SUPPRESSION OF PRETERM LABOUR BY CALCIUM ANTAGONIST "NIFEDIPINE"

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SUMMARY

Premature birth is the main cause of neonatal morbidity and mortality. To avert the incoming premature labour is the aim of all obstetricians. In a single blind placebo controlled clinical trial calcium antagonist nifedipine was found to be effective in arrest of uterine contractions in 76% of the cases. The low cost, short duration of therapy, ease of administration, relatively early onset of effects and low fetal morbidity and mortality makes it an ideal substitute to conventional drugs.

INTRODUCTION

Intracellular calcium levels are the key to regulation of myometrial contractions, substances which impedes calcium entry by blocking calcium channels interfere with recovery of tension and cause relaxation. (Curie, 1980). Encouraging results in the treatment of preterm labour by nifedipine have been reported (Ulmsten et al 1980, Read and wellby, 1986).

MATERIAL & METHODS

Criteria for enrolment in study included patients between 28 to 36 weeks of Pregnancy getting regular uterine contractions at least once every 10 minutes associated with cervical dilatation of not more than 4 cms. Women were not suitable for inclusion in this study if they had - multiple pregnancy, polyhydramnios, ruptured membranes, history of previous preterm delivery, mid trimester abortion and antepartum haemorrhage.

Pregnancies were assigned to Group A (treatment group) and group B (control group). Selection criteria was same. 30 minutes were kept as period of observation.

An initial dose of 30 mg was given orally to each patient. This was followed by 20 mg. at 8 hourly interval for total 3 days. Immediately before and every 30 minutes for 2 hours after the first dose of nefedipine the pulse rate and Blood pressure were recorded. Follow up was done for further 48 hours after stopping the drug. Failure of therapy was registered if fetal membranes

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TABLE 1

Comparison of Cervical Dilatation to Percentage of success in two groups

Sr. No.	Cervical dilatation in cms.	Group A		Group B	
		No. of cases	Success %	No. of cases	Success %
1	1	11	91	8	50
2	2	28	82.2	29	13.7
3	3	11	45.46	13	0

Co-relation of days gained and cervical dilatation in two groups :

	r = -.4279	-.3846
	p = <.01	<.05
	Highly Significant	Insignificant

TABLE 2

Comparison of Percentage of success in Relation to uterine contractions in two groups

Sr. No.	Contraction	Group A		Group B	
		No. of cases	Success %	No. of cases	Success %
1	+	4	100	4	66.61+
2	++	23	91.4	29	13.71+
3	+++	28	54.52	15	0

Statistical corelation of days gained with uterine contractions in two groups :

	Group A	Group B
r =	-.5718	-.2836
p =	<.01	<.05
	Highly significant	Insignificant

TABLE 3

Mean days gained : There was highly significant difference between group A and group B

	Patients in mean days gained	
	Group A	Group B
n =	50	50
Mean days gained	10.62	00.66
S.D.	8.890	1.6566 days
	z = 13.27	P = << .01
	Highly significant	

TABLE 4

Comparison of success and perinatal mortality in two groups

Groups	No. of cases	Success %	P.N.M. %
A	50	76%	20%
B	50	16%	60%

ruptured, cervical dilatation progressed beyond 4 cms. Treatment was deemed successful if contractions stopped and no progress in cervical dilatation occured during treatment and there was no recurrence of contractions within 48 hours of stopping the treatment.

OBSERVATIONS

The present series included 100 patients of preterm labour. The patients were divided into two groups A and B and were matched for Age, Parity, Height, Socioeconomic status, and compared in terms of cervical dilatation, Uterine contractions, perinatal mortality and success in two groups. (see Table I to IV).

DISCUSSION

Nifedipine is a pyridone derivative. It acts by blocking calcium entry into the smooth muscle cells. Thus it interferes with excitation contractions coupling. It is completely absorbed after oral administration. Nifedipine is highly bound to serum proteins (92 - 98%). The half life of nifedipine in plasma is about 8 hours. Minor side effects were noted with nifedipine like - headache, flushing, tachycardia and fall in Blood Pressure.

Formann et al (1979) studied the effects of nifedipine on isolated human myometrium. A concentration related inhibitory effect on spontaneous activity of myometrial strips was ob-

served by Ulmsten et al, 1978. Nifedipine can be used for treatment of hyperactivity of uterine muscles induced by prostaglandins (Andersson 1979). Nifedipine has been shown to inhibit spontaneous, methyl ergometrine and Oxytocin induced post partum uterine contractions (Formann et al, 1982).

Higher mortality and morbidity associated with premature birth have stimulated interest to find out agent that will diminish or eliminate preterm uterine contraction and is an important area of research in obstetrics today. Beta blockers appears to be the most widely used drug at present, there are conflicting reports of their efficacy in suppression of established uterine activity. (Walters and Wood 1977) The conclusion reached in published studies is that therapeutic advantage is small and routine use of these agents can not be justified on present evidence, particularly in view of high evidence of side effects. While nifedipine has been found to exhibit greater selectivity for inhibition of uterine actively and few side effects (Granger et al, 1985).

Golichowski et al (1985), examined effictiveness of nifedipine by studying its ability to inhibit uterine contractions in pregnant ewe during labour and post partum periods and also assessed haemodynamic effects of tocolytice doses of nifedipine and compared it with ritodine in similar doses and nifedepine was found to be more effective.

As nifedipine is known to be a potent uterine relaxant, it might be expected to give rise to either hypotonic uterine action in labour or post partum haemorhage but Contantine et al, (1985) have noted no excess haemorrhage in their study.

CONCLUSION

Much can be gained by allowing the fetus to remain in uterus in its ideal environment because no incubator can substitute the uterus. In a single blind placebo controlled clinical trial, of 100 cases of premature labour the calcium antagonist nifedipine was found to be effective in suppression of preterm labour in 76% of the cases. No significant side effects were noted.

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