

# Nifedipine versus Isoxsuprine for Suppression of Preterm Labour - A Comparative Randomised Study

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**Abstract:** ***Background:** Preterm labour is one of the major causes of infant morbidity and mortality. This study was undertaken to compare the efficacy of Nifedipine and Isoxsuprine for suppression of preterm labour. **Objectives:** To compare the efficacy of Nifedipine and Isoxsuprine with respect to 1) Days of gestation gained by tocolysis 2) Adverse effects 3) Neonatal outcome. **Method:** After fulfilling Inclusion & Exclusion criteria a total of 100 patients were included in the study. History regarding age, parity, obstetric history and Gynecological history, general physical and systemic examination was done. Patients were randomized into two groups and were either administered Nifedipine or Isoxsuprine. Statistical analysis was done using Chi-square test. **Results:** Tocolysis was successful in 45 (90%) of patients with Nifedipine compared to 34 (68%) in Isoxsuprine group (P= 0.0245). The prolongation of pregnancy up to 37 weeks was 23 (46%) and 13(26%) in Nifedipine and Isoxsuprine group respectively. 19 (38%) patients in Nifedipine group had side effects as compared to 42 (84%) in Isoxsuprine group. Neonatal outcomes were comparable in both the groups. **Interpretation & Conclusion - Nifedipine is cheaper and effective alternative and has fewer and less serious side effects compared to Isoxsuprine for suppression of preterm labour.***

**Keywords:** Preterm labour, Isoxsuprine, Nifedipine, Tocolysis, Pregnancy

## 1. Introduction

Preterm birth is one of the major causes of infant morbidity and mortality. The incidence of preterm labour is 5-10% which accounts for 70-80% of infant morbidity<sup>1</sup>. Despite of advances in perinatal medicine in recent decades, the problem of preterm delivery continues to frustrate satisfactory reproductive outcome. Neonatal intensive care is expensive and the survivors of extreme prematurity face considerable long term morbidity in later life. Therefore accurate prediction, prophylaxis and management of preterm labour have become a major goal in modern obstetrics.

Tocolysis means pharmacological inhibition of uterine contractions. The goal of tocolysis is to cause cessation of uterine contractions in patients with preterm labour. Conservative management of the patients with threatened preterm labour with tocolytics will reduce the neonatal morbidity, mortality and the cost of neonatal care.

Tocolytics are used

- To arrest the labour and prolong the pregnancy
- To gain sufficient time to enhance fetal lung maturation by concomitant use of corticosteroids
- To gain time for inutero transfer enabling the premature infant to be delivered in an obstetric unit experienced in care of high risk pregnancies and with supportive neonatal intensive care facilities.

Currently a variety of pharmacological agents are available to treat preterm labour. The incidence of troublesome side effects and the debatable efficacy of these agents prompt to search for the better drug. The drugs used should be

effective and should not result in maternal or fetal complications.

Nifedipine, a dihydropyridine calcium channel blocker, is an effective smooth muscle relaxant with low toxicity and no teratogenicity. It may represent an attractive therapeutic alternative due to its relaxing effects on myometrium.

Beta adrenergic agonist like isoxsuprine is also drug administered for tocolysis<sup>2</sup>, being effective orally and parentally. Meta-analysis has concluded that isoxsuprine has no significant beneficial effects on perinatal mortality, prolongation of pregnancy to term, neonatal morbidity, or birth weight. Therefore, the clinical efficacy of beta adrenergic agonists is doubtful. At the same time the use of these agents is associated with several side effects like palpitation, pulmonary oedema, myocardial ischemia, hypotension, fetal tachycardia and hypoglycemia.

This study was undertaken to compare the efficacy of Nifedipine, a calcium channel antagonist with Isoxsuprine (Beta sympathomimetic) in the treatment of preterm labour.

## 2. Review of Literature

- 1) First attempt at genuine tocolysis was done by Abramson and Reid in 1955 using Relaxin<sup>3</sup>
- 2) The first clinical trial using Nifedipine was done in the year 1980 in Europe (Ulmsten et al.)<sup>4</sup>. 10 patients with suspected preterm labour were given Nifedipine for 3 days till uterine contractions subsided. Labour was arrested in all the patients during the study period.

- 3) In 1961, first publication with Beta agonist Isoxsuprine was done by Bisop and WAutersz which was used to stop uterine contractions
- 4) The term tocolysis was coined by Mosler in 1964 at the symposium on physiology and pathology of uterine contraction
- 5) Ethanol was introduced as a tocolytic in 1967 by Fuchs but it has never gained clinical acceptance because of its significant maternal and fetal side effects.
- 6) In 1959 tocolytic properties of magnesium sulphate were initially described by Hall et al. In 1987 randomised comparison of magnesium sulphate with Ritodrine was done by Hollander et al showing similar efficacy. In 1990 Cox Et al questioned the efficacy of MgSo4. Recent results of MAGPIE trial suggest that it will disappear for the treatment of preterm labour.
- 7) In 1979 first prospective double blind trial of Ritodrine was conducted and is the only drug approved by FDA in 1980.
- 8) First study with Nifedipine was conducted by Ulmsten et al in 1980 which showed similar efficacy with Ritodrine<sup>5</sup>. Since then several studies on calcium channel blockers have been published. Nifedipine has been shown to inhibit contractions.
- 9) Read M.D<sup>7</sup> (1986) compared Nifedipine to Ritodrine in 40 cases with singleton pregnancy between 20-35 weeks. 20 cases allocated to each group. Nifedipine was considered to be more successful in halting labour than either Ritodrine or no treatment. Nifedipine did not show sustained tachycardia in mother.
- 10) James E. Fugerson et al<sup>9</sup> (1990) in their prospective randomized controlled trial studied 66 patient in preterm labour between 20-36 weeks to evaluate the efficacy and maternal, fetal and neonatal outcome associated with tocolysis with Nifedipine or Ritodrine. Delivery was delayed for 48 hours, 7 days and until 36 weeks of gestation in 81%, 70% and 4% respectively in Nifedipine group, compared with 72%, 63%, and 52% of patient in Ritodrine group. Maternal S/E were more common in patient who received Ritodrine compared to Nifedipine (18 of 38 Vs 5 of 38, p< 0.01). The study concluded that Nifedipine has less maternal side effects when compared to Ritodrine, however fetal and neonatal outcome appeared to be similar in both the group.
- 11) Mayur et al<sup>10</sup> (1990) compared tocolytic efficacy of Nifedipine with Ritodrine. 52 patients were selected randomly to received either oral nifedipine or I.V. Ritodrine. In comparison with Ritodrine, nifedipine has similar tocolytic efficacy with fewer adverse maternal and fetal side effects. Doppler studies showed insignificant effect on umbilical blood flow in Nifedipine group. Preliminary data suggests that Nifedipine is safe, effective and well tolerated tocolytic agent. It may prove to be a suitable alternative to Ritodrine especially for women in whom Beta mimetics are contraindicated.
- 12) M. Kupfermanc et al.<sup>11</sup> (1992) conducted a randomized prospective trial involving 71 women including 11 twin pregnancy, who had uterine contraction and observed cervical changes. The main outcome measure were prolongation of pregnancy for 48 hours, seven days and until 36 weeks, maternal side effects and hemodynamic changes as well as neonatal outcome were compared, delivery was delayed for 48 hours, 7 days, 36 weeks of GA in 83%, 67%, and 50% respectively in with nifedipine compared with 77%, 63%, and 43% respectively in patients with ritodrine group (no significant difference). Maternal side effects were less common in nifedipine group (27%) than in ritodrine group (77%), while neonatal outcome were similar in two groups. The fall in mean arterial pressure, diastolic pressure and heart rate were significantly greater in women who received ritodrine compared with those treated with nifedipine.
- 13) In study of Nefidipine and Isoxsurpine by Arati Gulati et al<sup>12</sup> (1993), 50 cases were included (25 cases to each group) between gestational ages 20-35 weeks. The success rate was 80% with nifedipine and 52% with isoxsuprine. Mean gestational age at delivery was 34 weeks and 33 weeks with Nifedipine and isoxsuprine group respectively. The mean prologation of pregnancy was 22 days and 13 days with Nifedipine and Isoxsurpine respectively, which achieved statistical significance.
- 14) D Kalita et al.<sup>13</sup> (1995) compared Nifedipine and Isoxsuprine in management of preterm labour between 28 and 36 weeks. 25 patients in each group received sublingual Nifedipine and I.V. Isoxsuprine. After the labour was arrested the patients in Nefidipine group were treated with oral Nifedipine for 3 days and those in Isoxsuprine group were treated with oral isoxsuprine for 3 weeks. They observed that the mean duration of prolongation of pregnancy was 31.68 + 102 days with Nifedipine and 23.08+ 9.3 days with Isoxsuprine. Maternal side effects were more common in Isoxsuprine group. Nifedipine is significantly better tolerated tocolytic agent than Isoxsuprine.
- 15) D.N.M. papatsonis et al<sup>14</sup>. (1997) conducted a randomised prospective study involving 185 singleton pregnancies. These women were randomized either to Nifedipine (n=95) or Ritodrine I.V (n=90). The outcome assessed was delay in delivery. It was concluded from the study that Nifedipine in comparison with Ritodrine in management of preterm labour is significantly associated with longer postponement of delivery, fewer maternal side effects and fewer maternal side effects and fewer admission to NICU.
- 16) Carolien A M Koks (1998) conducted a non blind randomized trial with 102 pregnant women with gestational age less than 34 weeks including 24 twin pregnancies. 55 patients were randomized to Nifedipine group and 47 to Ritodrine group. The conclusion of the study was that Nifedipine seems to be as effective as Ritodrine in treatment of preterm labour and is associated with less frequent side effects<sup>15</sup>.
- 17) Carr et al.<sup>16</sup> (1999) randomized 74 women with diagnosis of preterm labour between 24 and 33 weeks of gestational age, to receive either maintenance tocolytic therapy with oral Nifedipine, 20mg 4-6 hrs (N=37) or no treatment (controls 37) after their discontinuation with MgSO4 tocolysis. The gestational age at birth was 35.4 ± 3.2 weeks with Nifedipine and 35.3 ± 3.2 weeks with control, (p=0.9). The time gained during pregnancy was 37 ± 23.9 days with Nifedipine and 32.8 ± 20.4 days in control group, (p=0.4). The

authors concluded that maintenance therapy with oral Nifedipine does not significantly prolong pregnancy in women initially treated with MgSO<sub>4</sub>.

- 18) S Chhabra and Namrata Patil<sup>18</sup> (2001) conducted double blind study of efficacy of Isoxsuprine and Ritodrine to arrest preterm labour. 23 women were studied in each group, labour could not be arrested and preterm delivery occurred within 48 hours in 44% in Ritodrine group and 24% in Isoxsuprine group which was statistically significant. However in 12% women who received Ritodrine, pregnancy could be prolonged to term compared to 4% in Isoxsuprine group. Side effects were comparable in both the groups.
- 19) Raya Majhi R, Pratap K<sup>19</sup>, (2003) performed a comparative study between Nifedipine and Isoxsuprine in suppression of preterm labour. It was prospective randomized design to compare efficacy and safety of calcium antagonist Nifedipine with Betamimetic Isoxsuprine. 81.25% patients receiving Nifedipine and 70% receiving Isoxsuprine achieved successful tocolysis. The mean prolongation of pregnancy with Nifedipine was 25 week's  $\pm$  19.85 days and that with Isoxsuprine 19.18 week's  $\pm$  17.82 days. The study concluded that Nifedipine is a safe and effective alternative to Isoxsuprine in suppressing preterm labour.
- 20) Vicenc Cararach et al.<sup>22</sup> (2006) randomized 80 patient with singleton pregnancy admitted for threatened preterm labour with intact membranes between 22-35 weeks. The main objective of the study was to compare the efficacy of Nifedipine and Ritodrine in prolonging pregnancy beyond 48 hours, 1 week and 36 weeks and to evaluate maternal side effects and adverse perinatal outcome. 40 women in each group received either oral Nifedipine or I.V Ritodrine. The percentage of initial response, the speed of onset of action and the rate of successful treatment within 48 hours were significantly better in Ritodrine group. However, prolongation of pregnancy beyond 7 days and 36 weeks of pregnancy was similar with significantly lower side effects in Nifedipine group.
- 21) Vijay Roy, G S Prasad and K Lata<sup>23</sup> (2006) studied tocolysis with Ritodrine, in preterm labour. 25 patients were randomized to each Ritodrine and Isoxsuprine group. It was concluded that Ritodrine was more efficacious in delaying delivery and fetal maturity as compared to Isoxsuprine.
- 22) Maitra Nandita et al.<sup>24</sup> (2007) evaluated and compared the side effects and tolerability, tocolytic efficacy of Ritodrine and Nifedipine between 20 and 36 weeks of gestation and concluded that Nifedipine was more successful in arresting preterm labour, with less side effects and better tolerability.

### 3. Methods and Materials

Nifedipine Versus Isoxsuprine for suppression of preterm labour – a comparative Randomised study will be undertaken in the Department of Obstetrics Gynaecology of Sir T hospital and government Medical College Bhavnagar, Gujrat during the period June 2013 to June 2015. All the cases with inclusion and exclusion criteria will be selected during the study period. They will be randomized in to two

groups using simple randomization technique. A total of 100 cases were included in the study.

#### Inclusion criteria

- Singleton pregnancy.
- Gestational age between 28-36 weeks.
- Uterine contractions four in 20 min or eight in 60 min lasting for 30 seconds or more. Cervical dilatation 1 to 3 cms.
- Cervical effacement 80% or greater. Intact membranes.

#### Exclusion criteria

- Serious maternal illness
- Cardiovascular diseases
- Diabetes mellitus
- Bronchial asthma
- Pregnancy induced hypertension
- Severe anaemia
- Advanced labour
- Suspected chorio-amnionitis
- Antepartum haemorrhage
- Congenital anomalies
- Multiple pregnancy and polyhydromnios

Complete history was taken regarding age, occupation, socioeconomic status, and any history of infections, obstetric history, and history of previous preterm deliveries, abortions, history of diabetes mellitus, heart disease, chronic renal failure, hypertension, and asthma.

Period of gestation was calculated from Naegeles rule in patients with known last menstrual period, otherwise assessed by clinical examination and ultrasound. Patient's general physical examination was done. Vitals were recorded. Cardiovascular system and respiratory system examined.

Abdominal examination- uterine heights, presentation, position, lie of the fetus, liquor volume, fetal heart rate were recorded. Uterine contractions were evaluated with respect to frequency and duration.

Per speculum examination- speculum was introduced into the vagina and high vaginal swab was taken for culture and sensitivity. Any discharge /leak /bleed noted. Presence or absence of herniation of membranes noted.

Per vaginal examination – the consistency, position, effacement, dilatation of cervix, status of membranes, and station of presenting part noted.

Routine investigations like Hb%, total count, differential count, E.S.R, Urine for albumin, sugar and microscopy, blood grouping & Rh typing, HIV, HBsAg, ultrasound examination, non stress test, cervical swab or high vaginal swab for culture and sensitivity, urine for culture and sensitivity were sent after satisfying the above mentioned criteria and after excluding the contraindications

For tocolysis patients were included in the study. Written and informed consent was taken from the participants. Group - A 50 patients received Nifedipine:

Loading dose –20 to 30mg per oral, if contractions persist 20 mg per oral after 1½ hour interval continued till total dose of 160mg reached till uterine contraction subside. Maintenance dose of 10 mg 6 hourly is used till 36 weeks.

Group- B 50 patients received Injectable and oral Isoxsuprine. Isoxsuprine is given initially with injectable isoxsuprine 10mg 8 hourly for 48 hours. If uterine contractions subside after 48 hours then maintenance dose with oral isoxsuprine 10 mg till 36 weeks of gestation.

All the patients received Injection Betnesol 12 mg 2 doses 24 hours apart. Oral Amoxicillin 500mg T.I.D for 5 days and Metronidazole 400mg B.D was given for 5 days.

After delivery placenta was examined and the neonate was evaluated for gestational age, birth weight, congenital anomalies, APGAR score at 1 and 5 minutes. The babies were shifted to NICU if needed. These babies were followed up for perinatal complications during the hospital stay.

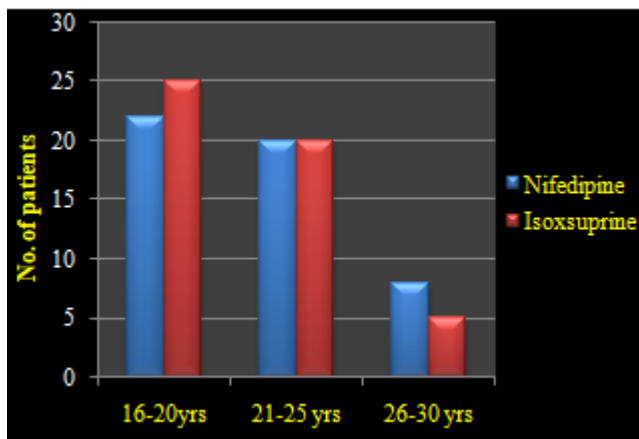
Statistical analysis of 100 cases was done using Chi- Square test and Epi-Info software was used for statistical calculations.

**4. Results**

The observations made in this present study are as follows:

**Table 1: Age group distribution**

Age group	Nifedipine (50)	Isoxsuprine(50)
16-20 yrs	22 (45%)	25 (50%)
21-25 yrs	20 (40%)	20 (40%)
26-30 yrs	08 (15%)	05 (10%)

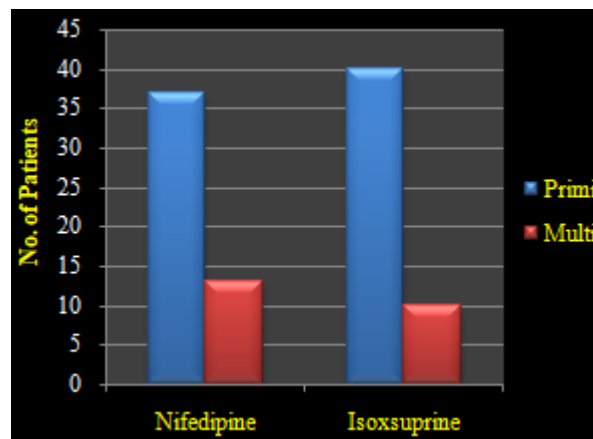


**Graph 1: Age group distribution**

Majority of cases were between 16 and 25 years. 85% in Nifedipine group and 90% in Isoxsuprine group. Mean age was 22 years in both the groups. There was no significant differences between the two groups as p value was 0.6428, Chi-Square value = 0.8838 and d f (degree of freedom) = 2. It is clear from the graph that majority of the preterm labour were seen in young age group between 16 and 20 years.

**Table 2: Distribution parity wise**

Gravida	Nifedipine (50)	Isoxsuprine(50)
Primi	37 (75%)	40 (80%)
Multi	13 (25%)	10 (20%)



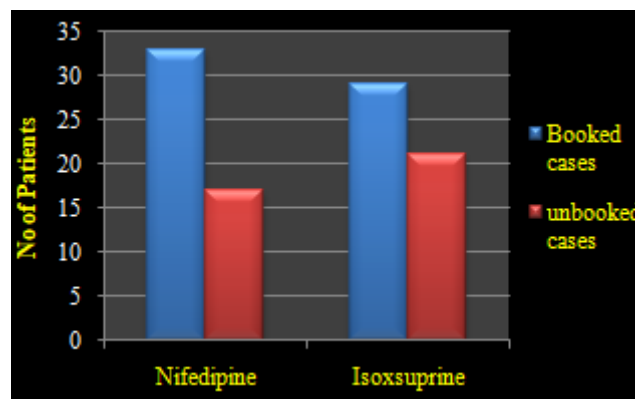
**Graph 2: Parity wise distribution**

Primigravida were in majority in both the groups. 75% of patients were seen in Nifedipine group and 80% in Isoxsuprine group. But there was no significant differences seen. P value was 0.6341, Chi-Square test =0.2251 and d f = 1. The graphical representation of the parity based distribution is shown.

It is clear from Graph 2 that the number of preterm labour was seen more in primigravida patients.

**Table 3: Distribution of booked and unbooked cases**

	Nifedipine (50)	Isoxsuprine(50)
Booked cases	33 (66%)	29 (58.%)
Unbooked cases	17 (34%)	21 (42%)

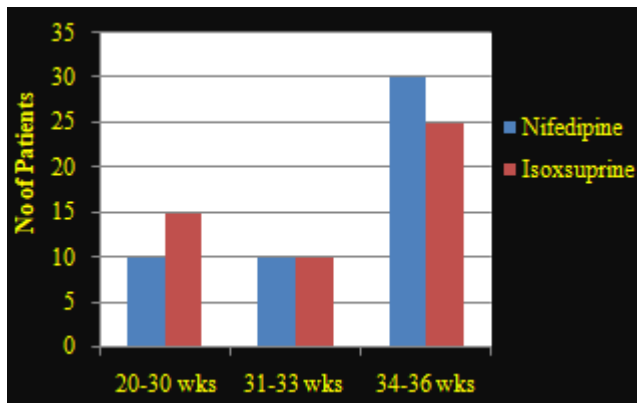


**Graph 3: Distribution of booked and unbooked cases**

The incidence of preterm labour was more in booked cases. 66.6% and 58.3% in Nifedipine and Isoxsuprine group respectively. There was no significant differences between the two groups of subjects, p value = 0.5365, Chi-Square = 0.3820 and df =1.

**Table 4: Distribution based on gestational age at tocolysis**

Gestational age (weeks)	Nifedipine (n=50)	Isoxsuprine (n=50)
28-30weeks	10 (20%)	15 (30%)
31-33 weeks	10 (20%)	10 (20%)
34-36 weeks	30 (60%)	25 (50%)

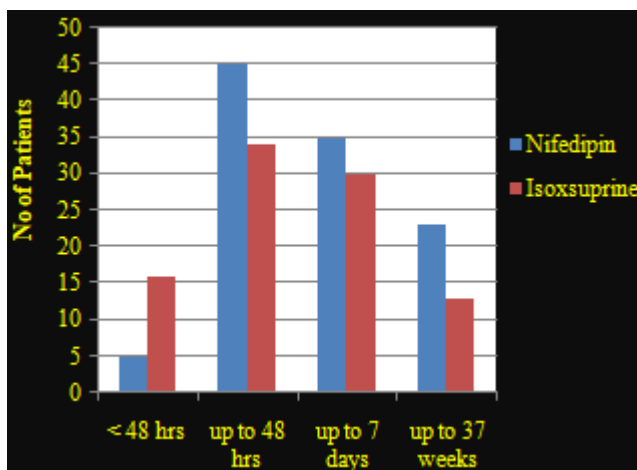


Graph 4: Distribution based on gestational age at tocolysis

More number of patients was between gestational age of 34 and 36 weeks being 60 per cent in Nifedipine group and 50 per cent in Isoxsuprine group. The p value was 0.2655, which is not significant, Chi-Square test = 2.652 and d f = 2. The mean gestational age at tocolysis was 33 weeks in both the groups.

Table 5: Mean prolongation of pregnancy

No of days	Nifedipine (n=50)	Isoxsuprin (n=50)
< 48 Hours	05 (10%)	16 (32%)
Up to 48 Hours	45 (90%)	34 (68.%)
Up to 7 Days	35 (70%)	30 (60%)
Up to 37 Weeks	23 (46%)	13 (26%)

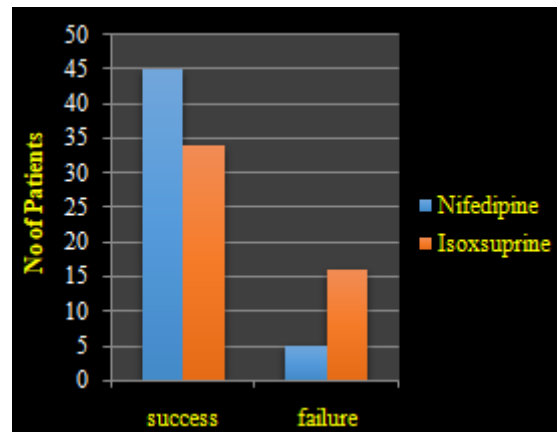


Graph 5: Mean prolongation of pregnancy

The prolongation of pregnancy was up to 48 hours seen more in Nifedipine group with significant differences when compared with Isoxsuprine group. The p value was 0.0245, Chi-Square = 9.389 and d f = 3. This shows that Nifedipine was more successful in delaying delivery for 48 hours which would enhance fetal maturity by concomitant use of corticosteroids. The prolongation of pregnancy up to 7 days was comparable in both the groups. Prolongation of pregnancy till 37 weeks was seen in 46.6 percentages of patients in Nifedipine group and 26.6 percentages in Isoxsuprine group which is significant. Graph 5 shows the significant differences between the two groups.

Table 6: Pregnancy outcomes in treatment groups

	Success n (%)	Failure n (%)
Nifedipine	45 (90%)	05 (10%)
Isoxsuprine	34 (68%)	16 (32%)



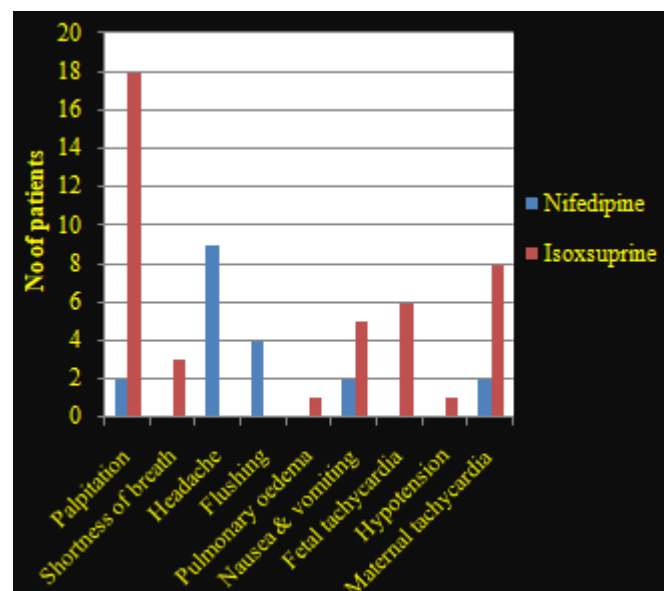
Graph 6: Pregnancy outcomes

The survival analysis shows that at 48 hrs, which is relevant because it permits use of steroids to promote fetal lung maturation, 90% of nifedipine patients remained undelivered compared to 68.3% in Isoxsuprine group.

The success and failures between the two groups was significant with p value at 0.0140, Chi-Square = 6.0277 and d f = 1.

Table 7: Comparison of side effects

Side effects	Nifedipine (n=50)	Isoxsuprine (n=50)
Palpitation	2(4%)	18(36%)
Shortness of breath	-	3(6%)
Headache	9 (18%)	-
Flushing	4 (8%)	-
Pulmonary oedema	-	1 (2%)
Nausea & vomiting	2 (4%)	5 (10%)
Fetal tachycardia	-	6 (12%)
Hypotension	-	1(2%)
Maternal tachycardia	2(4%)	8(16%)



Graph 7: Comparison of side effects

The side effects noted in Nifedipine group was predominantly headache (18%) followed by hot flushes (8%) as clearly represented by the Graph 7. These complications were not seen in patients who received Isoxsuprine. Palpitation and maternal tachycardia were significant side effects seen in patients who received

Isoxsuprine. In nifedipine group 38 percent (19 patients) had side effects as compared to 84 percent (42 patients) in Isoxsuprine group had side effects.

The side effects were more frequent and were more troublesome with Isoxsuprine when compared to Nifedipine. In one patient in Isoxsuprine group pulmonary oedema was diagnosed and these patients were treated with, stopping the drug, oxygen and diuretics. Nausea and vomiting were successfully treated with antacids and antiemetics.

In nifedipine group there was decrease in systolic blood pressure that was lower than base line after administration of second dose. The fall in the blood pressure was 10 – 20mm of Hg seen in 15 patients. The fall in the diastolic blood pressure was 10mm Hg which was seen in 20 patients of Nifedipine group after the administration of second dose of the drug. This decrease in the blood pressure in the Nifedipine group did not necessitate any treatment. Other side effects were headache, seen in 9 patients and flushing, seen in 4 patients. These side effects subsided after few hours and did not necessitate any special measures.

**Table 8:** Side effects

Drugs	Side effects	No side effects
Nifedipine	19 (38%)	31(62%)
Isoxsuprine	42 (84%)	08(16%)

Isoxsuprine is associated with significantly more side effects than Nifedipine since the calculated p value is less than 0.0001, Chi-square value is 20.341 and  $df = 1$  which show highly significant differences.

**Table 9:** Neonatal outcomes

Parameters	Nifedipine (n=50)	Isoxsuprine (n=50)
Gestational age at birth (weeks)	36 weeks 1 days	35 weeks
Birth weight (grams)	2288	1938
NICU admission	26 (52%)	31 (62%)
Perinatal death	5(10%)	7 (14%)
Respiratory distress syndrome	6(12%)	8 (16%)

The mean gestational age was not significantly different, Nifedipine group was 35 weeks 3 days weeks and in Isoxsuprine was 34 weeks. The mean birth weight in Nifedipine group was 2050 grams and in Isoxsuprine group was 1900 grams.

Number of admissions to NICU was 5% and 65% in Nifedipine group and Isoxsuprine group respectively. Perinatal deaths were more in Isoxsuprine group 9 (15%) as compared to Nifedipine group which was 6 (10%). Respiratory distress syndrome was % in Nifedipine group and 16.6% % in Isoxsuprine group. The causes of perinatal deaths were respiratory distress syndrome, septicaemia, intraventricular haemorrhage. Neonatal outcomes were comparable in both the groups.

## 5. Discussion

This prospective study was designed to find out the safety, efficacy and perinatal outcome of Isoxsuprine and

Nifedipine in women with preterm labour. Patients were included into the study group in which uterine contractions continued even after complete bed rest. This could reduce the number of patients in false labour being included in the study.

Since the late 1970's Nifedipine has been known to relax the pregnant and non pregnant uterus (Ulmsten, Anderson KE). The first study of Nifedipine in the management of preterm labour was reported by Ulmsten et al in 1980. In all patients studied, Nifedipine stopped uterine activity and delayed delivery. Ulmsten showed that Nifedipine was associated with postponement of delivery for more than 3 days in 80% of the study group.

Most of the studies so far conducted have compared the efficacy and safety between Nifedipine and Ritodrine. Only few studies have been done between Nifedipine and Isoxsuprine. Kedar M G et al, Kalita D et al and Rayamajhi R et al have conducted studies about comparison between the efficacy and safety of Nifedipine and Isoxsuprine in the suppression of preterm labour. Read MD et al and Murray C et al have studied only about Nifedipine as tocolytic agent in the suppression of preterm labour. Papatsonis et al have studied the comparison between Nifedipine and Ritodrine in the suppression of the preterm labor.

100 antenatal women with singleton pregnancies were enrolled in our study and they were randomly assigned into two groups- group A (Isoxsuprine) and group B (Nifedipine). The patients in both groups were well matched regarding age, antenatal care, gravidity, previous obstetric history and parity.

Mean maternal age in our study, in Nifedipine and Isoxsuprine group was 22yrs and 21yrs respectively. While in Kedar et al study it was 22±5.5yrs in Nifedipine group and 23.4±4.6yrs in Isoxsuprine group and Rayamajhi R et al study it was 26 yrs in Nifedipine group and 25.12 yrs in Isoxsuprine group.

Gestational age in weeks in the present study, in Nifedipine group was 33wks and 33wks in Isoxsuprine group. While in Kedar et al study it was 30.5 ± 3.5 wks in Nifedipine group and 31.4 ± 2.8 wks in Isoxsuprine group and Rayamajhi R et al study it was 32.22wks in Nifedipine group and 32.64 wks in Isoxsuprine group.

The mean prolongation of pregnancy in the present study was 22 days with Nifedipine and 16 days with Isoxsuprine. These results can be compared with Kedar et al reported mean prolongation of pregnancy as 22.4 ± 15.6 days with Nifedipine and 16.5 ± 14.5 days with Isoxsuprine. Rayamajhi et al reported mean prolongation of pregnancy as 25.71 days with Nifedipine and 19.18 days with Isoxsuprine. Tewari et al reported mean prolongation of pregnancy as 39.26 ± 25.5 days with Nifedipine and 25.5 ± 15.75 days with Isoxsuprine. In the present study, successful tocolysis was achieved in 90% with Nifedipine group and 68% with Isoxsuprine group. These results were similar to those reported by Kedar et al, 88% with Nifedipine and 76% with Isoxsuprine group. Rayamajhi et al reported 81.25%

successful tocolysis with Nifedipine and 70% with Isoxsuprine group.

The mean birth weight was slightly more in Nifedipine group (2288 gms vs 1938 gms) as compared to Isoxsuprine group in our study. These results were similar to those reported by Rayamajhi et al study, 2383 gms in Nifedipine and 1940gms in Isoxsuprine group. While perinatal mortality was more in isoxsuprine group compared to nifedipine group.

The maternal side effects observed in our study were less as compared to Kedar et al and Rayamajhi et al study. No significant change in BP was observed with Nifedipine group in our study that necessitated discontinuation of therapy, as Nifedipine exhibits greater selectivity for inhibition of uterine activity relative to cardiovascular effects. Clinical trials with Nifedipine have reported either an insignificant decrease in blood pressure or no change in maternal heart rate or transient hypotension, which resolves spontaneously in most patients without evidence of prolonged maternal and foetal symptoms. This in part may be attributed to the use of prehydration in the Nifedipine regime.

## 6. Conclusion

In this study it was found that oral Nifedipine has fewer and less serious side effects as compared to injectable and oral isoxsuprine. The Nifedipine drug was more successful in delaying the delivery for 48 hours which would enhance fetal lung maturity by use of corticosteroids. The mean prolongation of gestation was higher for Nifedipine when compared to Isoxsuprine. The neonatal outcome was comparable in both the groups.

Nifedipine has the ease of oral administration. Other advantages are lack (relative) of influence on maternal cardiac and carbohydrate metabolism in contrast with Isoxsuprine. In addition Nifedipine does not interfere with the interpretation of fetal heart rate tracings as does Isoxuprine.

Hence we conclude that oral Nifedipine is a cheaper and effective alternative and has fewer and less serious side effects when compared with Isoxsuprine for suppression of preterm labour.

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