The Role of Nifedipine (Ca Channel Antagonist) in Suppression of Pre-Term Labour

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Summary : **The efficacy of Nifedipine was evaluated in 75 patients (age 22 to 35 years), for suppressing pre-term labour. Delivery was postponed for more than 3 days in 64 patients (85.3%). The tocolytic effect occurs within 20 minutes after oral ingestion of the drug. There was no hypotensive episode. Minor side effects occurred without adverse effects on Apgar Score of babies. Postponement of pre-term labour allowed time for corticosteroid administration to reduce the incidence of respiratory distress syndrome in new-borns.**

Introduction

A need for some means of postponing premature labour is evident as prematurity is the leading cause of perinatal morbidity and mortality. The incidence of low birth weight in India is around 30 to 40 per cent of which 12 to 18 per cent are associated with gestation age less than 37 weeks (Krishna Menon et al, 1982). In 32-36 weeks the incidence of RDS (Respiratory Distress Syndrome) is 15 to 20 per cent (Behrman and Vanghan 1983). The delivery of infants weighing 700 to 1500 gm gives an overall survival rate of approximately 50 per cent. If premature labour could be postponed without adversely affecting mother and until an acceptable fetal weight is achieved, it would be highly desirable. Foetuses between 28 and 32 weeks of gestational age need glucosteroids to enhance lung maturity. This can be achieved if delivery is postponed by 24-72 hours. Inhibition of uterine contractile activity for at least 3 days may therefore be regarded as an optimal action of any tocolytic agent. Obstetrical attempts to prevent these deliveries have been less successful than neonatological advances in saving these babies.

All these underline the need for an effective tocolytic drug. Nifedipine - a calcium channel blocker - is one such drug. Initial reports with use of nifidipine in postponing labour are encouraging and its use may help in diminishing early neonatal morbidities and mortalities.

Material and Method

Present study was conducted in SMS Medical College, Department of Obstetrics and Gynaecology at Mahila Chikitsalya, Jaipur in 75 patients with singleton pregnancy of gestational age of 28-37 weeks. All these patients had documented uterine contractions by external tocography with intact membranes and cervical effectment of 80 per cent along with cervical dilatation of 2 to 4 cm. Any fetal disorders like IUD, foetal distress, infection, polyhydramnios and IUGR were excluded from the study. Maternal disorders like PIH, heart disease, APH were also excluded.

A detailed history and informed consent were obtained. There was a 30 minute observation period during which time the fetal rate and uterine activity was assessed.

An initial dose of 30 mg of Nifedipine was given orally followed by 20 mg 8 hourly for 3 days, 2 doses of Inj. Dexamethasone 12 mg (I.M.) at 12 hourly interval were given along with it. The maternal pulse and blood pressure were recorded every 15 minutes for the first one hour and then hourly for 8 hours. Treatment was deemed successful if contractions were abolished and pregnancy was prolonged for 72 hours from the beginning of therapy.

Observations

Following was the age distribution of the cases, Fifteen (20 per cent) were below 21 years of age, 56 (74.8 per cent) between22 and 35 years, and 4 were above 35 years. Fifty eight (77.33%) cases were primigravidae, 15 (20%) were second to fifth gravidae and 2(2.66%) grand multipara. Five(6.66%) patients had gestation below 30 weeks (28-29 weeks), 58 (77-33%) between 30 to 33 weeks and 12 between 34 to 37 weeks. Significant fall of blood pressure and increase in pulse rate were not recorded in any of the patient and put on nifedipine therapy. The time interval between putting the patient on Nifedipine and delivery is shown in table 1. Overall success rate was 85.33 per cent (64 patients). Of these successful cases, 60 patients had normal delivery and 2 required forceps for maternal exhaution. Only two patients needed caesarean section due to prolonged second stage and foetal distress. As shown in table 1 the postponement of delivery for more than 3 weeks was seen in 42 patients while 4 delivered within 3-7 days of therapy. Transient side effects recorded are shown in Table 11. Table 111 shows foetal Apgar scores at delivery.

Table 1

Time Interval Between Administration of Nifidipine and Delivery

S.No.	Time from drug administration to delivery (days)	No. of cases	Percentage
1.	Below 3 days	11	14.66
2.	Below 3-7 days	4	5.33
3.	7-14 days	6	8.00
4.	15-21 days	12	16
5.	Above 21 days	42	56
Total		75	100.00

The table shows postponement of delivery by more than 3 days was achieved in 64 cases (success rate of 85.33%)

Discussion

Lowering the incidence of preterm labour is obviously a better way of reducing the neonatal morbidity and mortality especially in our country, where, sophisticated neonatal intensive care units are not available everywhere.

The results of this study show, postponement of delivery was achieved for 3 or more days in 85.33 per cent patients with nifedipine allowing time for corticosteroid administration to exert a favourable effect of reduceing incidence of RDS in the newborn (Liggins et al, 1972 and Block et al, 1977) a result comparable to an earlier study reported by Ulmsten in 1984.

The tocolytic effect occurred very soon after oral use of the drug and is of value in moving these patients from small unit to units with intensive care facilities. Similar results were reported by Ulmsten (1984).

In the series reported by Ulmsten et al (1980) and Ulmsten (1984); no relationship was found between gestational age and success or failure of the Nifedipine trial. This result is comparable to the present study. However, as with the betasympathomimetic drugs, the cardiovascular effects of calcium antagonists would theoretically be a limiting factor in their use. It has been found that nifedipine exhibits greater selectivity for inhibition of uterine activity relative to its cardiovascular effects (Granger et al, 1985). There are studies that suggest there may be transient cardiovascular effect for upto 2 hours (Ulmsten et al,

1980, Ulmsten 1984, and Read et al 1986). No hypotensive episodes were noted in our study. Transient maternal tachycardia was seen similar to that reported by Ulmsten et al (1980) and Read et al (1986). It is significant to note that side effects of nifedipine are easily reversible with intravenous saline and calcium (Hurst, 1985).

Table II
Transient Side Effects During Trial

Side Effects	Cases	Percentage
Headache	20	26.66
Palpitation	4	5.33
Dizziness	2	2.66
Nausea	6	8.00
Flushing	60	80.00
Tremors	4	5.33
Pruritis	5	6.66
Peripheral oedema	10	13.33

Table III
Apgar Scores at Delivery in Successful Cases

S.No.	Ap	No. of Cases	Percentage
1	Less than 7	2	3.12
2.	Greater than/= 7	62	96.87
Total		64	100.00

Block et al in 1977 demostrated that in fetuses between 28-33 weeks of gestation, of glucocorticoid therapy given to mother to accelerate fetal pulmonary maturation is appropriate and beneficial. To secure this effect the delivery should be delayed by 24-72 hours. Inhibition of uterine activity for at least 3 days may, therefore, be regarded as primary aim of any tocolytic therapy. The results of present study suggest this aim can be safely attained by use of nifedepine.

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