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Research Article

Oral Misoprostol versus Oxytocin induction for postdate pregnancy: randomized clinical trial study

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ABSTRACT*:*
Background: Postdate pregnancy increases prenatal mortality and maternal problems. The induction is more recommended if allowing pregnancy to continue has high risks. Many researches showed that induction in postdate pregnancy had positive effects in decrease of labor duration, rate of cesarean section and days of hospitalization. The most important factor in successful induction is cervix ripeness. There are many difference methods for ripening cervix and effective delivery such as using Misoprostol. The objective of our study was comparing use of oral Misoprostol against Oxytocin induction for postdate pregnancy termination.
Material & Methods: This is a randomized clinical trial study which was performed on 80 hospitalized pregnants in " Emam Khomeini " hospital, Sari, Iran, 2014. The inclusion criteria included singleton nullipar pregnancy,gestational age of ≥ 40 weeks, unripe cervix and Bishop Score of ≤ 5. The patients were divided in 2 groups randomly. Group I included 40 pregnants whose labor was induced with Misoprostol (50 mg,oral,QID, max for 5 doses). Group II included another 40 pregnants who were induced with Oxytocin (2 mU/min, intravenously, max 40 mU/min). Our failure criterion was no delivery promotion a□er 24h of uterotonic agents' administration. Statistical data was analyzed with SPSS-16 Software and Chi square, T- tests.
Results: In Misoprostol group the induction- active labor interval and also delivery duration were significantly less than the other group. (P=0.0001) The frequency of cesarean delivery in Oxytocin group was more than group I. (P=0.001) Also the average duration of hospitalization with Oxytocin induction was higher than group I. (P=0.0001)
Conclusion: In the induction of postdate pregnancy by Misoprostol is more appropriate in comparison with Oxytocin because of decrease in rate of C/S and also duration of labor.

Keywords: Oral Misoprostol, Oxytocin, Bishop Score, Postdate pregnancy.
Abrevation: QID: four times per day, C/S; cesarian section, PG; prostaglandin, IUGR; intra uterine growth retard, NICU; neonate intensive care unit,

INTRODUCTION:

Postdate pregnancy includes pregnancies that last longer than 40 weeks. The reported frequency is approximately 30%. This is one of the worried situations that need special attention of doctors, midwives and other health providers. It may cause fetal distress and macrosomia, oligohydramnios, meconium aspiration, placental insufficiency and increase prenatal death and C/S rate. Because of the definite complications of postdate pregnancy, today it is accepted that doing interventions but there is controversy about the best managing method (uterotonic agents ,induction time..) for induction specially with unripe cervix.(1-3)
Induction of labor is indicated when it is felt that benefits of finishing pregnancy outweigh the

potential maternal and fetal risks of continuing it. The cervix ripening is the most important predictor of success so it must be established with Bishop Score of the cervix which includes dilatation, Effacement, Fetal station, consistency and position of the cervix.

A Bishope Score around 10 is considered favorable and is likely to result successful labor induc□on but Bishop Score less than 7 is counted as unfavorable cervix. Nowadays many researches have done through finding more appropriate way for cervix ripening before the induction beginning. The common purposes of studies are decrease duration of labor, cost and days of hospitalization and also rate of cesarean section(C/S).There are many different methods for ripening cervix and effective delivery such as using PG E1, PG E2, Laminaria , Oxytocin and stripping. Oxytocin is still the favorable agent for labor induction but sometimes it takes more times to occur delivery especially in nullipars. This prolonged procedure has bad effects on pregnants and do not tolerate with them (1-3). Such role of these components can be examined applying computational methods which has been conducted to model biomolecules like HDL (high density lipoprotein) in the body (4,5). On the other hand some studies suggested that Misoprostol is significantly associated with a higher incidence of vaginal delivery with 24h of application, lower overall rate of C/S and also duration of labor.(6-12) So the objecive of our study was comparing the use of oral Misoprostol against Oxytocin induction for postdate pregnancy termination.

MATERIAL & METHODS:

This is the randomized control trial study which was performed on 80 hospitalized pregnants in “Emam Khomeini “hospital, Sari, Iran, 2014. The inclusion criteria included singleton nullipar pregnancy, gestational age of ≥ 40 weeks, unripe cervix, Bishop Score of ≤ 5 and no contraindication to vaginal delivery. Our exclusion criteria were non vertex position, intrauterus fetal death, previous C/S or other types of uterine surgery, oligohydramnios, IUGR, multiples pregnancy, placemta previa or abnormal bleeding , multiparity , over 4 kg birth weight estimation and some maternal diseases (cardiopulmonary disease,Liver disorder, electrolytes disorders, Diabetes, eclampsia and preeclampsia).After complete introducing to patients about our study, the volunteers signed the ethical approval form then they were divided in 2 groups randomly. Group I included 40 pregnants whose labor was induced with Misoprostol (50 mcg, oral, QID, using a maximum of 5 doses). It is from Pharmacia Spain, S.A manufacture in form of 200mcg tablet. We divided it in 4 equal parts to achieve 50mcg. Group II included another 40 pregnants who were induced with Oxytocin (2 mU/min, intravenously, using a maximum of 40 mU/min).

It is an Iranian product of AbuReihan manufacture in form of 10mU vial. Our failure criterion was no delivery promotion after 24h of uterotonic agents’ administration. In group I after 4 hours of first 50 mcg Misoprostol if there were no adequate contractions (4 contractions in 10 minutes with at least 45-60 seconds' duration), the next dose must be used but it was not repeated more than 5 doses. In group II the recommended regimen is a starting dose of 2 milliun unites diluted Oxytocin per minute (to reduce error, a standard dilution should always be used which includes 10 UI Oxytocin in 1000 ml of normal saline), increased at interval of 15 minutes. If there were no adequate contractions, the next dose must be 2 fold until the maximum dose of 40 mU/min. At the end especial data such as induction- active phase labor (4 cm dilatation) interval, induction- vaginal delivery interval, cesarean causes (uterine hyperstimulation, Misoprostol intolerancy), cesarean and vaginal frequencies and neonatal problems (1,5 min Apgar score, admission to NICU) were compared in 2 groups. Statistical data was analayzed with SPSS-16 Software, Chicago, IL, USA, and Chi square, T- tests.

RESULTS:

The age of our subjects was between 17-35 years and the average gestational age was 40.8 ± 0.16. (P=0.62) The average of Bishop Score was 2.3 ± 1.12. (P=0.92) So there were no statistical differences between the groups in average age, gestational age and Bishop Score. (Table 1)

In Misoprostol group the induction - active phase labor interval and also delivery duration were significantly less than the other one.(P=0.0001) The average duration of labor were 10 ± 4.4 h in group I and 16.6 ± 6.3 h in group II.(Table 2)

33 patients labor finished with vaginal delivery (82.5%) in group I but 18 patients in group II (45%). The difference was highly significant. (P=0.0001) Table 3. The incidence of meconium staining, labor arrest and failure induction in Oxytocin group found higher significantly. Fetal distress has not seen in Misoprostol group but has occurred for 5 patients in Oxytocin group. (Table 4)

The mean hospitalized days in Misoprostol group was 27.13 ± 20.44 days and in Oxytocin group was 49.08 ± 26.86 days. The difference was significant. (P= 0.0001)

There was no statistical difference about 1 & 5 minute Apgar score and mean birth weight in our 2 groups. There was no case of neonatal resuscitation or admission to a neonatal intensive care unit (NICU) or death in our groups and also no case of uterine hyperstimulation or Misoprostol intolerance.

DISCUSSION:

According to our study the duration of labor and cesarean delivery rate were lower in using Misoprotol. Misoprostiol and oxytocin were subject of different investigation (13,14,15).

It is the same as Nigam et al (6) study, but the vaginal delivery with Misoprostol in Nigam study was (91.7%) more than us (82.5%).

It seems this difference is due to different Bishop score in these studies.In our study there were statistical difference between both vaginal and cesarean delivery in 2 groups but this is against the Nigam study.The meconium staining in Misoprostol group was 5.6% that is almost the same in Nigam study. Some items such as neonatal prognoses, NICU admission and uterine hyper stimulation were not seen in both studies.(6)

In 1999 Kipikasa et al used outpatient oral Misoprostol for termination, their cesarean rate (23.1%) are the same as ours. (7)

Sahin et al (8) studied about use of vaginal Misoprostol in toxemia and non toxemia of pregnancy, 2001. The cesarean delivery rate in toxemia (73.8%) and non toxemia groups (86.4%) are the same as our study. Their average Bishop score (3.9) is higher than ours (2.3) and also their fetal distress (19% & 6.8% in toxemia and non toxemia groups respectively) is higher than ours. It seems it is due to the difference of Misoprostol usage (vaginal versus oral). (8)

Rozenberg et al study, the vaginal delivery rate was (81.4%) the same as ours in Misoprostol group but the induction – vaginal delivery interval with Misoprostol in theirs is about 13h which is more than ours. It may be due to their drug administra□on interval that was longer than us. (9)

Incerpi et al looked for the difference of C/S delivery between Misoprostol (25%) and placebo effect (17%) and found more hyperstimulation and tachysystole.(10)

Elhassan et al had 84.3% vaginal delivery with Misoprostol and 62.9% with Oxytocin and the duration of labor was significantly less than Oxytocin usage. These results are the same as ours. (10)

Feitosa et al showed that C/S delivery with sublingual Misoprostol (57%) was less than vaginal one (69%). This difference is due to vaginal usage which causes hyperstimulation, fetal distress and induction failure. (11) Seyfettin et al compared oral and vaginal Misoprostol in 2005 and found 12% C/S in oral group but they have higher failure rate (4%) than ours. It may be for their different Bishop score. Their induction – delivery interval was 9h that is the same as ours. (12) Afolabi EO et al (16) evaluated Oral misoprostol versus intramuscular oxytocin in the active management of the third stage of labour. They showed Oral misoprostol administration seemed to be as useful and as safe as intramuscular oxytocin injection in the active control of the third stage of labour. Ho M et al (17) compered oral misoprostol solution with intravenous oxytocin for labor augmentation. They indicated vaginal delivery happened in 92 women (78.0%) in the misoprostol group and for 97 women (85.8%) in the oxytocin group. they concluded Labor augmentation with oral misoprostol or intravenous oxytocin resulted in similar

outcoms. Inconsistent with the current research vaginal delivery was noted in 82.5% of Misoprostol group and 45 % of Oxytocin group. According to above, we suggest that Misoprostol is the more effective uterotonic agent for pregnancy termination than other agents. It has many benefits such as low cost, longer half-life, stable in room temperature and easy oral use instead of vaginal or intravenous products.

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Conflict of intrest: None to declare

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Table 1: Demographic distribution of the patients.

Title	Misoprostol	Oxytocin	P Value
Average age (year)	22.88 ± 4.03	23.33 ± 4.47	0.64
Average Gestational age(weeks)	40.8 ± 0.17	40.8 ± 0.15	0.62
Average Bishop score	2.3 ± 1.11	2.3 ± 1.13	0.92

Table 2: The average duration of delivery after induction.

Duration(hour)	Misoprostol	Oxytocin	P Value
Induction-active phase interval	6.2 ± 3.4	11.1 ± 5.9	0.0001
Induction- vaginal delivery interval	10 ± 4.4	16.6 ± 6.3	0.0001

Table 3: The frequency distribution of cesarean and vaginal deliveries.

Delivery	Misoprostol	Oxytocin	P Value
Cesarean	17.5 %	55%	0.0001
vaginal	82.5%	45%	0.0001

Table 4: The frequency causes of cesarean section.

Cesarean causes	Misoprostol	Oxytocin	P Value
Meconium staining	3(7.5%)	6(15%)	
Fetal distress		5(12.5%)	
Failure induction	3(7.5%)	6(15%)	
Labor arrest	1(2.5%)	5(12.5%)	
Total	7(17.5%)	22(55%)	0.007