

Comparison Between Glyceryl Trinitrate and Ritodrine As a Tocolytic Agent in Pre-Term Labour

Aisha Khalid, Asad Mahmood Khan, Attia Anwar, Mubin Yousaf, Obaid Anwar, Abida Parveen

ABSTRACT

Objective: To compare the efficacies between glyceryl trinitrate and Ritodrine as a tocolytic agent in pre-term labour. **Study design:** Descriptive cases series. **Settings:** District Head Quarter Hospital, Faisalabad-Pakistan. **Duration:** Six months from July 2017 to December 2017. **Methodology:** In this study the cases of age 20 to 40 years undergoing pre-term labour were included. The diagnosis of pre-term labour was made on the basis on clinical examination of regular rhythmic contraction at one/ every 10 minutes and dilation of cervix less than 3 cm. The cases in group A were treated with transdermal patch of glyceryl trinitrate (10 mg), which is replaced every 24 hours just below the umbilicus and those in group B were treated with Ritodrine infusion at a dose of 0.05 mg/mint for 24 hours and then tablet Ritodrine of 10 mg every 4 hour. The efficacy was labelled as yes where rhythmic these contractions stop for 12 hours. **Results:** In this study there were total 100 cases, 50 in each group. There was no significant difference in terms of mean age 31.23 ± 7.11 vs 30.12 ± 6.47 years in group A and B with $p = 0.45$. There were 16 (32%) cases in group A and 18 (36%) in B with history of C section with $p = 0.88$. The efficacy was seen in 44 (88%) of cases in group A as compared to 36 (72%) of cases in group B with $p = 0.03$. The mean time taken to stop contractions was 4.33 ± 2.56 vs 7.02 ± 3.39 in group A and B respectively with $p = 0.001$. **Conclusion:** Glyceryl trinitrate is significantly better than Ritodrine in stopping pre-mature labour and this difference is significantly better both in mean time to stop contractions and the average time taken to delivery.

Keywords: Pre-term labour, Glyceryl trinitrate, Ritodrine, Efficacy

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INTRODUCTION

Preterm birth is defined as the delivery of the fetus before the 37th week of gestation and is considered as the single independent risk factor to impact the maternal or fetal adverse outcomes. The incidence rate of pre-term labour in the general population is 6 to 15% of the cases and around 3/4th deaths at the perinatal period in the underdeveloped countries and 5 to 9% in the developed one.¹⁻²

The long-term effects include loss vision, hearing, cerebral palsy, lung injuries and development disorders. The diagnosis of pre-term labour is made on clinical basis. This included the regular rhythmic contractions of the uterus starting every 10 minutes and the dilatation of cervix up to one or two centimetres and lesser degree of effacement. The basic underlying treatment depends upon the basic mechanism of tocolysis to stop uterine contractions. The most commonly used drugs are beta-adrenergic agonists, Ritodrine hydrochloride, nitrates, calcium channel blockers etc. with different degree of efficacy and side effect profiles.³⁻⁴

Ritodrine hydrochloride, was the first ever drug that was Food and Drug Administration (FDA) approved as tocolytic agent and is β_2 adrenergic receptors stimulant while leads to uterine smooth muscle relaxation. This also leads to, α_1 , α_2 receptors stimulation leading to side effects of pulmonary edema, arrhythmia and myocardial ischemia.⁵

Nitrous Oxide (NO) is produced in the body by various cells and is a highly reactive decreased the intra-cellular ionized calcium level and lead to smooth muscle relaxation by increasing GMP. NO is produced by the glyceryl trinitrate (GTN) which is available in different formulations. The major side effects include headache, dizziness, flushing and tachycardia.⁶⁻⁷

OBJECTIVE

To compare the efficacies between glyceryl trinitrate and Ritodrine as a tocolytic agent in pre-term labour.

METHODOLOGY

Study Design: Randomized control trial

Settings: DHQ Hospital, Faisalabad-Pakistan

Duration: Six months from July 2017 to December 2017.

Sample Technique: Non-probability consecutive sampling

Methods: In this study the cases of age 20 to 40 years undergoing pre-term labour with gestational age of 24 or more weeks were included. The diagnosis of pre-term labour was made on the basis on clinical examination of regular rhythmic contraction at one/ every 10 minutes and dilation of cervix less than 3 cm. The cases with allergic to any of the drug and those that were in active labour were excluded. The cases were divided into two groups i.e. A and B on the basis of simple lottery method. The cases in group A were treated with transdermal patch of glyceryl trinitrate (10 mg), which is replaced every 24 hours just below the umbilicus and those in group B were treated

with Ritodrine infusion at a dose of 0.05 mg/min for 24 hours and then tablet Ritodrine of 10 mg every 4 hour. The efficacy was labelled as yes where rhythmic these contractions stop for 12 hours.

Statistical Analysis: The data was entered and analysed by using Statistical package for social sciences (SPSS) version 23. Both the groups were compared by using chi square test for categorical data and independent sample t test for numerical data taking p value less than 0.05 as significant.

RESULTS

In this study there were total 100 cases, 50 in each group. There was no significant difference in terms of mean age 31.23 ± 7.11 vs 30.12 ± 6.47 years in group A and B with $p = 0.45$. table 1

Table 1: Study demographics

Variable	Group A	Group B	p value
Age (years)	31.23 ± 7.11	30.12 ± 6.47	0.45
Weight (kg)	53.11 ± 8.23	54.19 ± 10.78	0.67
Gestational age at presentation	27.33 ± 4.34	26.89 ± 3.98	0.76

There were 16 (32%) cases in group A and 18 (36%) in B with history of C section with $p = 0.88$. Table 2

Table 2: Study variables

Variables	Treatment group		Significance
	Group A	Group B	
Previous C section	16 (32%)	18 (36%)	0.88
Previous Abortion	5 (10%)	4 (8%)	0.77

The efficacy was seen in 44 (88%) of cases in group A as compared to 36 (72%) of cases in group B with $p = 0.03$ as in figure 1.

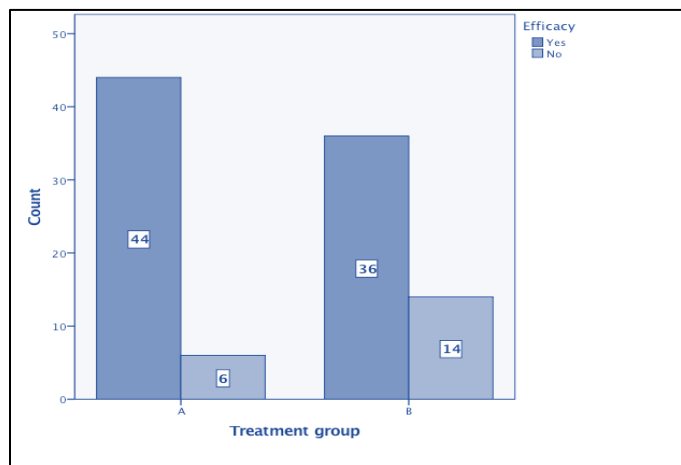


Figure 1: Comparison between the efficacies of two groups

The mean time taken to stop contractions was 4.33 ± 2.56 vs 7.02 ± 3.39 in group A and B respectively with $p = 0.001$. Table 3

Table 3: Comparison between the time and efficacy parameters

	Treatment group		Significance
	Group A	Group B	
Time to efficacy (hrs)	4.33 ± 2.56	7.02 ± 3.39	0.001
Time prolonged till delivery (days)	14.78 ± 5.14	8.67 ± 2.13	0.01

DISCUSSION

Pre-mature labour is an obstetrical emergency and need urgent treatment. Tocolysis is the modality used to stop and decrease the ongoing contractions in the uterus and gaining time for the fetal maturity to develop and decrease the morbidity and mortality risk in both fetus and the mother. It should be discouraged if the labour in process as it leads to increased likelihood of infection and uterine rupture.

The efficacy was seen in 44 (88%) of cases treated with GTN as compared to 36 (72%) of cases in group B treated with Ritodrine with a significant difference of $p = 0.03$.

This was close the findings of the study done by Jain C *et al* where they observed the similar efficacy with GTN group where it was seen in 88% of the cases, while in cases with Ritodrine this was seen in 76% of the cases with $p = 0.23$.⁸

This was in contrast to the study done by Lees *et al*, where they compared the similar drugs and the opposite was seen; although this difference was statistically not significant. The efficacy in their study with Ritodrine was 90% as compared to 84% with Glyceryl trinitrate.

Furthermore, the mean time for prolongation of the time to delivery was 14.78 ± 5.14 vs 8.67 ± 2.13 days in GTN vs Ritodrine in the present study. While in that of Lees *et al*, 35.8 days' vs 36.9 days.⁹

In another study done by Mohie-Eldin *et al*, they compared Ritodrine and Progesterone and it was seen that the efficacy was significantly better in cases with Ritodrine with p values of < 0.05 .¹⁰

While in another study by Ghomian N *et al*, GTN was compared with oral Nifedipine and in their group GTN was not only found significantly better in terms of efficacy but also in terms of mean time to delivery with $p < 0.05$.¹¹

There were no serious side effects noted in this study and the most reported side effects were mild cutaneous reaction and headache and was noted with GTN Patch in the present study. Dollery C *et al*, found the headache and giddiness as the most common side effect and was seen 3.12% of the cases with GTN.¹²

CONCLUSION




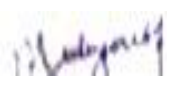

Glyceryl trinitrate is significantly better than Ritodrine in stopping pre-mature labour and this difference is significantly better both

in mean time to stop contractions and the average time taken to delivery.

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