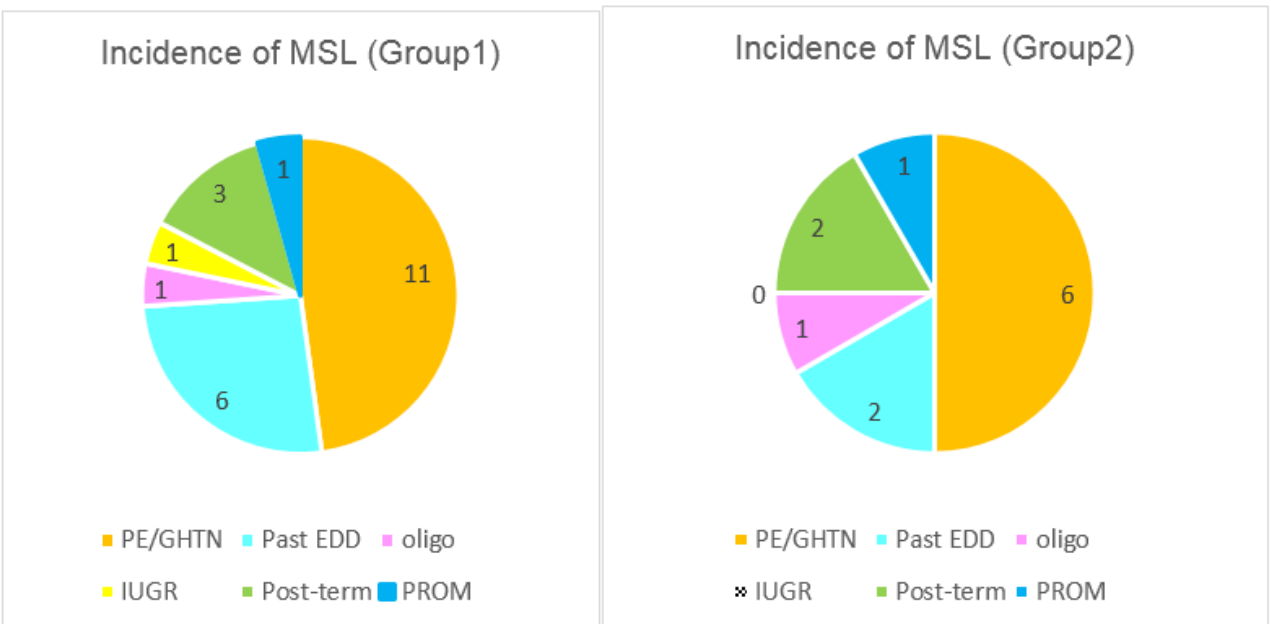
Mode of delivery	Unfavorable cervix n (%)	Favorable cervix n (%)
SPVD	50(66.6%)	65(86.6)
Outlet forceps	4(5.3%)	1(1.3%)
Caesarean section	21(28%)	9(12%)
Comparing Group 1 and Group 2 (Mode of Delivery)		

No. of doses	Unfavorable cervix n (%)	Favorable cervix n (%)
1 dose	10(13.3%)	31(41.3%)
2doses	28(37.3%)	37(49.3%)
3 doses	28(37.3)	6(8%)
4 and above doses	9(12%)	1(1.3%)
Number of doses of misoprostol (25 micrograms)		

T-test value is 6.099 p value <0.05 significant.

Complication	Group 1 N (%)	Group 2 N (%)
Hyperstimulation	6	2
Tachysystoly	2	1
Diarrhoea	3	2
Vomitings	5	2
Hyperpyrexia	2	0
Maternal complications in study groups		

Incidence of meconium stained liquor based on Indication of Induction:



Parity	Grade 1 MSL	Grade 2 MSL	Grade3 MSL	Total
Nulli Gravida	6 (12.7%)	10 (21.3%)	3 (6.4%)	19 (40.4%)
Multi Gravida	2 (7.1%)	2 (7.1%)	0	4 (14.3%)
Group 1: Incidence of Meconium Stained Liquor based on parity				

T-test value is – 2.545 p value <0.05 significant.

Statistical analysis was performed comparing Nulligravida and multigravida. T-test value is 2.545 and p value is 0.013 which is significant.

In unfavorable group**,** Incidence of MSL is more in Nulligravida (41.9%) than Multigravida (15.8%).

Parity	Grade1 MSL	Grade2 MSL	Grade3 MSL	Total
Nulli Gravida	1(2.3%)	5(11.4%)	2(4.5%)	8(18.2%)
Multi Gravida	3(9.7%)	1(3.2%)	0	4(12.9%)
Group 2				

T-test value is -1.320 p value >0.05, not significant.

Statistical analysis was performed comparing nulligravida and multigravida. T-test value is 1.320 and p value is 0.191, which is not significant.

Grade of MSL	NICU admissions	APGAR <7 at 5mins	Meconium aspiration syndrome	Neonate after 1 week
Grade 1 MSL	8	0	0	Baby well with mother
Grade 2 MSL	12	3	3	1 baby in NICU and others well with mother
Grade 3 MSL	3	2	2	1 Baby in NICU and Others well with mother
Group 1: Neonatal Outcome According To Grades of Meconium Stained Liquor				

Grade of MSL	NICU admissions	APGAR <7 at 5mins	Meconium aspiration syndrome	Neonate after 1 week
Grade 1 MSL	4	0	0	Baby well with mother
Grade 2 MSL	6	2	1	Baby well with mother
Grade 3 MSL	2	1	1	1 Baby in NICU and others well with mother
Group 2				

DISCUSSION: Misoprostol is an effective drug for induction of labour at term, previous reviews have shown trend towards meconium passage with misoprostol than with other drugs, several meta-analysis were done comparing 25 and 50 microgram dosages (Srisomboon J (1998).[8] In the current study, a dosage of 25 microgram of misoprostol has been used intravaginally every 4 hrs. for the maximum of 6 doses. (over 24-hr period). This dose of misoprostol (25 micrograms, 4th hrly, max – 6 doses) was found to be safe, efficacious and has low incidence of side effects with maternal and fetal outcome.

Procedure Method: One hundred and fifty women were randomly recruited into the study. All these cases, 150 women were induced with 25 mcg misoprostol 4th hrly. Among 150 cases, 75 women were included in the unfavorable cervix group and 75 were included in favorable cervix group. Among the total number of cases after 8 hrs. of induction, only 12 cases were having poor Bishop's score. Among these, 10 cases were nulligravida. This suggests that misoprostol is very effective agent for cervical ripening. The average time from induction to vaginal delivery was 13.95 hrs. in nulligravida and 11.05 hrs. in multigravida in group 1. In Group 2 induction delivery interval is 9.68 hrs. in nulligravida and 7.64 hrs. in multigravida, overall induction delivery interval is 12.87 hrs. in Group 1 and 8.85 hrs in Group 2. Induction delivery interval is longer in unfavorable cervix group and in nulliparous women. This might be one of the contributing factors in incidence of MSL. Average number of misoprostol doses required for vaginal delivery in case of nulligravida and multigravida are 2.72 and 2.14 respectively in Group 1. Average number of doses required for vaginal delivery case of nulligravida and multigravida are 1.90 and 1.38 respectively in Group 2. Average number of misoprostol doses required is higher in unfavorable cervix group and nulliparous women. This might also be one of the contributing factors in incidence of MSL (Rekha Kumari 2012).[9] Tachysystoly was observed in 2 cases in Group 1 and 1 case in Group 2. Low incidence of tachysystoly and uterine hyperstimulation in both groups may be due to low dose of misoprostol used in study. The total incidence of meconium stained liquor is 30.6% in unfavorable cervix and 16% in favorable cervix group, which is statistically significant. In unfavorable cervix group, incidence of MSL is 42.3%, 31.6% 12.5%, 16.7%, 75% and 8.3% in PE/GHTN, PEDD, Oligo, IUGR, post-term and PROM cases respectively. In unfavorable cervix group, incidence of MSL based on parity is 40.4% and 14.3% in primigravida and multigravida respectively. In favorable cervix group, incidence of MSL based on parity is 18.2% and 12.9% in primigravida and multigravida respectively. Meconium aspiration syndrome and low Apgar score is found in 5 babies of women with unfavorable cervix Group 2 babies of women with favorable cervix group and meconium aspiration syndrome and 3 babies had low APGAR scores. After 1 week of delivery, 2 neonates in Group 1 and 1 neonate in Group 2 were still admitted in NICU. Rest of the neonates were well with their others. Apart from MSL, other foetal outcomes were similar in both study groups.

CONCLUSION: Misoprostol is an effective priming and labour inducing agent. Incidence of meconium stained liquor is higher in misoprostol induced labour among women with unfavourable cervix. Some more studies are needed for evaluating better foetal outcome.

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