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Effect of Vaginally Administered Glyceryl Trinitrate Placebo on Cervical Ripening Prior to Induction of Labor in Overdue Pregnancies

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Abstract

Background: The aim is to assess effect of vaginally administered glyceryl trinitrate placebo on cervical ripening prior to induction of labor in overdue pregnancies. **Subjects and Methods:** Eighty pregnancies were divided into 2 equal groups of 40. Group I women received vaginal suppositories-containing GTN inserted in posterior fornix and group II women received placebo. We prepared placebo and GTN involving vaginal ovules in the department of Pharmacy. All vital parameters such as blood pressure, heart rate, fetal heart rate and temperature was measured for 1 hour. **Results:** The mean age in group I was 27.2 years and in group II was 26.5 years. The mean body weight was 68.4 kgs in group I and 65.9 kgs in group II. Height found to be 1.56 meters in group I and 1.57 meters in group II. The mean BMI was 28.1 kg/m2 in group I and 27.7 in group II. Parity was 0.87 in group I and 0.94 in group II. Gravida was 2.45 in group I and 2.26 in group II. The mean Bishop score before, at 3rd hour, 6th hour and 12th hour recorded was 3.59, 4.45, 5.46 and 6.68 in group I and 3.56, 4.27, 5.04 and 6.42 in group II. Time period upto delivery (hours) was 5.42 and 18.5, period between drug administration and amniotomy (hours) was 9.24 and 10.6, period between drug administration and initiation of oxytocin (hours) was 10.8 and 12.1 and period between drug administration and active phase (hours) was 9.4 and 11.2 in group I and II respectively. Delivery was normal spontaneous delivery seen in 34 in group I and 30 in group II and caesarean section 6 in group I and 10 in group II. Adverse events found to be postpartum bleeding seen in 5 in group I and 4 in group II, uterine tachysystole in 3 in group I and 4 in group II and fetal distress 3 in group I and 1 in group II. The difference was non- significant (P> 0.05). **Conclusion:** There was no additional benefits of administration of Glyceryl trinitrate in posterior fornix in in cervical ripening in women with overdue pregnancies.

Keywords: Cervical Ripening, Overdue Pregnancies, Women.

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Introduction

In pregnancy induction of labour is need if there is failure of spontaneous labor crossing 41 gestational weeks.[1] Induction of labour is desirable in about 30%-35% cases of pregnancy. When there is danger to maternal and fetal life, induction of labour become mandatory.[2] It causes contraction of uterus, dilatation of cervix and starting of labor. There are numerous methods of induction such as pharmacological and mechanical.[3]

In cases of insufficient cervical maturation, labor induction is not easy and it prolongs.[4] In such incidents, ripening of cervix is essential requirement to induce induction.[5] There are certain requirement for a cervical ripening agent. It should not cause uterine hypertonicity, no need of fetal monitoring and have no fetal and maternal side effects.[6]

Based on the stimulatory effects of prostaglandins (PGs) on myometrium, the use has decreased nowadays in terms of cervical ripening.[7]

Locally administered glyceryl trinitrate (GTN) in the form of vaginal suppositories have been widely used as cervical ripening agent especially in pregnancies above 40 weeks and post-term (>42 weeks) pregnancies.[8] It is a nitric oxide donor. Nitric oxide has negligible adverse events and hence may be used in cervical ripening.[9,10] The present study was conducted to assess effect of vaginally administered glyceryl trinitrate placebo on cervical ripening prior to induction of labor in overdue pregnancies.

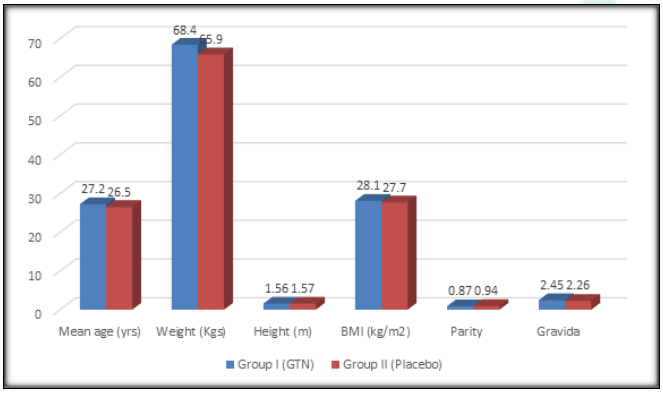
Subjects and Methods

A sum total of eighty pregnancies who gave their written consent for the participation of the study was selected. Approval for the conduction of the study was obtained from institutional ethical review board. Inclusion criteria was overdue pregnancies, no evidence of cervical effacement, fetal distress and absence of uterine contractions. Exclusion criteria comprised of multiple pregnancies, more than 6 Bishops score and malpresentation of fetus.

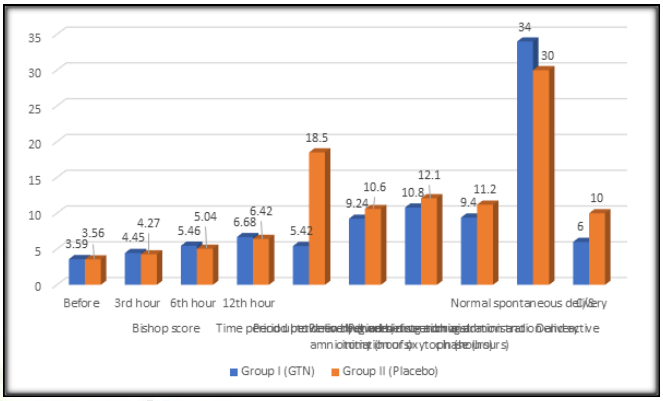
We divided women into 2 equal groups of 40. Group I women received vaginal suppositories-containing GTN inserted in posterior fornix and group II women received placebo. We prepared placebo and GTN involving vaginal ovules in the department of Pharmacy. All vital parameters such as blood pressure, heart rate, fetal heart rate and temperature was measured for 1 hour. Assessment of chest pain, palpitation and headache was performed. An expert gynaecologists did all vaginal examinations. Analysis of data was compared using Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

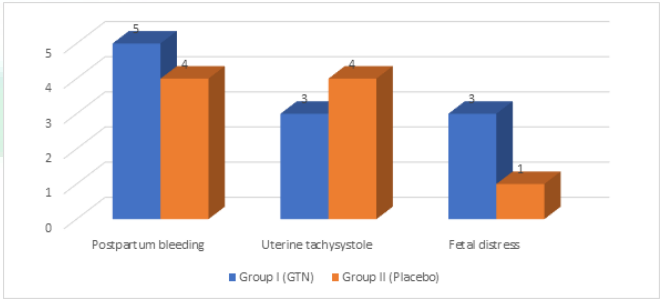
The mean age in group I was 27.2 years and in group II was 26.5 years. The mean body weight was 68.4 kgs in group I and 65.9 kgs in group II. Height found to be 1.56 meters in group I and 1.57 meters in group II. The mean BMI was 28.1 kg/m2 in group I and 27.7 in group II. Parity was 0.87 in group I and 0.94 in group II. Gravida was 2.45 in group I and 2.26 in group II. The difference between both groups was non- significant (P> 0.05) [Table 1, Figure 1].



The mean Bishop score before, at 3rd hour, 6th hour and 12th hour recorded was 3.59, 4.45, 5.46 and 6.68 in group I and 3.56, 4.27, 5.04 and 6.42 in group II. Time period upto delivery (hours) was 5.42 and 18.5, period between drug administration and amniotomy (hours) was 9.24 and 10.6, period between drug administration and initiation of oxytocin (hours) was 10.8 and 12.1 and period between drug administration and active phase (hours) was 9.4 and 11.2 in group I and II respectively. Delivery was normal spontaneous delivery seen in 34 in group I and 30 in group II and caesarean section 6 in group I and 10 in group II [Table 2, Figure 2].



Adverse events found to be postpartum bleeding seen in 5 in group I and 4 in group II, uterine tachysystole in 3 in group I and 4 in group II and fetal distress 3 in group I and 1 in group II. The difference was non- significant (P> 0.05) [Table 3, Figure 3].



Discussion

For ripening of cervix, numerous agents are available.[11,12] Glyceryl trinitrate is one of them which proved to be effective agent in this regard.[13,14] The present study was conducted to assess effect of vaginally administered glyceryl trinitrate placebo on cervical ripening prior to induction of labor in overdue pregnancies.

Our study showed that the mean age in group I was 27.2 years and in group II was 26.5 years. The mean body weight was 68.4 kgs in group I and 65.9 kgs in group II. Height found to be 1.56 meters in group I and 1.57 meters in group II. The mean BMI was 28.1 kg/m2 in group I and 27.7 in group II. Parity was

Table 1: Demographic data

Groups	Group I (GTN)	Group II (Placebo)	P value
Mean age (yrs)	27.2	26.5	>0.05
Weight (Kgs)	68.4	65.9	>0.05
Height (m)	1.56	1.57	>0.05
BMI (kg/m2)	28.1	27.7	>0.05
Parity	0.87	0.94	>0.05
Gravida	2.45	2.26	>0.05

Table 2: Parameters assessed in both groups

Parameters	Variables	Group I (GTN)	Group II (Placebo)	P value
Bishop score	Before	3.59	3.56	>0.05
	3^{rd} hour	4.45	4.27	>0.05
	6^{th} hour	5.46	5.04	>0.05
	12^{th} hour	6.68	6.42	>0.05
Time period upto delivery (hours)		5.42	18.5	>0.05
Period between drug administration and amniotomy (hours)		9.24	10.6	>0.05
Period between drug administration and initiation of oxytocin (hours)		10.8	12.1	>0.05
Period between drug administration and active phase (hours)		9.4	11.2	>0.05
Delivery	Normal spontaneous delivery	34	30	>0.05
	C/S	6	10	>0.05

Table 3: Adverse events in both groups

Adverse events	Group I (GTN)	Group II (Placebo)	P value
Postpartum bleeding	5	4	>0.05
Uterine tachysystole	3	4	>0.05
Fetal distress	3	1	>0.05

0.87 in group I and 0.94 in group II. Gravida was 2.45 in group I and 2.26 in group II. Dulger et al,[15] determined the effectiveness and adverse effects of local glyceryl trinitrate (GTN) application during labor compared with a placebo group. Vaginal suppositories‑containing GTN were given in 36 and placebo in 34 cases and results showed that there were no significant differences between the GTN and placebo groups regarding bishop scores, the interval between medication and delivery, delivery types, indications for cesarean section, and complications including hyperstimulation, tachysystole, uterine rupture, placental abruption, and uterine atony.

We found that the mean Bishop score before, at 3rd hour, 6th hour and 12th hour recorded was 3.59, 4.45, 5.46 and 6.68 in group I and 3.56, 4.27, 5.04 and 6.42 in group II. Time period upto delivery (hours) was 5.42 and 18.5, period between drug administration and amniotomy (hours) was 9.24 and 10.6, period between drug administration and initiation of oxytocin (hours) was 10.8 and 12.1 and period between drug administration and active phase (hours) was 9.4 and 11.2 in group I and II respectively. Delivery was normal spontaneous delivery seen in 34 in group I and 30 in group II and caesarean section 6 in group I and 10 in group II. Chanrachakul et al,[16] suggested that GTN was not as effective as PGE2 for the induction of labor because the latent phase, time until delivery and all stages of labor were longer in women who received GTN. The total amount of oxytocin used was also significantly higher in the GTN group in comparison to PGE2 group.

We showed that adverse events found to be postpartum bleeding seen in 5 in group I and 4 in group II, uterine tachysystole in 3 in group I and 4 in group II and fetal distress 3 in group I and 1 in group II. Bullarbo et al,[17] administered a single dose of IM and placebo tablets to the posterior vaginal fornix of 200 pregnant women whose gestational ages were beyond 42 weeks and compared adverse effects, C/S indications, and Bishop scores. They found no significant differences between the groups regarding Bishop scores, and they attributed this result to giving only a single dose of IMN.

Conclusion

Authors found that there was no additional benefits of administration of Glyceryl trinitrate in posterior fornix in in cervical ripening in women with overdue pregnancies.

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