A Comparative Study of Oral versus Vaginal 25µg Misoprostol for Cervical Ripening and Induction of Labour in Prelabour Rupture of Membranes

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Abstract: The objective of the study is to compare the safety and efficacy of equivalent doses of orally and vaginally administrated misoprostol in induction of labour in Primigravida at 37-42 weeks of gestation with vertex presentation with prelabour rupture of membranes. 100 patients divided in oral, 50 cases (mean gestational age group 37 weeks 2 days) and vaginal group, 50 cases (mean gestational age group 38 weeks 3 days) received Tab. 25 µg of misoprostol every 4 hourly either orally or digitally administered in the posterior fornix in the vaginal group. Maximum up-to 6 doses in both groups. Primary outcome of the study was induction delivery interval in oral group 22.90 hours and in vaginal group 17.38 hours. The mean BISHOP score for oral and vaginal group was 4.6 and 5.7 respectively after 8 hours of administration of misoprostol. Vaginal group requires less oxytocin augmentation for delivery. APGAR score at 1 minute in oral group was 7.56 and for vagina group was 7.48. NICU admissions are statistically not significant. The mean induction delivery interval was significantly shorter in vaginal group, the cause of which could be longer duration action, no first pass metabolism and direct action of vaginal misoprostol on uterus on cervix. In oral group failed induction was observed in 6% cases, whereas in vaginal group, no induction failure was observed. Vaginal misoprostol is more effective than oral misoprostol for induction of labour.

Keywords: Primigravida, misoprostol, oxytocin

INTRODUCTION

Induced labour is one in which pregnancy is terminated artificially, any time after fetal viability is attained, by a method that aims to secure vaginal delivery. The aim of induction of labour has always been to improve the outcome when it is perceived that allowing the pregnancy to continue in its course, would present some jeopardy to the mother, her baby or both. The risk of induction should never be allowed to exceed the dangers of allowing the pregnancy to continue. The ideal inducing method should be safe for the mother and the fetus, inexpensive, easy, simple to use and reversible. The induction of labour has two components cervical ripening and stimulation of uterine contraction. To achieve dilatation of cervix and delivery of the fetus. It is well recognized that the success of induction of labour which ultimately aims at achieving the vaginal delivery depends to a great extent on the favourability of cervix or its rediness to go into labour. Misoprostol is a synthetic prostaglandin E1 analogue used originally for the prevention and treatment of peptic ulcer caused by the prolonged use of NSAIDs. Its use as a cervical ripener and labor inducer is upcoming and being tried enthusiastically by obstetricians worldwide. With time it has crossed the legal hurdles in Western as well as developing countries including India. It has advantage of being cheap, stable at room temperature and easy to be administered by various routes i.e. vaginal, oral, sublingual or rectal. Absorption by oral route is erratic, at the same time it is more rapid than vaginally administered misoprostol reaching peak serum concentration within 30 minutes compared to one hour with vaginal route. Oral misoprostol is eliminated rapidly (2-3 h) than vaginal (≥ 4h). The success of
induction of labour primarily depends on the status of cervix at the time of induction. A prepared/ripe cervix has far better chance of successful induction of labour than an unripe cervix. A successful induction of labour leads to vaginal delivery of the infant in a good condition, in an acceptable time frame and with minimum maternal discomfort or side effects[3].

AIMS AND OBJECTIVES

AIM
The main aim of this study to compare safety and efficacy of equivalent doses of orally and vaginally administrated misoprostol in induction of labour in Primigravida at 37-42 weeks of gestation with vertex presentation with prelabour rupture of membranes

OBJECTIVES
- Induction to delivery interval
- Number of Doses required for delivery
- Need of Oxytocin augmentation for delivery
- Maternal Outcome
- Mode of Delivery
- Maternal Complications
- Foetal Outcome
- Meconium Stained Amniotic Fluid
- NICU Admissions

METHODOLOGY
- Cases for the present study were taken in the Department of Obstetrics & Gynaecology, Gauhati Medical College and Hospital, Guwahati from the period 1st June, 2016 to 31st May, 2017.

Study design
Prospective observational study

Inclusion criteria
Primigravida at 37-42 weeks of gestation with Vertex Presentation with Prelabour Rupture of Membranes.

EXCLUSION CRITERIA
- Multigravida
- Multiple pregnancy
- Pregnancy with medical disorder like heart disease, DM Etc.
- Pregnancy complications like placenta praevia, abortion placenta, IUGR,
- Polyhydramnios, Oligohydramnios etc.
- Case with Contraindications of prostaglandins.

The cases were divided into two groups of 50 each to receive misoprostol 25μg 4th hourly either by intravaginal or oral route. In all patients, the cervical status was assessed by using Bishop Score prior to induction.

After taking written informed consent about the route of administration of drug, mechanism of action of drug side effects of the drug, maternal and fetal complications, and detail history was taken. Baseline investigations were reviewed as per antenatal protocol. Expected dates were confirmed by history and serial (1, 2 and 3 trimester) USG. Clinical examination with per abdominal examination was done to confirm lie, presentation, gestational age and amount of liquor. Vaginal examination was done and BISHOP score was assessed.

The adverse effects like tachysystole, hypertonus and uterine hyperstimulation was watched for. Tachysystole was defined as 6 or more contractions in 10 min for 2 consecutive 10 minutes period. Hypertonous defined as single contraction lasting more than 2 minutes. Uterine hyperstimulation was defined as tachysystole as well as hypertonus uterine contraction associated with fetal tachycardia or bradycardia.

RESULTS
The present study is the analysis of 100 cases of Primigravida at 37-42 weeks of gestation with Vertex presentation with prelabour rupture of membranes admitted and treated in the Department of Obstetrics and Gynaecology, Gauhati Medical College and Hospital, Guwahati, Assam. The maternal outcome was observed and analysed during the period of hospital stay. The fetal outcome of 100 cases of prelabour rupture of membranes was observed and analysed up to the first week of neonatal life. The study covered a tenure of one year from 1st June, 2016 to 31st May, 2017. The number of patients for the study were 100 divided into 2 group of 50 each either oral or vaginal. Qualitative data are expressed in the form of percentage and quantitative data as mean ± standard deviation, p-value.

Indication for Induction
Primigravida at 37-42 weeks of gestation with Vertex presentation with prelabour rupture of membranes.

<table>
<thead>
<tr>
<th>Table-1: showing mean gestational age</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
</tr>
<tr>
<td>----</td>
</tr>
<tr>
<td>Oral</td>
</tr>
<tr>
<td>Vaginal</td>
</tr>
</tbody>
</table>

Available online at http://saspublisher.com/sjams/
Vaginal Group

Mean gestational week for induction of labour was 38 weeks, 3 days

Oral Group

Mean gestational week for induction of labour was 38 weeks, 2 days

Table 2: Number of Doses of Drug Required for Delivery

<table>
<thead>
<tr>
<th>Dose</th>
<th>Number of Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Oral</td>
<td>2</td>
</tr>
<tr>
<td>Vaginal</td>
<td>14</td>
</tr>
</tbody>
</table>

- Majority of cases (48%) required 2 doses in Vaginal Group
- Majority of cases (48%) required 3 doses in Oral Group

Table 3: Response to Drug in terms of Bishop Score

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
<th>‘t’ value</th>
<th>‘p’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Induction Bishop</td>
<td>Oral</td>
<td>50</td>
<td>4.3</td>
<td>0.966</td>
<td>1</td>
<td>5</td>
<td>1.368</td>
</tr>
<tr>
<td></td>
<td>Vaginal</td>
<td>50</td>
<td>3.3</td>
<td>1.326</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6 Hours Bishop Score</td>
<td>Oral</td>
<td>50</td>
<td>6.2</td>
<td>1.0</td>
<td>2</td>
<td>6</td>
<td>10.276</td>
</tr>
<tr>
<td></td>
<td>Vaginal</td>
<td>50</td>
<td>5.7</td>
<td>1.744</td>
<td>3</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

For Vaginal group
Mean bishop score was 5.70 after 8 hours.

For Oral group
Mean bishop score was 4.60 after 8 hours.

Table 4: Requirement of Augmentation with Oxytocin

<table>
<thead>
<tr>
<th>Dose</th>
<th>Augmentation with Oxytocin</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Oral</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>60.0%</td>
<td>40.0%</td>
</tr>
<tr>
<td>Vaginal</td>
<td>16</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>32.0%</td>
<td>68.0%</td>
</tr>
</tbody>
</table>

For Oral Group
- 30 cases (60%) required augmentation
- 16 cases (32%) required augmentation with Oxytocin
- Rest 34 cases (68%) did not require any augmentation

For Vaginal Group

Table 5: Induction to Delivery Interval

<table>
<thead>
<tr>
<th>N</th>
<th>Mean Induction to delivery Interval (Hrs.)</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
<th>‘t’ value</th>
<th>‘p’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>50</td>
<td>22.90</td>
<td>4.062</td>
<td>10</td>
<td>28</td>
<td>42.603</td>
</tr>
<tr>
<td>Vaginal</td>
<td>50</td>
<td>17.38</td>
<td>4.389</td>
<td>8</td>
<td>26</td>
<td></td>
</tr>
</tbody>
</table>

Induction to Delivery Interval

In Oral group
Mean induction to vaginal delivery interval was 22.90 hours

In Vaginal group
Mean induction to vaginal delivery interval was 17.38 hours

Failed Induction
The incidence of failed induction was 6% (3 cases), reported in oral group only
Table 6: Mode of Delivery

<table>
<thead>
<tr>
<th>Dose</th>
<th>Normal</th>
<th>Caesarean Section</th>
<th>Forceps</th>
<th>Vacuum</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>34</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>68.0%</td>
<td>12.0%</td>
<td>4.0%</td>
<td>16.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Vaginal</td>
<td>38</td>
<td>4</td>
<td>1</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>76.0%</td>
<td>8.0%</td>
<td>2.0%</td>
<td>14.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Mode of delivery

For oral group
68% (34 cases) proceeded for normal delivery
12% (6 cases) required LSCS intervention

For vaginal group
76% (38 cases) proceeded for normal delivery
8% (cases) required LSCS intervention

Liquor Characteristic

For oral group
80% (40 cases) exhibited clear liquor
8% (4 cases) exhibited thick MSAF

For vaginal group
76% (38 cases) exhibited clear liquor
8% (4 cases) exhibited thick MSAF

Table 9: Maternal Complication

<table>
<thead>
<tr>
<th>Maternal Complication</th>
<th>Dose</th>
<th>Diarrhoea</th>
<th>Fever</th>
<th>TachySystole</th>
<th>Uterine hyperstimulation</th>
<th>No Complication</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td></td>
<td>3 (6.0%)</td>
<td>1(2.0%)</td>
<td>0 (0.0%)</td>
<td>1 (2.0%)</td>
<td>45 (90.0%)</td>
<td>50 (100.0%)</td>
</tr>
<tr>
<td>Vaginal</td>
<td></td>
<td>0 (.0%)</td>
<td>2 (4.0%)</td>
<td>2 (4.0%)</td>
<td>2 (4.0%)</td>
<td>44 (88.0%)</td>
<td>50 (100.0%)</td>
</tr>
</tbody>
</table>

Maternal Complication

For Oral group
90% (45 cases) encountered no maternal complication

For Vaginal group
88% (44 cases) encountered no maternal complication

Table 10: APGAR score at 1 and 5 minutes

<table>
<thead>
<tr>
<th>APGAR at 1 min</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
<th>‘F’ value</th>
<th>‘p’ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>50</td>
<td>7.56</td>
<td>1.013</td>
<td>4</td>
<td>8</td>
<td>0.159</td>
<td>0.691</td>
</tr>
<tr>
<td>Vaginal</td>
<td>50</td>
<td>7.48</td>
<td>.995</td>
<td>5</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>APGAR at 5 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>50</td>
<td>8.70</td>
<td>.735</td>
<td>6</td>
<td>9</td>
<td>0.081</td>
<td>0.776</td>
</tr>
<tr>
<td>Vaginal</td>
<td>50</td>
<td>8.74</td>
<td>.664</td>
<td>7</td>
<td>9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

APGAR score

APGAR score of the neonate was recorded at 1 minute and 5 minutes after birth

For Oral Group
- Mean 1 minute score was 7.56
- Mean 5 minutes score was 8.70

For Vaginal Group
- Mean 1 minute score was 7.48
- Mean 5 minutes score was 8.74

Table 11: Neonatal Complications

<table>
<thead>
<tr>
<th>Dose</th>
<th>Neonatal Complication</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NICU Admission</td>
<td>No Complication</td>
</tr>
<tr>
<td>Oral</td>
<td>4</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>8.0%</td>
<td>92.0%</td>
</tr>
<tr>
<td>Vaginal</td>
<td>5</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>10.0%</td>
<td>90.0%</td>
</tr>
</tbody>
</table>
For Oral Group
- 8% (4 cases) of neonates required NICU admission due to neonatal complication.

For Vaginal Group
- 10% (5 cases) of neonates required NICU admission due to neonatal complication

DISCUSSION
The present study is an analysis of the maternal and fetal outcome in 100 cases of misoprostol in induction in primigravida at 37-42 weeks of gestation with vertex presentation with prelabour rupture of membranes in the Gauhati Medical College and Hospital, Guwahati, Assam. In the present study, majority of cases were booked 81%, 62% cases were seen from the rural area and 38% from the urban area. Age and gestational age were compatible. Statistical analysis shows that difference in the mean gestational age was statistically insignificant (p=0.322).

Before induction of labour, cervical scoring was done by Bishop’s score and for both the groups, next cervical scoring was done after 8 hours. Before administrating next dose of misoprostol, PV examination was done. Mean pre-induction bishop score for Oral group was 2.82 ± 1.466. For vaginal group, the mean value was 3.14 ± 1.262 which was statistically insignificant (p = 2.45). After 8 hours, the bishop score for oral group had a mean of 4.6 ± 1.714 and for vaginal group, the mean was 5.7 ± 1.717, which was statistically significant (p = 0.002). It indicates that the improvement in cervical score was significantly more in vaginal group as compared to the oral group after the first dose.

In the present study, it was found that 30(60%) cases in oral group and 16 (32%) cases in vaginal group required augmentation with Oxytocin. The difference was statistically significant (p = 0.005) indicating that oral administration of Misoprostol for induction of labour requires additional methods of labour augmentation, such as Oxytocin drips. The findings were consistent with the previous studies; Stephanie A. et al. [50], Sheikher C. et al.[33].

Induction to Vaginal Delivery Interval, the induction to delivery interval is one of the primary outcomes of the present study. In Oral group, the mean interval was 22.90 hours and the same in vaginal group was 17.38 hours. The difference is statistically significant (p < 0.001) and the findings were more or less same with the previous study Sheikher C. et al. [33], and Pratima Mittal et al.[40], indicating that vaginal route of administration leads to lesser induction to delivery interval as compared to the oral route.

In the present study, 3 cases (6%) in oral group failed to proceed to active labour, while there was no failure of induction in the vaginal group, though the difference was statistically insignificant (p = 0.079). It was consistence with the previous studies Shetty et al. and Sheikher C et al.[33].

In the oral group, 34 cases (68%) proceeded for unassisted vaginal delivery. Another 10 cases required assistance in terms vacuum and forceps. Of these, 8 (16%) required vacuum extraction and remaining 2(4%) required Forceps delivery.

In vaginal group, 38 (76%) cases proceeded to unassisted vaginal delivery and 8 (16%) cases required assistance in terms of vacuum and forceps. Majority of the assisted vaginal deliveries were meant to cut short the second stage of labour as these cases had Meconium stained liquor. The findings of Abbasi R.M. et al.[32], and Sheikher C. et al.[33], were in accordance with those of present study.

In oral group, a total of 6 cases (12%) required emergency LSCS and previous study show similar trend. Failed induction was the main reason for LSCS in oral group. There was no failure of induction observed in the vaginal group.

In the present study, in oral group, 80% of the cases had clear liquor. Of the remaining 10 cases (20%), 6 (12%) had thin Meconium Stained Amniotic Fluid (MSAF) and 4 (8%) had thick Meconium Stained Amniotic Fluid (MSAF). The findings of the present study are less similar with the previous studies Shetty A. et al.[23] Stephanie et al.[31].

In the present study, 10% cases developed some kind of maternal complication in oral group and 12% cases were experienced maternal complications in vaginal group. The findings are same pattern and are consistent with the previous studies.

APGAR score in oral group, only 1 case resulted in APGAR score < 6 at 5 minutes and the vaginal group did not have any such case. These differences were statistically insignificant (p = 0.315). The findings of Khatri R. et al.[32], and Sheikher C. et al.[33] are similar with the present study.

In the present study, 4 cases (8%) developed neonatal complications. Of these, 3 required NICU admission for respiratory distress and 1 for Meconium stained condition and similar with the previous studies Stephan et al.[40], Wing A.D. et al.[41].

CONCLUSION
From the present study it can be concluded that the vaginal misoprostol is more effective in comparison...
to oral misoprostol for induction of labour when administered in similar dosage of 25μg. The vaginal route requires laser dosage, the induction delivery interval and the incidence of failed induction is also less in this group. With respect to the neonatal outcome no significant statistical difference was noted in either of the groups.

REFERENCE

16. Collins PW. Medicinal Research Reviews. 1990; 10(2) : 149-172pp

Bangladesh College of Physicians and Surgeons. 2008 Jan;26(1).