

Use of Nifedipine as a Tocolytic Agent in Cases of Preterm Labour



Medical Science

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ABSTRACT

Over years, preterm birth is the most important determinant of adverse infant outcome in both survival and quality of life. In our study total 54 patients with preterm labour between 28 to 36 weeks of gestation were tocolysed with Nifedipine to increase the intrauterine lifespan of fetus. Close monitoring was done to detect the known side effects of the tocolytic drugs like hypotension, tachycardia, nausea, headache, flushing and palpitation. It was found in this study that Nifedipine significantly arrests the preterm labour with minimal side effects.

INTRODUCTION:

Preterm labour is defined by WHO as any delivery occurring prior to 37 completed weeks of gestation from the first day of last menstrual period. It is a major cause of neonatal and infant morbidity as well.[8] Activity in the uterine muscle, in vitro, is dependent upon extracellular calcium [5] so it will be inhibited by calcium antagonists.

In past three decades the effects of the calcium antagonist Nifedipine have been studied on non-pregnant uterine musculature[4,9], postpartum uteri[5], in early pregnancy[1] and in preterm labour inhibition[10]. The aim of the present study is to assess efficacy of Nifedipine as a tocolytic agent & assess its maternal side effects.

AIMS & OBJECTIVES

1. To study the efficacy of Nifedipine in arresting preterm labour and prolonging pregnancy
2. To study the side effects of Nifedipine and its acceptability

MATERIALS & METHODS

During July 2010 up to October 2011, total 54 pregnant women who were admitted in hospital in preterm labour between 28 to 36 weeks of gestation were included in this study.

Inclusion Criteria

Onset of labour between 28 to 36 wks.

Uterine Contractions lasting at least for 20 seconds & coming at regular intervals.

Cervical dilatation of less than or 4 cm.

Membranes – intact.

Exclusion Criteria

Chorioamnionitis

Ante partum haemorrhage

Severe preeclampsia/eclampsia

Foetal distress

Severe intrauterine growth restriction

Foetal anomaly incompatible with life

Severe oligohydromnios

Technique and dosage

Preterm labour was diagnosed when at least one contraction lasting for at least 20 seconds coming every 5 minutes was noted.

Ultrasonography was done to confirm the foetal maturity and also cervical length. Baseline pulse rate and blood pressure were measured.

Nifedipine tocolysis was initiated with a loading dose of 40mg given orally given in 2 doses 30 minutes apart. (20 mg as a stat dose followed by 20mg after 30 minutes) This was followed by 20mg given at intervals of 6 hours until complete cessation of uterine contractions.

Blood pressure and pulse rate were monitored half hourly after each dose of Nifedipine for 2 hours.

When maternal tachycardia rose above 140/min or blood pressure showed significant fall, the drug was withheld. If contractions were effectively abolished, the treatment was continued at least for 3 days, after complete cessation of contractions.

If the labour progressed in spite of administration of the drug or significant side effects noted, another tocolytic drug was used in the absence of cervical dilatation beyond 4 cm.

On admission, injection Betamethasone 12mg IM was given and was repeated after 24 hours if the patient remained undelivered.

Close monitoring was done to detect the known side effects of the tocolytic drugs like hypotension, tachycardia, nausea, headache, flushing and palpitation.

Outcome criteria

- Time taken to complete uterine relaxation
- Recurrence of uterine contractions
- Prolongation of pregnancy
- Need for other tocolytics

RESULTS:

.Age Incidence

In this study, the youngest patient was 17 years old and the eldest was 39 years old. Out of the 54 patients enrolled, half of the women i.e. 50% were primigravida. This may be explained on the ground that primigravida are more sensitive to labour pains and

seek medical help immediately.

In this study, registered cases attending antenatal clinics regularly were 85% as compared to unregistered cases who were 14.8% .

Table no. 1 describes different occupations of the women in the study. Around 65%patients were housewives followed by labourer which was 22%.As such, women doing heavy work were 27.8%(labourers and farmers)

Table No.1. Occupations

Occupation	No. of cases	%
House Wife	35	61.8
Service	4	7.4
Farmer	3	5.6
Labourer	12	22.2
Total	54	100.0

Table no 2 .Gastational Age On Admission:About 73% cases were less than 34 weeks.

Gestational Age in weeks	No. of cases	%
28 – 30	7	13.0
30 – 32	12	22.2
32 – 34	20	37.0
34 +	15	27.8
Total	54	100.0

Maternal risk factors which were observed in some of these patients(31.5%) were anaemia, bad obstetric history, urinary tract infection, and fever, history of cervical encircilage, infertility, polyhydromnios, twin gestation, and mild preeclampsia. 37 patients (68.5%) were without any risk factor.

Table No.3 Frequency of contractions

Frequency of contraction Number of contractions/10 minutes	No. of cases	%
2	15	27.8
3	35	64.8
4	4	7.4
Total	54	100.0

Table no 4.cervical dilatation on admission

Dilatation (cm)	No. of cases	%
0	11	20.4
<2	13	24.1
2+	30	55.5
Total	54	100.0

Table no 5.Cervical effacement on admission

Effacement %	No. of cases	%
0 -30	15	27.8
30 -40	18	33.3
40+	21	38.9
Total	54	100.0

Side effects observed are shown in

Table No 6 : They were tachycardia(18.5%),hypotension(16.7%),headache(38.9%),flushing(24.1%),and palpitations(31.5%). A single patient required to stop the treatment due to serious side effects. But overall there were no serious, life threatening side effects of the drug.

Table no 6 .Maternal Side Effects Due to Nifedipine

Side effects	No. of cases	%
Tachycardia	10	18.5
Hypotension	9	16.7
Headache	21	38.9
Palpitation	17	31.5
Flushing	13	24.1

The efficacy of drug was judged by time taken for complete relaxation and for how much time was the pregnancy prolonged.

Table No 7 .Time Taken For Relaxation

Time in hours	N	%
Less than 12	19	35.24
More than or equal to 12	27	50
Not relaxed	7	2.92
Treatment stopped	1	1.85
Total	54	100

The mean prolongation of pregnancy in weeks was 2.8 weeks i.e. around 16 days .In one case it is even up to 8 weeks with only in one case it is less than 24 hours.

Table no 8

Prolongation of pregnancy in weeks	No. of cases	%
<1	7	13.0
1 – 3	30	55.5
4 – 6	15	27.8
7 +	2	3.7
Total	54	100.0

As is seen in Table No.9 patients who delivered after 36 weeks were 46.3% .And 83.3% patients delivered after 32 weeks of gestation. Now, if we study this table in relation to Table no 8.,(in which gestational ages on admission are shown) then we come to know the benefit of tocolysis with Nifedipine .Seventy Three percent women were admitted with pregnancy less than 34 weeks due to preterm labour. After successful tocolysis with Nifedipine29.6%delivered between 34 to 36 weeks and 46.3%delivered after 36 weeks.

Table no 9.Gestational Age at Delivery

Gestational age in weeks	N	%
28to 34	13	24.1
34 to 36	16	29.6
36 to 40	25	46.3
Total	54	100

The duration of the treatment varied from 2 days up to 16 days. Patients who required treatment for up to 7 days were 66%. Maximum days required for treatment were 15 days. This is shown in Table No.10

Table no 10 Duration of treatment

Duration of treatment in days	No. of cases	%
≤2	7	13.0
v3 – 7	36	66.6
>7	11	20.4
Total	54	100.

Out of 54 patients 5 were given other tocolytic agent .In one case due to severe intolerance to the drug, in one case due to failure to achieve adequate tocolysis and in remaining three cases due to recurrence.

DISCUSSION:

Nifedipine which is a calcium channel blocker has been tried in the present study to know its efficacy in inhibiting preterm labour and to study its associated side effects and benefits. In present study, employment outside the house, in general, did not turned out to be a risk factor for preterm birth. However, various studies have shown beneficial effect of bed rest in preterm labour. In our study, incidence of preterm birth was more common in housewives who are considered comparatively less active. This may be because, in India, housewives have to do a lot of domestic work, and so they cannot be called to have sedentary life style.

Patients were admitted with varied symptoms but the commonest was pain in abdomen, about 98% of presented with abdominal pain. Next common symptom was p/v discharge, 74% of them presented with p/v discharge, and 59% with show i.e. blood stained sticky discharge. 5% had cervical dilatation more than or equal to 2 cm, 73 % had cervical effacement more than or equal to 30% After confirmation of diagnosis of preterm labour and fulfilling the inclusion criteria, Nifedipine was administered as per dosage schedule with close monitoring of pulse, blood pressure and any symptoms which are very disturbing to the patient.

In 53.7% of the case there were no side effects observed. In remaining 46.3% cases the observed side effects were tachycardia, hypotension, headache, flushing and palpitation. The most common symptom was headaches, in 38.9% cases. Only in one case treatment was stopped due to serious side effects where there was fall in systolic blood pressure by 40 mm of mercury, diastolic blood pressure fall was 30 mm of mercury and pulse became 150/mm. Otherwise no serious side effects were observed.

The success of tocolysis by Nifedipine was judge by time taken for complete relaxation, prolongation of pregnancy in weeks, and gestational ages at the time of delivery. In 85% patients uterus was completely relaxed within 24 hours. In 12% of patients though the frequency of contractions was reduced it failed to achieve complete relaxation. The mean value of prolongation of pregnancy in weeks was was 2.8 weeks (around 16 days). Only in one case it was less than 24 hours and in one patients we could achieve prolongation even up to 8 weeks.

Gestational age at the time of delivery was studied in relation to the gestational ages on admission. It is seen that 46.3% patients delivered after 36 weeks and 29.6% between 34 to 36 weeks.

We studied some findings on admission in relation to prolongation of pregnancy in weeks due to tocolysis,(as shown in

Table No.11 to 13), to see if we can predict the outcome of tocolysis prior to initiation of the treatment.

Table No.11 .Relation of Gestational age on admission with prolongation of pregnancy due to tocolysis

Gestation age on admission in weeks	N	Prolongation in weeks		Unpaired T
		Mean	SD	
28-32	19	2.34	2.08	1.35
32+	35	3.05	1.70	0.184

Table No.12.Relation of frequency of contraction with prolongation of pregnancy due to tocolysis

Frequency of contraction	N	Prolongaton of weeks		Unpaired T
		Mean	Standard deviation	
2	15	2.34	2.637	0.402
3-4	39	3.05	2.866	0.689

Table No.13.Relation of cervical dilatation with prolongation of pregnancy due to tocolysis

Dilation (cm)	N	Prolongaton of weeks		Unpaired T
		Mean	Standard deviation	
<2	24	3.52	1.90	2.692
>2	30	2.23	1.63	0.01

Table No.14.Relation of cervical length on sonography with prolongation of pregnancy due to tocolysis

Cervical length(cm)	N	Prolongaton of weeks		Unpaired T
		Mean	Standard deviation	
<2	27	1.85	1.44	4.367
>2	27	3.75	1.75	<0.001

These factors are summarized below in Table No.15

Table No.15 Predictors of prolongation of pregnancy

Predictors / Independent variables	Unpaired T	P
Cervical effacement	4.52	0.001 HS
Cervical dilatation	2.692	0.01 HS
Cervical length	4.367	0.001 HS
Gestational age	1.35	0.184 NS
Frequency of uterine contractions	0.402	0.689 NS

Nifedipine was more effective in arresting preterm labour and prolonging pregnancy in women with lower cervical dilatation and effacement. And it was more effective in patients with good cervical length. Gestational age on admission and frequency of contractions do not show any significant effect on prolongation of pregnancy. Data from other studies using Nifedipine to arrest preterm labour also showed the same results as our study. [2,3,6,7]

Conclusion

In all, we can conclude that Nifedipine can be used effectively for tocolysis without much serious side effects. This will help us in prolonging the stay of the baby inside the uterus as near to term as possible so that better neonatal survival is achieved. But of course due to the potential side effects of the drug patients have to be monitored strictly for their vital parameters like pulse and blood pressure during the tocolytic treatment with Nifedipine.

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