

COMPARISON OF NITROGLYCERINE PATCH AND NIFEDIPINE IN TREATMENT OF PRETERM LABOUR

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ABSTRACT

Background: Preterm labour and resulting preterm birth of baby is challenge for gynaecologists. **Objective:** To compare the efficacy of transdermal nitroglycerine with oral nifedipine in inhibition of preterm labour. **Methodology:** This experimental study was conducted in the department of Obstetrics and Gynaecology in Sheikh Zayed Medical College/Hospital, Rahim Yar Khan. This study enrolled 60 women with preterm labour, first 30 patients received oral Nifedipine and next 30 patients used transdermal nitroglycerine (NTG) patch. The data was entered and analyzed by using SPSS version 16. **Results:** Mean prolongation of pregnancy was more with nitro glycerine (30.13±3 days) compared to Nifedipine (29.57±6days). Nifedipine was more successful in prolonging pregnancy beyond 48 hours. Failure of acute tocolysis defined as delivery within 48 hours, was more common with NTG (33.3%) as compared to Nifedipine (23.3%). Headache was higher in nitroglycerine group (3.3%) compared to Nifedipine group (0%). The neonatal outcomes in terms of respiratory distress was higher in Nifedipine (76.7%) than Nitroglycerine group (63.3%). There was no statistically significant difference between two groups. **Conclusion:** Nitroglycerine patch is as effective as Nifedipine in suppression of preterm labour and in prolonging pregnancy.

Key Word: Nitroglycerine Patch, Nifedipine, Preterm labour.

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INTRODUCTION

Preterm labour and preterm births one for the most challenging problem of obstetrician because most common cause of perinatal mortality is preterm birth.¹ The rate of preterm birth is increasing across low and middle income countries. Studies indicate that a high proportion of infants born very preterm suffer from a high risk of neuropsychological impairment, school problems and behavioural abnormalities.^{2,3} As the etiology is multifactorial and mainly unknown, preventive measures are also of limited value. The tocolysis used to prevent preterm labour basically aims prolonging pregnancy at least 48 -72 hours and so to provide adequate time to administer 2 doses of corticosteroids which would help in preventing respiratory distress syndrome in newborn.⁴ Variety of tocolytic drugs; isoxsuprine, ritodrine and nifedipine, with different pharmacological action have been used to suppress preterm labour. The Ca channel blockers have occupied the first choice as tocolytic therapy.⁵ Nitroglycerine is a drug with high pass inactivation in liver by Glutathione dependent organic nitrate reductase, to avoid its transdermal use of drug is beneficial.⁶ This study was carried out to compare the efficacy of transdermal Nitroglycerine with oral Nifedipine in inhibition of preterm labour.

METHODOLOGY

This randomized experimental study was carried out at the Gynaecology and Obstetrics department of Sheikh Zayed Medical College/Hospital, Rahim Yar Khan, during period from 1st January to 30th June 2014. This study included 60 women in preterm labour between 28 and 34 wks of gestation, randomly divided into two groups.

Group A: It included 30 patient receiving oral Nifedipine, they were administered 10mg Nifedipine capsule orally every 15 minutes up to 40mg in the first hour and were subsequently given 20mg Nifedipine slow release.

Group B: It included 30 patients receiving transdermal nitroglycerine 10mg/day.

Inclusion criteria: Patients in preterm labour with a single gestation between 28th and 34th week determined by reliable history of regular cycles and or ultrasonography at 8 to 12 weeks and no contraindication for tocolysis were selected.

Exclusion criteria: Women with fetal malformation and medical or obstetrical diseases were excluded.

The baseline characteristics of the selected groups included maternal age, parity, blood pressure and pulse. Informed consent was obtained from each study participant. The variables analyzed were delay in delivery for 48 hours, 7days or more than 7days, side effect profile of drugs and neonatal respiratory distress.

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Data was described in terms of mean \pm standard deviation for numerical variables, and percentage for quantitative variables. Comparison of numerical variables between study groups was done using student t-test for independent samples, and for comparing categorical data chi square(x) test was performed. P value less than .05 was considered statistically significant. All statistical calculations were done using software SPSS 15.

RESULTS

In group A, 30 women who received oral Nifedipine for treatment of preterm labour, their mean age was (30 \pm 20) years, mean gestational age 214.4 \pm 2.2 days, mean parity 0.93 \pm 0.7 as well as 30 women who received transdermal nitroglycerine patch for prevention of preterm labour their mean age was 28 \pm 3 years, mean gestational age 204.3 \pm 3.days, mean parity 0.83 \pm 0.7 there was no statistically significant difference between both groups. (Table I) Mean prolongation of pregnancy duration was more with nitroglycerine 30.13 \pm 3 compared to that of Nifedipine 29.57 \pm 3 days. (Table I)

Table I : Characteristics of both groups.

Characteristics	Nifedipine Group	Nitroglycerine Group B	P Values
Maternal age	30.58 \pm 2.2	28.13 \pm 3.06	0.518
Gestational age (days)	214.4 \pm 2.2	204.3 \pm 3.1	0.925
Parity	0.93 \pm 7.4	0.83 \pm 0.747	0.604
Systolic. BP (Mean \pm SD)	109.6 \pm 9.6	107.3 \pm 13.3	0.441
Diastolic BP (Mean \pm SD)	70 \pm 7.4	67 \pm 7.2	0.224
Pulse (Mean \pm SD)	73.2 \pm 5.5	74.2 \pm 4.3	0.224
Temperature (Mean \pm SD)	37. \pm 0.03	37 \pm 0	0.321

Failure of acute tocolysis, defined as delivery within 48 hours, was more common with nitroglycerine (33.3%) as compared to Nifedipine (23.3%). Headache was higher in the nitroglycerine group (3.3%) compared to Nifedipine group (0%).

The neonatal outcomes in term of respiratory distress was higher in Nifedipine (76.7%) than nitroglycerine group (63.3%). There was no statistically significant difference between both groups.

Table II: Maternal and Neonatal outcome

Variables	Nifedipine (n 30) Group A	Nitroglycerine (n 30) Group B	P. value
Delivery timing			
Within 48 hours	23.3%	33.3%	0.567
Within 7 days	13.3%	0%	0.112
Mean prolongation of gestational age	29.57 \pm 3.6	30.13 \pm 3.06	0.518
Discontinuation of drug due to side effect	0%	3.3%	0.317
Neonatal respiratory distress	76.7%	63.3%	0.385

DISCUSSION

There are studies which described the role of tocolytics drugs in eliminating the incidence of preterm labour, but only few studies compared drugs of same groups. Several agents have been used for inhibition of uterine contractility, but it remains unclear what would be the first line tocolytic agent.^{7,8,9,10} Conde Aquedelo et al, found that Nifedipine, a calcium channel blocker, could be used as first line tocolytic agent.⁹ A review regarding calcium channel blockers concluded that Nifedipine reduces the risk of delivery within 7 days of initiation of treatment and delivery before 34 weeks of gestation with relative improvements in neonatal outcomes.¹¹ A recent review also concluded that Nifedipine is better than no tocolysis in postponing of preterm birth for 24 hours in comparison with betamimetics and oxytocin receptor antagonists.¹² As for nitroglycerine (NTG), lees et al,¹² found that NTG prolonged gestation beyond 2 days in 84% patients compared with 88% in the ritodrine group. Wani et al,¹³ found the prolongation beyond 2 days to be 91% with nitroglycerine (NTG) versus 88% in ritodrine group. However in the RNOTT multicentric trial,¹⁴ nitroglycerine(NTG) showed a lower (63%) efficacy in prolonging labour beyond 48 hours against 71% with ritodrine.

A direct comparison of nitroglycerine (NTG) with Nifedipine by Amorim et al, showed that rate of preterm delivery within 48 hours after start of tocolysis was 15.4% in tocolysis with nitroglycerine (NTG) versus 12.5% in Nifedipine group.¹⁵ Dhawle et al,¹⁶ concluded that Nifedipine was significantly better than NTG in pregnancy prolongation beyond 48 hrs (88.4% women in Nifedipine group versus 68.3% in the NTG group).The mean prolongation was 29.04 days in the nitroglycerine (NTG) group against 34.46 days in the Nifedipine group lees et al¹²

who reported 35.8 days with NTG versus 36.9 days with ritodrine.

Our study demonstrates that Nifedipine was more successful in prolonging pregnancy beyond 48hrs. Failure of acute tocolysis was more common with NTG (30.13 days) compared to that of Nifedipine (29.57) days. Lees et al,¹² compared the side effects of NTG and ritodrine, and found that only side effect with NTG was headache. Bistis et al,¹⁴ found similar results. Wani et al,¹³ observed the incidence of headache to be 25% and total incidence of side effect with NTG to be 30%. Kashanian et al,¹⁷ found that Nifedipine was associated with side effects in 40% of patients as compared to 17.5% with atosiban. They also found the incidence of hypotension with Nifedipine to be 27.7%. Dhawle et al,¹⁶ found a total incidence of side effect was 48.7% with NTG against 34.88% with Nifedipine. Headache was significantly more associated with NTG (41.5% versus 4.7%).

This is similar to our study that shows an incidence of headache 3.3% in the NTG group compared to 0% in the Nifedipine group. Dhawle et al,¹⁷ reported an incidence of respiratory distress 17.1% in the NTG group and 9.3% in the Nifedipine group and difference was not statistically significant. In our study, the incidence of respiratory distress was 76.7% in the Nifedipine group and 63.3% in NTG group and showed no statistical significant difference between both groups. In conclusion, the results of our study showed the superiority of NTG in the mean prolongation of pregnancy compared to that of Nifedipine but Nifedipine was more successful in prolonging pregnancy beyond 48 hours. Failure of acute tocolysis, defined as delivery within 48 hours, was more common with NTG as compared to Nifedipine. However headache was higher in NTG group compared to Nifedipine group. The neonatal outcomes in terms of respiratory distress was higher in Nifedipine than NTG group however none of these differences had any statistically significance.

CONCLUSION

Nitroglycerine patch is as effective as Nifedipine in suppression of preterm labour and in prolonging pregnancy. However, studies with larger sample size are suggested.

Conflict of Interest

There is no conflict of interest among all authors.

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