

EFFECT OF 9.5% ALCOHOL ON PREMATURE LABOUR

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SUMMARY

Prematurity is the most important cause of perinatal mortality and morbidity. Prevention of prematurity by proper antenatal care is of paramount importance. When preventive measures fail 9.5 percent alcohol infusion can effectively suppress premature labour.

In 70 percent cases the pregnancy was prolonged by 3 days and in 65 percent cases by more than one week. Mean gain in gestational days was 22.47 ± 20.52 and gestational age increased significantly ($P < 0.001$). Fortyfive percent patients reached maturity. The effect was more significant when cervical dilatation was 2 cms or less ($P < 0.05$) and number of contractions were less than 3 per 10 minute. No side or toxic effect was observed in any patient. Alcohol, as such appears to be a clinically effective and safe drug in preventing premature labour and deserves extensive clinical trials.

Introduction

The incidence of preterm birth can be reduced only by adequate prenatal care with active treatment of factors that predispose pregnant women to preterm labour. When preventive measures fail, pharmacological suppression of perterm labour is very important since significant decrease in neonatal morbidity and death can be achieved with addition of one or two weeks of intrauterine existence.

In the present study, we have tried to evaluate the efficacy of ethanol in inhibit-

ing uterine contractions on premature labour with special reference to factors like period of gestation, degree of cervical dilatation and number of uterine contractions occurring per ten minutes before administration of the drug. We tried to observe toxic/side effects of ethanol on the mother and baby both.

Ethanol has been shown to have an inhibitory effect on oxytocin release in the human beings (Fuchs and Wagner 1966). Mantell and Liggins (1970) have suggested that beside inhibiting the release of neurohypophyseal hormones, ethanol also has some direct action on myometrium. They concluded that inhibitory effect of ethanol

on pregnant uterus could be due to both, inhibition of oxytocin release and non-competitive antagonism of oxytocin on target organ, the mechanism, possibly being a reversible interaction of ethanol with calcium ions in the myometrial cells. Other possible modes of action are by stimulating the release of inhibitory substances such as catecholamines or by preventing synthesis or release of a myometrial stimulant such as prostaglandin (Fuchs and Fuchs, 1973).

Material and Method

80 cases were selected out of which 40 were controls. All patients were subjected to detailed history and examination. Necessary investigations were done. Selected cases had a gestation period between 20-36 weeks with regular uterine contractions at least one every ten minutes lasting for a minimum of 30 seconds and with cervical dilation upto 3 cms. Cases with ruptured membranes were also included. Patients bleeding actively or suffering from hyperthyroidism, diabetes mellitus, cardiac disease, chorioamnionitis or some other factor which contraindicated continuation of pregnancy were excluded from study.

In the study group 9.5% alcohol was given in the initial loading dose of 15 ml/kg/per hour for first two hours. This was reduced to 1.5 ml/kg/per hour for the next 12 hours and if contractions recurred within 10 hours after this infusion, second infusion was started but here the initial loading dose was reduced according to the following formula.

$$\text{Reloading dose in ml} = \frac{\text{Loading dose} \times \text{no. of hours since discontinuation}}{10}$$

The treatment was repeated again during the course of pregnancy whenever needed.

In the control group only bed rest and diazepam 10 mg I/M was given at the same time, when alcohol infusion was started in the study group. 5 mg of diazepam was given again after 6 hours.

In patients with intact membranes, our aim was to prolong pregnancy upto 37 weeks. In patients with ruptured membranes our aim was to prolong pregnancy for atleast 48 hours during which corticosteroids were administered in the form of injection decadron 4 mg every 8 hours upto total of 6 doses. These patients were given antibiotics in form of cap. Ampicillin 500 mg every 8 hours to minimize risk of chorioamnionitis.

Observation and Results

Mean age of patients of study group was 25.1 ± 3.59 years while it was 23.25 ± 4.53 years in the control group.

The gestational age at which drugs were started ranged between 20-36 weeks. The mean gestational age of study group was 31.1 ± 3.01 weeks and in control group was 29.3 ± 3.28 .

There was no relationship between age and parity of patients and incidence of prematurity while there was rise in no. of preterm births with declining socioeconomic status.

In our study, 70% of patients treated with 9.5% alcohol had prolongation of pregnancy by more than 3 days and 65% had prolongation of pregnancy for more than 1 week while with placebo therapy only 55% and 25% of cases had prolongation of pregnancy more than 3 day and 7 days respectively. Our results are in accordance with those of Fuchs et al (1967), who observed prolongation of pregnancy for more than 3 days in 67% patients and with those of Mehra and associates (1970)

TABLE - I
SHOWING PROLONGATION OF PREGNANCY IN DAYS IN CONTROL AND STUDY GROUP.

Sl. No.	No. of days gained	Study Group		Control Group		
		No.	%	No.	%	
1.	Less than 3 days	12	30	18	45	
2.	3 - 7	2	5	12	30	
3.	8 - 14	4	10	10	25	t = 5.46
4.	15 - 28	10	25	-	-	p < .001
5.	29 - 56	10	25	-	-	highly
6.	57 - 84	2	5	-	-	Significantly
Mean & SD		22.47 ± 20.52		4.4 ± 2.71		

who noted prolongation of pregnancy for more than 3 days in 68% of patients. Our results are in contrast to those of Graff (1971) according to whom prolongation of pregnancy beyond 3 days was seen in only 7% of cases. The mean gain in days with alcohol was 22.47 ± 20.52 days with maximum days of 70, whereas it was only 4.4 ± 2.71 days with maximum gain of 14 days in the controls (Table I). Our figures are lower than those of Fuchs et al (1967) who were able to prolong pregnancy with same drug for mean of 32 days.

suggested that ethanol is not effective in treating preterm labour. Fuchs et al (1967), Mehra et al (1970) and Graff (1971) did not include control patients in their study.

40% cases with alcohol therapy while only 5% of cases in the control reached maturity.

The mean gestational age at the time of delivery was more when 9.5% ethanol was used (36.05 ± 4.607 weeks) and it was less when placebo was used (30.1 ± 4.96 weeks).

TABLE - II
SHOWING PERCENTAGE OF CASES REACHING MATURITY

Sl. No.	Study Group			Control Group		
	Total cases	Cases reaching maturity		Total cases	Cases reaching maturity	
		No.	%		No.	%
1	40	16	40	40	2	5

Our study showed that ethanol was better than placebo for prolonging pregnancy for more than 3 days (70% versus 55%) and also for extending pregnancy beyond 1 week (65% versus 25%). These results are in contrast to those of Castern et al (1975) and Watring et al (1976) who

There was no significant increase in gestational age after treatment with placebo ($t = .838$ p .05 not significant) whereas by the use of alcohol gestational age at the time of delivery (36.05 ± 4.607 weeks) was significantly increased as compared to the gestational age at the time of admission

TABLE - III

SHOWING GESTATIONAL AGE WISE DISTRIBUTION (IN WEEKS) OF CASES AT THE TIME OF ADMISSION AND AT THE TIME OF DELIVERY IN STUDY AND CONTROL GROUP.

Sl. No.	Gestational age in wks.	Study Group		Control Group	
		At the time of admission	At the time of delivery	At the time of admission	At the time of delivery
1.	20 - 24	-	-	6	6
2.	25 - 28	4	2	6	6
3.	29 - 32	14 ^a	7	12	10
4.	33 - 36	22	10	16	14
5.	37 - 40	-	26	-	4
Mean & SD		31.1 ± 3.01 wks. t = 4.625 p < .001 highly significant	36.05 ± 4.607 wks.	29.3 ± 3.28 wks. t = .838 p .05 not significant	30.1 ± 4.96 wks.

(31.1 ± 3.01 weeks, t = 5.625 p < .001 highly significant (Table III).

9.5% ethanol is more effective when cervix was less than 2 cm dilated. Mean gain in days was 29.52 ± 19.04 days when cervix was less than 2 cm while it was only 8.21 ± 16.36 days when cervical dilatation was more than 2 cm. In cases with cervical dilatation 2 cm or less, 84.61% cases had prolongation of pregnancy for more than 7 days, 92.3% had prolongation of pregnancy for more than 3 days and 61.54% of cases reached maturity while in cases with cervical dilatation more than 2 cm, only

14.28% of cases had prolongation of pregnancy more than 1 week and 71.43% had prolongation of pregnancy for more than 3 days and maturity reached in only 14.28% of cases.

Fuchs et al (1967) have found ethanol to be less effective in cases in which cervix was more than 2 cm. dilated.

On comparing the effect of ethanol with placebo we found that the ethanol gain in days was statistically more than the days gained with placebo when cervix was 2 cm or less than 2 cm dilated (t = 3.936 p < .05 significant) but when drug

TABLE - IV

SHOWING PROLONGATION OF PREGNANCY FOLLOWING TREATMENT WITH ETHANOL IN RELATION TO CERVICAL DILATATION.

Cervical Dilatation	Total no. of cases	Cases having prolongation 3 days		Cases having prolongation 7 days		Cases reaching maturity	
		No.	%	No.	%	No.	%
≤ 2	26	24	92.3	22	84.61	16	61.54
> 2	14	10	71.43	2	14.28	2	14.28

was given in patients with cervical dilation more than 2 cm mean gain in days was not more than the mean number of days gained in patients of control group ($t = .908$ $p .05$ not significant).

From our study it is evident that alcohol is more effective when used in patients having uterine contractions with frequency of less than 3 per 10 min as compared to those with contraction frequency of more than 3 per 10 minutes.

In patients with ruptured forewater, ethanol could prolong pregnancy beyond 48 hours in 25% of cases while in control group the pregnancy continued beyond 48 hours in only 10% cases. Our results are comparable with Fuchs et al (1967) according to whom delivery was delayed by 24-48 hours in 44% cases. Caritis et al (1979) were able to prolong pregnancy in 11 out of 12 patients for at least 24 hours with ethanol.

TABLE - V
SHOWING PROLONGATION OF PREGNANCY IN STUDY AND CONTROL GROUP IN RELATION TO FREQUENCY OF CONTRACTIONS.

Frequency of contraction per 10	Total no. of cases	Cases having prolongation 3 days		Cases having prolongation 7 days		Cases reached maturity	
		No.	%	No.	%	No.	%
<3	20	20	100	16	80	14	70
≥3	20	12	60	8	40	4	20

Mean gain in days was 31.2 ± 19.49 days when frequency of contractions was less than 3 per 10 min. while it was only 13.75 ± 18.44 days when contractions were 3 or more than 3 per 10 min. In cases with frequency of contractions less than 3 per 10 min, 80% had prolongation of pregnancy for more than one week while all the cases had prolongation for more than 3 days and 70% of cases reached maturity while in cases with contraction frequency 3 or more than 3 per 10 min, only 40% had prolongation of pregnancy for more than one week and only 20% reached maturity.

When we compared the effect of ethanol with placebo we found that alcohol was better than placebo irrespective of frequency of contractions at the time of admission.

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