IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 4 Ver.VI (Apr. 2015), PP 12-16
www.iosrjournals.org

Comparative Study of transdermal NTG patch versus Oral Nifedipine in the pevention of Preterm Labour

Dr. M.Sandhya Rani, Assistant Professor, Dr.V.A.A.Lakshmi, Associate Professor,
Dept of Obstetrics&Gynaecology,GGH/GMC,GUNTUR

Abstract: *Comparison between transdermal Nitroglycerine and oral Nifedipine was done to assess effectiveness and safety of drugs.*

Material And Methods: *This study was conducted in the Department of Obstetrics and Gynecology in Government General Hospital, Guntur. Randomised control study in 100 women of preterm labour were enrolled after the informed consent. Among them 50 women received NTG Patch (Group I) and 50 women received oral Nifedipine(GroupII).*

Result: *Successful tocolysis for 90% of patients in Group I and 94% in Group II which was statistically significant (Pvalue 0.541).Preterm labour is more common in primi gravida and second gravida.90% of cases remain undelivered within 48 hours in Group I and 88% in Group II.*

Conclusion: *Nitroglycerine patch is as effective as Nifedipine in suppression of preterm labour and in prolonging pregnancy. Although the rate of side effects were more with Nitroglycerine, most common side effect was headache which can be controlled with analgesics. Cardiovascular side effects were nil compared with Nifedipine. Nitroglycerine is well tolerated and safe for the mother and fetus.*

I. Introduction:

One of the most challenging problem of obstetrician is the management of pretern labour. preterm briths are the most important entity because most common cause of perinatal mortality is preterm births. About 75 - 80% of perinatal deaths occur in pretem infants.

Perinatal mortality in pretem babies is 2 - 7 times more than term babies in India. Real reduction of pretem delivery will only take place through an improved understanding of physiology of labour.

Identification of the patient in risk of preterm labour, prediction and prevention of its occurrence and early detection of its onset and elective tocolysis.

As the etilogy is multifactorial and freqcently unknown, prevention is also limited.

According to WHO - preterm labour is < 37 completed weeks (259 days) from the 1st day of last menstrual period. [1]

The tocolysis used to prevent preterm labour basically aims prolonging the pregnancy at least for 48 - 72 hrs and so provides adequate time to administer 2 doses of corticosteroids which would help in preventing respiratory distress syndrome in newborn. If delivery occurs in 7 days it will also provide opportunity to transfer the women to a higher medical centre where adequate NICU facilities can be provided to the neonate as and when required. [2]

Over the past few years variety of tocolytic drugs (Isoxsuprine,Ritodrine,Nifidepine)with different pharmacological action have been used to supress pretem labour.

The Ca^{2+} channel blockers have occupied the first Choice as tocolytic therapy in various world medical centres, Brazil. [3]

Nitroglycerin is a drug with high first pass inactivation in liver by Glutathione dependent organic nitrate reductase. To avoid it transdermal use of drug is benificial [4] and it is also cost effective.

In this study transdermal NTG Patch TTS 10 containing 50mg NTG with contact Surface area of 20 sqmm and rate of release 0.4 mg/hr. Oral Nifedipine 30 mg loading dose , followed by 20mg after 90 minutes and then 10 mg 8th hourly was given for tocolysis.

II. Methodology:

This study was undertaken at Government General Hospital, Guntur from November 2011 to October 2012.

Selection Of Patients:

50 Patients who were admitted and clinically diagnosed as preterm labour were selected randomly after inculsion criteria were fulfilled.The selected patients were randamised either to group I, treated with Nitroglycerine patch or Group II, treated with Nifidepine with 50 patients in each group.

Inclusion Criteria:

Gestational age between 28 - 37 weeks,painful uterine contractions of 4 in 20 minutes or 8 in 60 minutes,intact membranes,effacement of ≥ 80%,cervical dilatation > 1 cm and < 3 cm.

Exclusion Criteria:

Antepartum haemorrhage,eclampsia and severe preeclampsia,heart disease causing moderate to severe functional impairment, severe anemia, fetal demise,fetal congenital malformations,documented ruptured membranes,cervical dilatation > 3 cm,chorioamnionitis,sensitivity or contraindication to Nitroglycerine or Nifidepine and hypotension (Systolic BP < 60 mm of Hg).

When a case of preterm labour meeting the inclusion criteria was admitted, detailed present and past obstetric history was taken.Vital baseline parameters like pulse, BP, temperature were recorded, detailed per abdomen, per speculum and per vaginal examinations were done.

The following investigations were done in the study subjects as soon as diagnosis was established:

Haemoglobin %,blood grouping and typing,complete blood count,urine routine and culture and high vaginal swab for culture and sensitivity.

Informed Consent was taken.

Group I:

Nitroglycerine patch l0 mg with brand name Nitroderm was applied transdermally to lateral aspect of thigh. If there was no reduction in contraction frequency or strength within one hour an additional patch was applied. No more than 2 patches were applied per 24 hours. The patch was removed every 24 hours and fresh patch applied till uterine contractions completely subsided or for a maximum of 7 days.

Monitoring:

1.Half an hourly abdominal palpation to note frequency and strength of contractions for 2 hrs and then 6th hourly.

2.Pulse, BP, Fetal heart rate monitoring every 1/2 hourly for 2 hours and the 6th hourly.

3.Close monitoring for any side effects.

Treatment was discontinued, if there was maternal tachycardia greater than 120 beats / minute, drop of blood pressure 15mm per Hg or more from baseline diastolic pressure, fever more than 100^0F or premature rupture of membranes.If contractions subside, patients were discharged and assessed every week in antenatal clinics until delivery.

Group II :

Tablet Nifedipine 30 mg loading dose was given, followed by 20 mg after 90 minutes and then 10 mg 8th hourly was given for tocolysis.

Monitoing of Pulse, BP, abdominal palpation to note frequency and strength of contractions was done every 1/2 hourly for 2 hours and then 6th hourly thereafter.If contractions subside, patient was discharged and assessed every week in antenatal clinics till delivery.

Treatment was considered successful if uterine contraction subsided and tocolysis was achieved for more than 48 hours. All patients received injection Betamethasone 12 mg IM, 24 hours apart, 2 doses and oral Amoxycillin 500mg 8th hourly. Gestational age at delivery, mode of delivery, birth weight, APGAR at 1 minutes and neonatal outcome were recorded.

III. Result:

Total no.of deliveries during study period:8494

Total number of preterm labour cases:445

Incidence of preterm labour:5.23%

Total no. of cases assigned for study were :100

They were randomly divided into 2 groups of each.

Group I – NTG Patch

Group II – Oral Nifedipine

Table 1: Distribution according to mean maternal age:

Groups	No. of Patients	Maternal age in years
NTG	50	21.68 yrs
Nifedipine	50	22.18 yrs

Table 2. : Distribution according to previous preterm birth and obstetric formula:

	Group - I		Group - II		Total		
	No.of pt.	%	No.of pt.	%	No.ofpt.	%	Pvalue: 0.65
Primi	21	42	22	44	43	43	
Gravida 2	19	38	22	44	41	41	Pvalue: >0.05
Gravida 3	5	10	2	4	7	7	
> Gravida 3	5	10	4	8	9	9	
Previous Preterm delivery	10	20	8	16	100	100	P value : 0.71

Table 3: Distribution according to gestational age:

Gestational age in Weeks	Group – I		Group - II		
	No. of Pt.	Percentage	No. of Pt.	Percentage	
28 - 30.6	7	(14%)	10	(20%)	P = 0.712
31 - 33.6	27	(54%)	26	(52%)	P > 0.05
34 - 36.6	16	(32%)	14	(28%)	

Table 4: Distribution according to prolongation of pregnancy in days :

Prolongation of pregnancy in days	Group I		Group II	
	No. of Pt.	Percentage	No. of Pt.	Percentage
< 2 days	5	(10%)	6	(12%)
3 - 7 days	13	(26%)	17	(34%)
8 - 14 dyas	9	(18%)	8	(16%)
15 - 21 days	9	(18%)	9	(18%)
22 - 28 days	8	(16%)	2	(4%)
29 - 35 days	2	(4%)	4	(8%)
36 +	4	(8%)	4	(8%)

P value : 0.541

Table 5: Distribution According to maternal side effects:

Maternal Side effects	Group I		Group II	
	No. of Pt.	Percentage	No. of Pt.	Percentage
headache	16	(10%)	3	(0%)
Skin rash	3	(6%)	0	(0%)
Tachycardia	1	(2%)	4	(8%)
Hypotention	0	(0%)	7	(14%)
Nausea	2	(4%)	0	(0%)
Flushing	0	(0%)	1	(2%)

P value < 0.001

Table 1 : Mean age in group I patients is 21.68 and group II is 22.18 the difference is not statisticaly Significant. In other studies like Kumar Aruna[4] mean age group was 21 - 25 yrs. Goffinet F[6] 15 -19 years.Thus in the present study maternal age distribution is comparable with the study conducted by Goffinet F.

Table 2 : Preterm labour is more commonly seen in primigravida and second gravida in both groups. Like in other Studies Goffinet F[6] Nullipara, Smith GN[5] primi gravida.

Table 3 : Group I - 80%, **Group - II** - 88%, the difference between 2 groups is not statistically significant. Out of 100 patients 18 patients had previous preterm. Majority of cases in both groups were between 31 to 33.6wks of gestational age that is 54% in Group I & 52 % in Group II.

Table 4 : 90% of cases remain undelivered within 48 hours in Group I and 88% Group II. Tocolysis was unsuccessful in 5 (10%) in Group I and 6 (12%) patients in Group II. The success in other studies Lees[13] et al 92.3%, Krishna et al[7] 100%, Rowland[8] 90% for NTG Patch. Oral Nefidepine success rate in another studies Baser Archana[13] 91%, Gulati A[9] 80%, Ferguson JE et al[14] 84%.

Table 5 : Headache (32%) was the most common side effect in Group I patients .Tachycardia & hypotension were the most common and other side effects which were observed were skin rash, tachycardia and nausea in Group I patients and flushing in Group II patients. Complications were higher in Group I patients accounting for 44% in Group I and 30% in Group II patients and these were statistically significant. Cardio vascular side effects were minimal in Group I patients compared to Group II patients.

IV. Discussion:

Prematurity is the greatest single problem in perinatal medicine (Zuspan 1972, Ried and Ryan et at 1972). Despite the availability of tocolytic agents the rate of prematurity has not declined over the past few years for several reasons.

Firstly, the etiology is usually not known. So it is difficult to devise a method that will predict which group of patients go into labour and delivery.

Second, the signs and symptoms of threatened preterm labour are frequently subtle. Thus very often patients present themselves for care too late to the obstetricians to attempt to inhibit preterm labour and prevent a premature delivery.

Thirdly, although most cases fall into the category of idiopathic preterm labour, certain clinical entities like PIH, APH etc, may require immediate termination regardless of maturity of fetus.

The incidence of preterm labour in Government General Hospital, Guntur from November 2011 to October 2012 was 5.23% in our study.In another study of M. Kupfermine (7 - 9%), James E Ferguson (9 - 6%), Castracane VD [12](7-12%),Kumar Aruna[4] (7-10%), Lumley J[11] (6-10%),Vijay, Roy [10](5 - 10%).

V. Conclusion:

Nitroglycerine patch is as effective as Nifedipine in suppression of preterm labour and in prolonging pregnancy. Although the rate of side effects were more with Nitroglycerine, most common side effect was headache which can be controlled with analgesics. Cardiovascular side effects were nil compared with Nifedipine. Nitroglycerine is well tolerated and safe for the mother and fetus. Same result is seen in the study of Sachan Rekha, Gupta Pooja et al [15].

References:

[1]. World Health ORganization (WHO) 1993. International Statistical Classification of Diseases and Related Health Problems. 10th Revision, Vol. II. Geneva, Switzerland. WHO.
[2]. Crowley, P. 2002. Prophylactic corticosteroids for preterm birth (Cochrane review) .
[3]. Robertson RM and Robertson D. Drugs used for the treatment of myocardial ischemia. In : Joel GH, Alfred Goodman Gilman, Lees EL (eds), Goodman and Gilman's The pharmacological basis of therapeutics. 9th edition, McGraw Hill. 1996, pp 759-779.
[4]. Aruna Kumar, Bharadwaj B, Pawar Namita. Glyceryltrinitrate patch in management of preterm labour. J Obstet Gynecol India 2001 : 51(6) : 55-57
[5]. Smith GN, Walker MC, Mc Grath MJ. Randomised, double - blind placebo controlled pilot study asessing Nitroglycerine as a tocolytic. Br J Obstet Gynecol 1999, 106 : 736 - 739.
[6]. Goffinet F. Primary predictors of preterm labour. Br J Obstet Gynecol 2005, 112 : 48-50.
[7]. Krishna U, Damle DS. Nitroglycerine skin patch application for tocolysis in premature onset of labour. J Obstet Gynaec Toaday 1996, I(4) : 305-307.
[8]. Rowland S, Tri dinger I. Nitroglycerine patch in preterm labour. Aus Nzj Obstet Gynecol 1996; 36 : 377.
[9]. Gulati Aarti, Rai Uma. Suppression of preterm labour with Nifedipine. J Obstet Gynecol India 1993; 43 (2) : 196 - 201.
[10]. Roy, Vijay, G S Prasad and K Latha, Tocolysis with ritodrine : a comparative study in preterm labour. Pak J Med Sci, Jan - Mar 2006. Vol 22 (1), 64-69.
[11]. Lumley J. Defining the problem : the epidemiology of preterm birth. Br. J Obstet Gynecol 2003; 110 : 3-7
[12]. Castracane VD. Endocrinology of preterm labour. Clin Obstet Gynecol 2000; 43(4) : 713 - 715
[13]. Baser Archana, Mukerji Akhilya. Suppression of preterm labour by calcium antagonist Nifedipine. J Obstet Gynecol India 1992; 46(6) : 151-154.
[14]. Feguson JE, Dyson DC, Schutz T. A comparision of tocolysis with Nifedipine or Ritodrine : analysis of efficacy and maternal, fetal and neonatal outcome. Am J Obstet Gynecol 1990; 163 : 105-111.
[15]. Sachan Rekha, Gupta Pooja et al Clinical Evaluation of Transdermal Nitroglycerine in preterm Labor in Tertirary Care teaching Hospital in Lucknow.