

Comparative Study of Transdermal Nitroglycerin Patch versus Isoxsuprine Hydrochloride in Patients With Preterm Labour

Sanjaykumar Tambe¹, Yogita Alnure²

¹Professor, Department of Obstetrics & Gynaecology, B.J.Govt. Medical College, Pune, Maharashtra, India

²Resident, Department of Obstetrics & Gynaecology, B.J.Govt. Medical College, Pune, Maharashtra, India

Abstract: Preterm birth is the leading cause of perinatal & neonatal mortality so there is need to use tocolytics to reduce preterm births. **Methods:** A randomised prospective comparative study was carried out over 24 months period and 100 antenatal cases were included between 24 to 36 weeks of gestation. These cases were divided into two groups each containing 50 cases. Group 1: Treated with transdermal Nitroglycerin patch (Nitroderm 5mg) 12 hours followed by Tab. Nitroglycerin (nitrocontine) (2.6mg) BD orally for one week. Group 2: Treated with Inj. Isoxsuprine hydrochloride (Duvadilan) 10mg intramuscular 8 hourly followed by Tab. Isoxsuprine (duvadilan) 10mg every 8 hourly orally for one week. **Results:** There were no differences in mean prolongation of pregnancy, fetal side effects & mode of delivery but there were differences in maternal side effects, birth weight & neonatal outcome. Headache was present in 48% of NTG group. Tachycardia (84%) & palpitation (78%) was found in isoxsuprine group. Mean birth weight in NTG group was 2.45 Kg and in Isoxsuprine group 2.22 Kg. Apgar score <7 at 1 & 5 minute found in 6 neonates in NTG group as compared to 14 neonates in isoxsuprine group. **Conclusion:** Though both drugs NTG transdermal patch and Isoxsuprine hydrochloride are used for tocolysis, NTG transdermal patch appears to be safe, cost effective, noninvasive method to treat preterm labour. NTG patch is free of painful intramuscular injections and less of side-effects and better acceptability by patients.

Keywords: NTG, Isoxsuprine, preterm, tocolytic.

1. Introduction

Preterm birth is one of the biggest challenge for obstetricians and paediatricians. Preterm births continue to be the leading cause of perinatal and neonatal morbidity and mortality. It represents one of the principal targets for obstetric health care and challenging the obstetrician to tackle this problem.

About 70-80% of perinatal deaths occur in preterm infants.¹ Almost two third of deaths in preterm infants occurs in those born at less than 28 weeks of gestation.² Preterm birth after 32 weeks of gestation are known to have improved survival and less morbidity due to rapid advances in perinatal and neonatal medicine in recent decades.³

Due to improvement in neonatal intensive care facilities and obstetric interventions fetal survival is now possible even at 20 weeks of gestation in developed countries. However in even best setups in developing countries salvage is rare below 28 weeks of gestation.

Over the few years a variety of tocolytic drugs (Isoxsuprine, Ritodrine, Nifedipine, magnesium sulphate, prostaglandin synthase inhibitors, Oxytocin receptor antagonists) with different pharmacological action have been used to suppress preterm labor. With the use of these drugs considerable adverse maternal effects. (like pulmonary oedema, arrhythmia, myocardial ischemia) and fetal effects (like hyperglycemia, hypokalemia, neonatal hypoglycemia & paralytic ileus) were reported.²

Most of these drugs requires strict monitoring of both mother and fetus due to their side effects.⁴

Nitroglycerine is a drug with a high first pass inactivation in liver. The active substance is rapidly metabolized in the liver by a glutathione dependent organic nitrate reductase. To avoid it, transdermal use of the drug is beneficial.⁵ In transdermal drug administration the drug is delivered at a constant and predictable rate so a smooth plasma concentration of the drug is reached without fluctuations. Isoxsuprine is beta adrenergic agonist that causes direct relaxation of uterine and vascular smooth muscle. Its vasodilator actions are greater on arteries supplying skeletal muscle than on those supplying skin.

2. Material and Method

This is a randomised prospective comparative study, carried out in the department of obstetrics and Gynaecology of Government General Hospital over a period of 24 months.

Selection of patients-

During a study period 100 antenatal cases with 24-36 weeks of gestation randomly selected for study depending on inclusion and exclusion criteria. These 100 cases were divided in two groups each group containing 50 cases with nitroglycerin and isoxsuprine group.

Selection of Cases

A) Inclusion Criteria

- 1) All the patients between GA of 24-36 week with singleton pregnancies. primi gravida or multi gravida
- 2) Patients with intact membranes with singleton pregnancy.
- 3) Patients with Onset of labour between 24-36 weeks
- 4) Patients with Cervical dilatation < 3 cm

- 5) Patients with no obvious cause for onset of preterm labour (Polyhydramnios, Multiple gestation & RTA)
- 6) Patients with Hb ≥ 8 gm%
- 7) Patients with no medical illnesses (preeclampsia, diabetes, hypo/hyperthyroidism)

B) Exclusion Criteria

- 1) Gestation age > 36 weeks
- 2) Cervical dilatation > 3 cm
- 3) Medical illnesses — DM, hypothyroidism and heart diseases etc.(chronic hypertension).
- 4) PROM/Chorioamnionitis
- 5) Fetal distress
- 6) Severe IUGR
- 7) Lethal congenital anomaly
- 8) Intrauterine death
- 9) Sensitivity or contraindication to tocolysis will be excluded from this study

In Group-I 50 patients were applied transdermal nitroglycerine patch on anterior abdominal wall releasing nitroglycerine at the rate of 0.2mg/hour. This patch was applied only for 12hours on anterior abdominal wall to avoid its tolerance, followed by Tab Nitroglycerin (2.6mg) twice a day for one week.

In Group-II 50 patients were given inj. Isoxsuprine (duvadilan)-10mg intramuscularly every 8 hourly for 3 doses followed by tab Isoxsuprine (duvadilan)10 mg orally every 8 hourly for one week

Treatment was discontinued in both groups if there was, Maternal tachycardia (pulse rate > 120 /min)

Drop of blood pressure by 15mm of Hg or more from baseline diastolic pressure Signs and symptoms of pulmonary edema (breathlessness, cough with expectoration.)

Patients were discharged after 48 hours of uterine relaxation on Tab nitroglycerin 2.6mg BD for one week if NTG patch was applied or on tab. Isoxsuprine hydrochloride (duvadilan 10mg) TDS/BD for one week if Inj. Duvadilan was given. Then patients were followed up weekly on OPD basis.

Treatment was considered successful if tocolysis achieved for more than 48hours and uterine contraction stopped. Efficacy both drugs measured in terms of-

- Maternal side effects.
- Fetal side effects.
- Changes in cervical dilatation and cervical length.
- Prolongation of pregnancy
- Mode of delivery
- Neonatal outcome and birth weight.

3. Discussion

Preterm birth is one of the biggest challenge for obstetricians and pediatricians and continues to be the leading cause of perinatal and neonatal morbidity and mortality.

In our study the mean maternal age group in Nitroglycerin group is 23.32 ± 4.42 years which is comparable to the study conducted by Sachan Rekha (2012)⁶ where the mean maternal age group in Nitroglycerin group was 25.92 ± 3.98 years. Similarly in the studies conducted by Dhawle et al (2013)⁷ and A.Kokane (2015)⁸ the mean maternal age group in nitroglycerin group was 25.92 ± 3.866 years and 24.60 ± 5.693 years respectively.

Also in the studies conducted by Nisha Singh et al (2011)⁹ and Sachan Rekha (2012)⁶ the mean maternal age group in Isoxsuprine group was 25.6 years and 25.68 ± 3.84 years respectively, which is comparable to the mean maternal age group in Isoxsuprine group in our study 24.72 ± 4.18 years.

Mohammad et al¹⁰ in 2012 conducted a study in which 76.10% of the cases belonged to low socioeconomic status. In the present study 54% patients in Nitroglycerin group and 70% patients in Isoxsuprine group belonged to low socioeconomic status. We have observed that preterm labor is more common in lower socioeconomic group.

In the present study majority of the patients (48%) are Primigravida. Similarly, in the studies conducted by Sachan Rekha (2012)⁶ and A.Kokane (2015)⁸ 44% and 56% of the cases respectively were Primigravida.

The mean gestational age at admission in Nitroglycerin group & isoxsuprine group in the study conducted by A.Kokane (2015)⁸ was 32.53 ± 1.6391 and 32.09 ± 1.9696 respectively. This is comparable to our study where the mean gestational age at admission in nitroglycerin group & isoxsuprine group was 33.02 ± 1.86 and 32.96 ± 2.17 respectively.

In the study conducted by A.Kokane (2015)⁸ the mean cervical dilatation in nitroglycerin and isoxsuprine group is 0.14 ± 0.64 cm and 0.19 ± 0.89 cm respectively and the P value was 0.02481 which is statistically significant. However our study showed mean cervical dilatation in Nitroglycerin and isoxsuprine group is 0.07 ± 0.32 cm and 0.25 ± 0.59 cm respectively and P value was less than 0.062 which is statistically not significant because cervical dilatation was not more than 3cm in both the groups.

In the present study the mean gestational age at delivery in nitroglycerin and isoxsuprine group is 36.32 ± 2.07 & 35.52 ± 2.10 weeks respectively. A.Kokane (2015)⁸ found that significant number of pregnancies were prolonged beyond 36 weeks of gestational age with the use of nitroglycerin as compared to isoxsuprine. The mean gestational age at delivery in nitroglycerin and isoxsuprine group in his study was 36.16 ± 2.645 & 35.16 ± 2.93 weeks respectively. Also the mean gestational age at delivery in isoxsuprine group in the study conducted by Vijay Roy et al (2006)¹¹ was 35.5 ± 1.83 weeks. Thus our results were comparable.

In our study 96% & 94% patients delivered after 48 hours of application of transdermal nitroglycerin patch and isoxsuprine injection respectively. Our findings correlate to the studies conducted by Sachan Rekha et al (2012)⁶ (98% & 84%) & A. Kokane et al (2015)⁸ (98% & 96%). Similarly

studies conducted by Kumar Aruna (2001)¹² and Kunjan Shaha (2015)¹³ showed a success rate of 95% and 98% respectively after 48 hours of application of transdermal nitroglycerin patch.

The findings in our study related to prolongation and mean prolongation of pregnancy in nitroglycerin and isoxsuprine group is similar to the studies conducted by Sachan Rekha et al(2012)⁶, Kokane A. et al(2015)⁸,KunjanShaha et al(2015)¹³, He Q et al (2002)¹⁴, Smith et al (2010)¹⁵, Kalitha et al (1998)¹⁶, Rayamajhi et al(2003)¹⁷ and Seema et al (2012)¹⁸.

In our study mean duration of prolongation of pregnancy in Nitroglycerin group is 25.72 ± 19.63 days which is comparable to studies conducted by The He Q et al (2002)¹⁴, Smith et al (2010)¹⁵,Kokane et al(2015)⁸ where mean duration of prolongation of pregnancy was 25days,23days,24.32 \pm 19.61days respectively.

In our study mean duration of prolongation of pregnancy in Isoxsuprine group was 20.34 ± 17.53 days which is comparable to studies conducted by Kalitha et al (1998)¹⁶, Rayamajhi et al(2003)¹⁷ and Seema et al (2012)¹⁸,Kokane et al(2015)⁸ where mean duration of prolongation of pregnancy was 23.06 days, 29.18 days, 27.54 days, 20.52 \pm 17.56 days respectively.

Afifa Wahid (2007)¹⁹, Kokane A. (2015)⁸, K. Shaha (2015)¹³ and Vijay Roy et al (2006)¹¹ had found that majority of the patients in both the groups delivered vaginally. This is similar to the findings in our study where 80% in nitroglycerin group and 76% in isoxsuprine group of patients delivered by vaginal route.

In our study the mean birth weight in nitroglycerin group is 2.45 ± 0.423 kg which is comparable to the study conducted by Murray C(1992)²⁰ where the mean birth weight is 2.58 kg. Similarly in the studies conducted by Smith et al(1999)²¹ and A. Kokane (2015)⁸ the mean birth weight was 2.543 and 2.506 ± 0.42877 kgs respectively.

Also in the studies conducted by Kalitha et al(1998)¹⁶, Rayamajhi et al(2006)¹⁷, A. Kokane (2015)⁸ and Seema et al(2012)¹⁸ the mean birth weight in isoxsuprine group was 2.27, 2.383, 2.34 ± 0.44309 and 1.94 kgs respectively, which is comparable to the mean birth weight in isoxsuprine group in our study 2.22 ± 0.446 kgs

In the present study headache was the universal side effect among women in nitroglycerin group, observed in 48% of women. It was relieved by giving analgesic like tablet paracetamol. It was similar in studies conducted by Graeme Smith et al(2007)²², Kokane A. et al(2015)⁸ and Kunjan Shaha et al(2015)¹³.

Hypotension and local irritation was observed in 4% and 2% of women respectively in nitroglycerin group. It is similar to study conducted by Kokane A. et al(2015)⁸.

Tachycardia, palpitation and were seen in 84% and 78% of the women in Isoxsuprine group and our findings correlate with the studies conducted by Kokane et al(2015)⁸,

,Rayamajhi et al (2003)¹⁷. No other side effects were observed in both the groups.

Fetal tachycardia (FHR>160bpm) was observed in 5(10%) of patients in nitroglycerin group and 6(12%) of patients in Isoxsuprine group. Fetal bradycardia(FHR<110bpm) was observed in 2(4%) of patients in nitroglycerin group and 1(2%) in Isoxsuprine group.

Thus, the fetal side effects in our study are similar to the study conducted by Kokane et al(2015)⁸. In the present study a significant number of neonates i.e.14 neonates in Isoxsuprine group were having apgar score less than 7 at 1 & 5 min as compared to 6 neonates in Nitroglycerin group. This is statistically significant because neonates in Isoxsuprine group were having birth weight less as compared to Nitroglycerin group and also they were preterm. 11 neonates in nitroglycerin group and 16 neonates in isoxsuprine group required NICU admission. Out of which 4 neonates in Nitroglycerin group and 10 neonates in Isoxsuprine group required neonatal resuscitation. 2 neonates in nitroglycerin group & 4 neonates in isoxsuprine group developed RDS and same neonates required ventilatory support. No any neonatal deaths found in our study.

Our results are in corroboration with Kokane et al (2015)⁸ where 8 neonates in nitroglycerin group &13 neonates in isoxsuprine group were having apgar score <7 and same neonates required neonatal resuscitation.11 neonates in nitroglycerin group and 17 neonates in isoxsuprin group required NICU admission .out of which 3 neonates in nitroglycerin group and 5 neonates in isoxsuprine group developed respiratory distress syndrome and same required ventilatory support.

4. Results

In our study Nitroglycerin group had 17(34%) patients in the age group of 16-20 years, 22(44%) patients in the age group of 21-25 years, 7(14%) patients in the age group of 26-30 years, 3(6%) patients in the age group of 31-35 years and 1(2%) patients in greater than 35 years of age group. The mean age of patients was 23.32 years.

Table 1: Distribution of patients according to Maternal age

Age group (in yrs)	Nitroglycerin group		Isoxsuprine group	
	F	%	F	%
16-20	17	34%	9	18%
21-25	22	44%	23	46%
26-30	7	14%	12	24%
31-35	3	6%	6	12%
>35	1	2%	0	-
Total	50	100%	50	100%
Mean \pm SD	23.32 \pm 4.42		24.72 \pm 4.18	

p=0.107

Isoxsuprine group had 9(18%) patients in the age group of 16-20 years, 23(46%) patients in the age group of 21-25 years, 12(24%) patients in the age group of 26-30 years and 6(12%) patients in 31-35 years of age group. The mean age of patients was 24.72 years. This difference in mean age of patients in both the groups is statistically not significant.

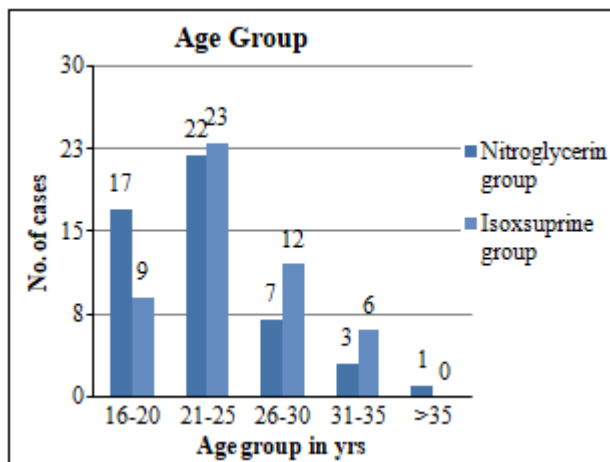


Figure 1

Table 2: Distribution of patients according to education/literacy

Age group (in yrs)	Nitroglycerin group		Isoxsuprine group	
	F	%	F	%
<SSC	35	70%	36	72%
SSC	6	12%	4	8%
> SSC	9	18%	10	20%
Total	50	100%	50	100%

p=0.793

Most of patients in both groups were educated upto secondary level i.e. 35 (70%) & 36 (72%) patients in Nitroglycerin & Isoxsuprine group respectively. This difference is statistically not significant.

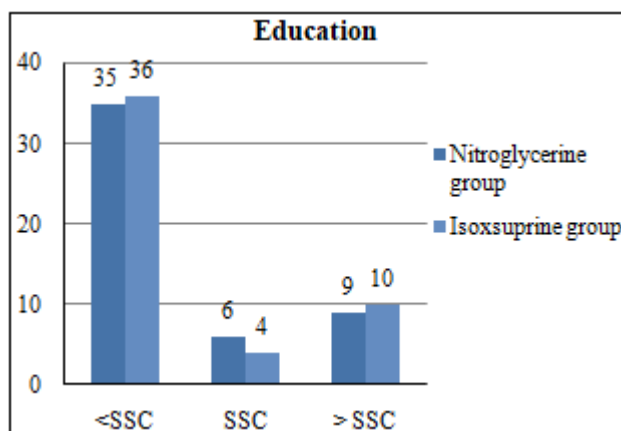


Figure 2

Table 3: Distribution of patients according to socioeconomic status

Socioeconomic status	Nitroglycerin group		Isoxsuprine group	
	F	%	F	%
Lower	27	54%	35	70%
Lower middle	7	14%	9	18%
Middle +	16	32%	6	12%
Total	50	100%	50	100%

p=0.05

Majority of patients in our study were from lower socioeconomic status - 27 (54%) & 35 (70%) patients in Nitroglycerin & Isoxsuprine group respectively. In Nitroglycerin group 7(14%) patients belonged to lower middle class group and 16(32%) patients belonged to middle

class group. In Isoxsuprine group 9(18%) patients belonged to lower middle class group and 6(12%) patients belonged to middle class group. There is no statistical difference in socioeconomic status of both groups.

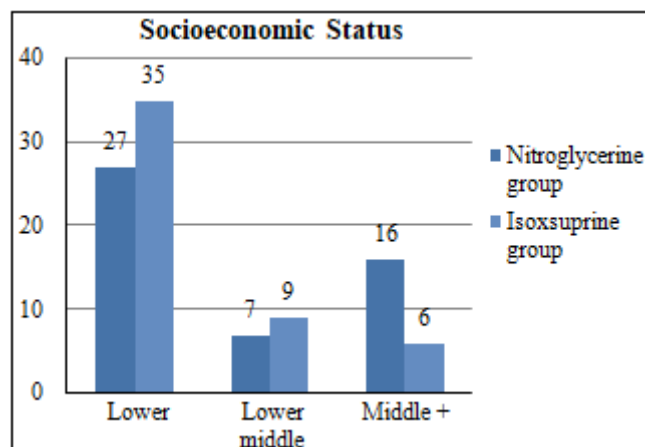


Figure 3

Table 4: Distribution of patients according to parity/Obstetric score

Parity/Obstetric score	Nitroglycerin group		Isoxsuprine group	
	F	%	F	%
Primigravida	24	48%	25	50%
Gravida 2	18	36%	13	26%
Gravida 3 & above	8	16%	12	24%
Total	50	100%	50	100%

p=0.441

In our study incidence of preterm labour was more in primigravida 24 (48%) patients Nitroglycerin group whereas 25(50%) in Isoxsuprine group. This difference is statistically not significant in both the groups.

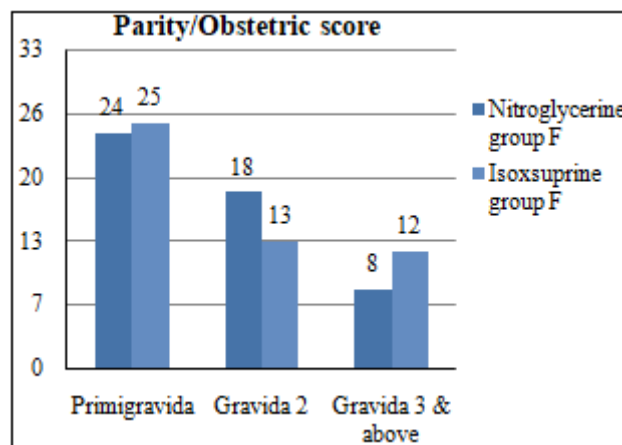


Figure 4

Table 5: Distribution of patients according to Gestational Age at Admission

Gestational age at admission (weeks)	Nitroglycerin group		Isoxsuprine group	
	F	%	F	%
25-27.6	0	-	1	2%
28-30.6	6	12%	7	14%
31-33.6	25	50%	23	46%
34-36.6	19	18%	19	18%
Mean \pm SD	33.02 \pm 1.86		32.96 \pm 2.17	

p=0.883

In our study majority of patients in Nitroglycerin group 25 (50%) patients were between 31-33.6 weeks of gestation followed by 19 (38%) patients in 34-36.6 weeks of gestation while in Isoxsuprine group 23 (46%) patients were between 31-33.6 weeks of gestation followed by 19 (38%) patients in 34-36.6 weeks of gestation. The minimum and maximum gestational age at admission was 28.3 & 35.4 weeks respectively in Nitroglycerin group and 26.1 & 35.5 weeks respectively in Isoxsuprine group.

The mean gestational age at admission in Nitroglycerin group of was 33.02 ± 1.86 weeks and in Isoxsuprine group was 32.96 ± 2.17 weeks. Thus there is no statistical significant difference in mean gestational age at admission in both these groups.

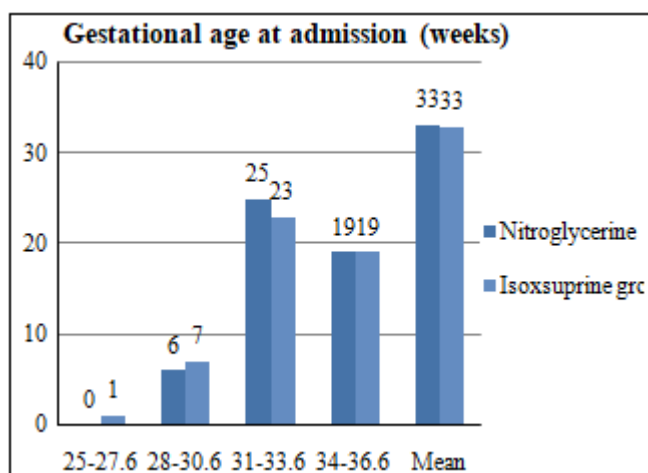


Figure 5

Table 6: Changes in Cervical Dilatation

	Nitroglycerin group	Isoxsuprine group	P value
On Admission (Mean \pm SD)	1.60 \pm 0.34	1.59 \pm 0.33	0.881
After 48 hrs (Mean \pm SD)	1.67 \pm 0.53	1.84 \pm 0.66	0.158
Dilatation changes	0.07 \pm 0.32	0.25 \pm 0.59	0.062

In Nitroglycerin group the mean cervical dilatation at admission and after 48 hours was 1.6 cm & 1.67 cm respectively. The change in mean cervical dilatation was 0.07 cm whereas in Isoxsuprine group the mean cervical dilatation at admission and after 48 hours was 1.59 cm & 1.84 cm respectively. The change in mean cervical dilatation was 0.25 cm. This difference is statistically not significant.

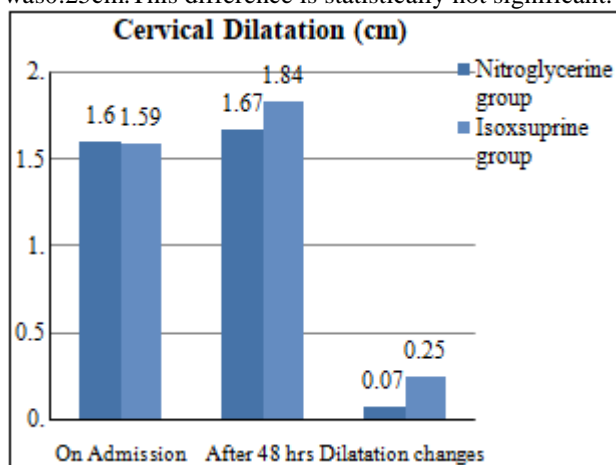


Figure 6

Table 7: Distribution of patients according to Gestational Age at Delivery (wks)

Gestational age at delivery (weeks)	Nitroglycerin group		Isoxsuprine group	
	F	%	F	%
25-27.6	0	-	0	-
28-30.6	0	-	0	-
31-33.6	5	10%	9	18%
34-36.6	17	34%	22	44%
>37	28	56%	19	38%
Mean \pm SD	36.32 \pm 2.07		35.52 \pm 2.10	

p=0.058

In Nitroglycerin group majority of patients i.e. 28 (56%) patients were delivered more than 37 weeks of gestation followed by 17 (34%) patients between 34-36.6 weeks of gestation whereas in Isoxsuprine group majority of 22 (44%) patients between 34-36.6 weeks of gestation followed by 19 (38%) patients were at more than 37 weeks of gestation. The mean gestational age at delivery of patients was 36.32 ± 2.07 weeks in Nitroglycerin group and 35.52 ± 2.10 weeks in Isoxsuprine group. Thus there is statistically no difference in gestational age at delivery in both groups.

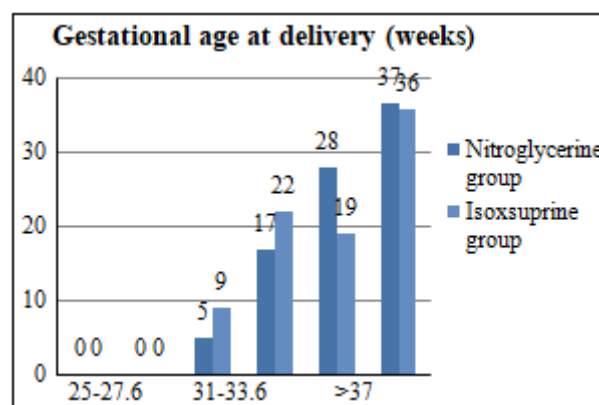


Figure 7

Table 8: Duration of Prolongation of Pregnancy

Duration of prolongation of pregnancy	Nitroglycerin group		Isoxsuprine group	
	F	%	F	%
< 48 hrs	2	4%	3	6%
48 - 72 hrs	3	6%	6	12%
>3-7 days	9	18%	14	28%
> 7 days	36	72%	27	54%
Total	50	100%	50	100%

In Nitroglycerin group 2 (4%) patients delivered within 48 hours, 3 (6%) patients delivered within 48-72 hours, 9 (18%) patients delivered between 3 - 7 days and 36 (72%) patients delivered in more than 7 days whereas in Isoxsuprine group 3 (6%) patients delivered within 48 hours, 6 (12%) patients delivered within 48-72 hours, 14 (28%) patients delivered between 3 - 7 days and 27 (54%) patients delivered in more than 7 days. Thus majority of patients were delivered >7 days in Nitroglycerin group as compared to Isoxsuprine group.

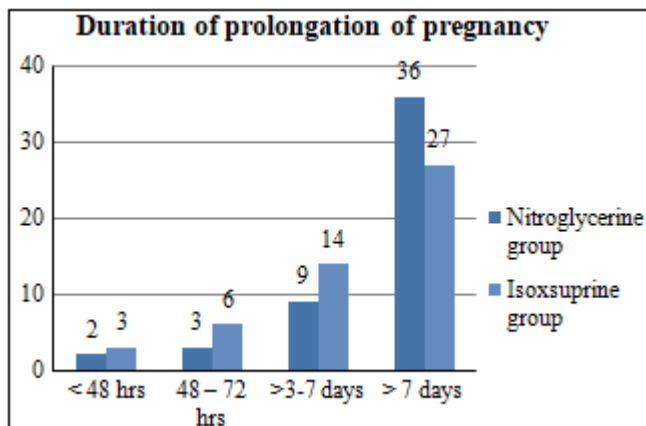


Figure 8

Table 9: Distribution of patients according to Mean duration of Prolongation of Pregnancy in Days

Mean Duration of prolongation of pregnancy in days	Nitroglycerin group	Isoxsuprine group
Mean \pm SD	25.72 \pm 19.63	20.34 \pm 17.53
Minimum	2	2
Maximum	75	55

p=0.152

The mean duration of prolongation of pregnancy in Nitroglycerin group was 25.72days and in Isoxsuprine group it was 20.34days. However this difference was statistically not significant. The minimum and maximum duration in Nitroglycerin group was 2 and 75 days respectively. The minimum and maximum duration in Isoxsuprine group was 2 and 55 days respectively

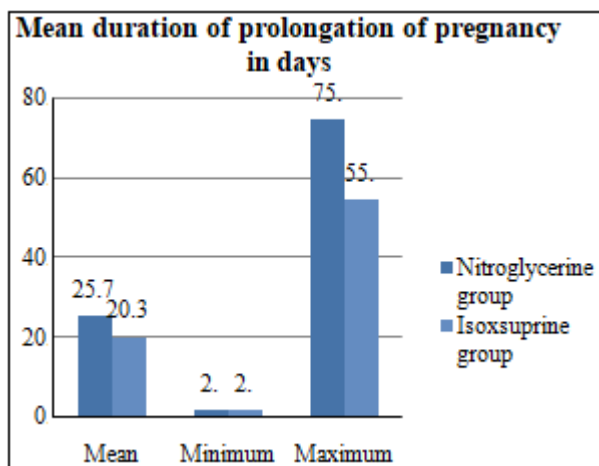


Figure 9

Table 10: Patients According to Success or Failure Tocolysis

	Nitroglycerin group		Isoxsuprine group	
	F	%	F	%
Successful Prolongation \geq 48 hrs tocolysis	48	96%	47	94%
Failure of tocolysis < 48 hrs	2	4%	3	6%
Total	50	100%	50	100%

p=0.999

In our study tocolysis therapy is successful in 96% patients in Nitroglycerin group as compared to 94% successful in

Isoxsuprine group. But this difference is statistically not significant.

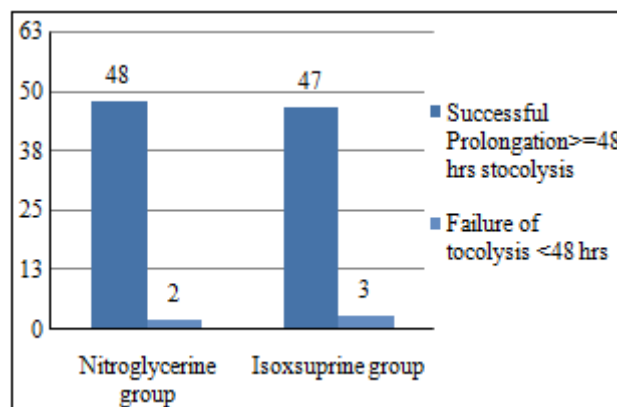


Figure 10

Table 11: Maternal Side Effects

	Nitroglycerin group		Isoxsuprine group		P value
	F	%	F	%	
Tachycardia	0	-	42	84%	<0.001
Headache	24	48%	0	-	<0.001
Palpitation	0	-	39	78%	<0.001
Hypotension	2	4%	0	-	0.495
Giddiness	0	-	4	8%	0.117
Local irritation	1	2%	0	-	0.999
Flushing	0	-	0	-	-
Pulmonary oedema	0	-	0	-	-

In Nitroglycerin group headache was present in 24(48%) patients as compared to no patients in Isoxsuprine group. This difference is highly significant p value is <0.001. Also tachycardia and palpitation was present in 42(84%) patients and 39(78%) patients respectively in Isoxsuprine group as compared to Nitroglycerin group where no patients had tachycardia or palpitation. This is highly significant as P value is <0.

In Nitroglycerin group other side effects like hypotension and local irritation was noted in 2(4%) patients and 1(2%) patients respectively. In Isoxsuprine group giddiness was found in 4 (8%) patients. The difference in these side effects is not statistically significant. No other side effects noted in both groups.

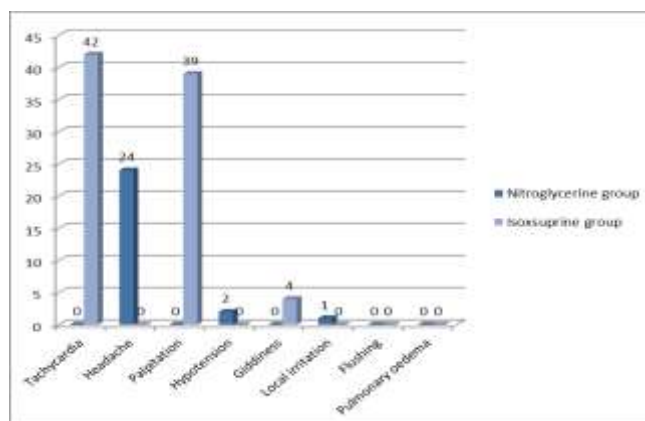


Figure 11

Table 12: Fetal Side Effects

Fetal Side effects	Nitroglycerin group		Isoxsuprine group	
	F	%	F	%
Fetal distress(Bradycardia) (FHS <110 bpm)	2	4%	1	2%
Fetal tachycardia (FHR>160bpm)	5	10%	6	12%

p=0.999

Fetal distress (FHR<110bpm) was seen in 2 (4%) patients in Nitroglycerin group as compared to 1 (2%) patient in Isoxsuprine group. Also Fetal tachycardia was present in 5 (10%) patients in Nitroglycerin group as compared to 6 (12%) patients in Isoxsuprine group. This difference is statistically not significant.

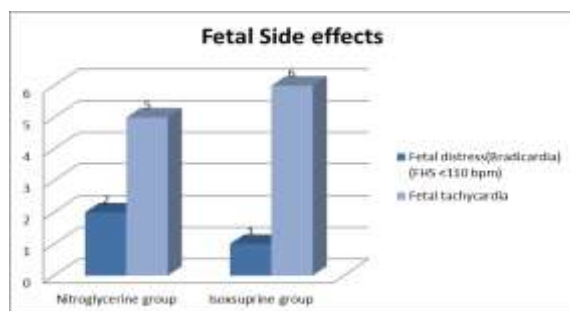


Figure 12

Table 13: Mode of Delivery

Mode of delivery	Nitroglycerin group		Isoxsuprine group	
	F	%	F	%
Normal	40	80%	38	76%
Instrumental	3	6%	2	4%
LSCS	7	14%	10	20%

p = 0.677

In Nitroglycerin group, 40 (80%) patients delivered vaginally, 3 (6%) patients delivered vaginally by instrumental delivery and 7(14%) patients delivered by caesarian section whereas In Isoxsuprine group, 38 (76%) patients delivered vaginally, 2 (4%) patients delivered vaginally by instrumental delivery and 10 (20%) patients delivered by caesarian section. This difference is statistically not significant in both the groups.

In our study the mean birth weight of infants delivered was 2.45 kg in Nitroglycerin group and 2.22kg in Isoxsuprine group. This difference was statistically significant.

The minimum and maximum weight in Nitroglycerin group was 1.4 and 3.3 kg respectively whereas the minimum and maximum weight in Isoxsuprine group was 1.2 and 3.0 kg respectively.

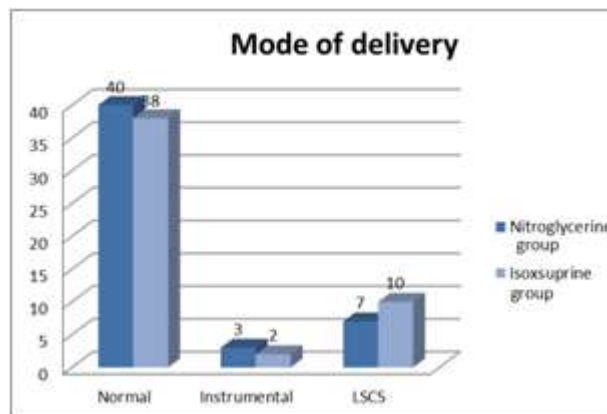


Figure 13

Table 14: Birth Weight in kg

Birth weight in Kg	Nitroglycerin group	Isoxsuprine group	P Value
Mean \pm SD	2.45 \pm 0.423	2.22 \pm 0.446	0.008
Minimum	1.4	1.2	
Maximum	3.3	3	

In our study the mean birth weight of infants delivered was 2.45 kg in Nitroglycerin group and 2.22kg in Isoxsuprine group. This difference was statistically significant.

The minimum and maximum weight in Nitroglycerin group was 1.4 and 3.3 kg respectively whereas the minimum and maximum weight in Isoxsuprine group was 1.2 and 3.0 kg respectively.



Figure 14

Table 15: Neonatal Outcome

Neonatal Outcome	Nitroglycerin group	Isoxsuprine group	P Value
Apgar < 7 at 1 & 5 min	6	14	0.039
Neonatal resuscitation	4	10	0.147
NICU admission	11	16	0.368
Respiratory distress syndrome	2	4	0.678
Ventilatory support	2	4	0.678
Neonatal death	0	0	-

In our study 6 neonates in Nitroglycerin group and 14 neonates in Isoxsuprine group have apgar score <7. This is statistically significant as p<0.05.

4 neonates in Nitroglycerin group and 10 neonates in Isoxsuprine group required neonatal resuscitation.11

neonates in Nitroglycerin group and 16 neonates in Isoxsuprine group required NICU admission out of which 2 neonates in Nitroglycerin group and 4 neonates in Isoxsuprine group developed respiratory distress syndrome and required ventilator support. This difference is statistically not significant in both the groups.

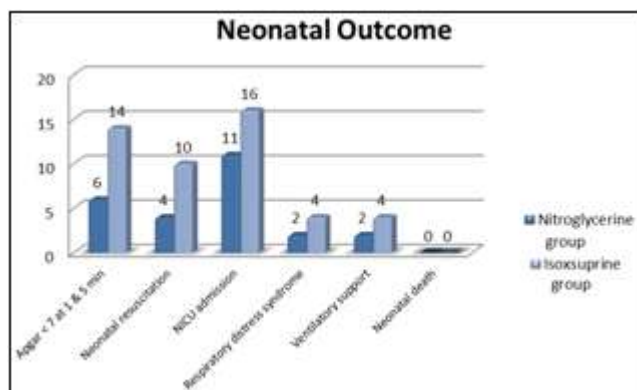


Figure 15

5. Conclusion

Preterm labour is the leading cause of perinatal morbidity and mortality. It should be identified as early as possible and corticosteroids should be administered within first 48 hrs to reduce rate of respiratory distress syndrome and short and long term complications of preterm birth. The approaches which prevent and treat preterm labour will have great impact on society and long term public health care costs. Modifiable or preventable causes of preterm labour such as anaemia malnutrition, infection, cervical encirclage, etc. should be identified at the earliest stage and treated.

All efforts should be made to continue pregnancy till term for healthy mother and healthy baby.

In the present study nitroglycerin and isoxsuprine are used as tocolytic agents. Though both the drugs are effective in prolongation of pregnancy for first 48hrs, but transdermal nitroglycerin appears to be better tolerated by patients and the side effects are lesser as compared to isoxsuprine hydrochloride except headache. However headache is treatable with analgesic like paracetamol. Nitroglycerin did not have to be administered by painful injections which was required in isoxsuprine, it was more acceptable by patients with preterm labour. Also apgar score was better in Nitroglycerin group.

Thus nitroglycerin appears to be safe, cost effective, non-invasive method to treat preterm labour within first 48hrs.

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