

Role of 17 α Hydroxy Progesterone Caproate (17OHPC) in the Prevention of Preterm Labor

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Abstract

Objective To evaluate the role of 17 α hydroxyprogesterone caproate (17OHPC) in the prevention of preterm labor in high risk asymptomatic patients with a history of preterm delivery.

Methods The study included 96 patients with a singleton pregnancy and having a prior preterm birth. They were divided in 2 groups, group I (treatment group) included 46 asymptomatic patients who were given 17OHPC injections starting from 16–20 weeks till 36 weeks and group II (control group) included 50 patients who did not receive any treatment.

Results The incidence of preterm delivery was found to be 6.9 %. The median gestational age at delivery was 36 weeks in group I and 33 W5D in controls. 50 % cases in group I and 80 % of controls delivered prematurely in the group with a prior preterm birth between 20–28 weeks.

Conclusion In patients who had a prior history of a preterm delivery the recurrence of a preterm birth was less in the treated group as compared to controls. The median gestational age at delivery was significantly higher in 17OHPC treated patients with history of earliest prior preterm delivery at 20–28 weeks.

Introduction

Reducing preterm birth, a major cause of morbidity and mortality, by timely intervention can reduce the emotional trauma to the mother and the financial burden on the cost of health care services. The WHO (1969) recommended that preterm infants are those delivered at a gestational age <37 completed weeks, irrespective of birth weight. The incidence of preterm birth remains high, i.e., 5–10 % [1]. Although many risk scoring systems have been devised, predicting a preterm birth is difficult. Prior preterm birth is a strong predictor of preterm delivery [2]. Although the pathogenesis of preterm labor is not well understood, progesterone withdrawal is theorized to play a part [3]. A multicentric randomized control trial conducted by the National institute of child health, Maternal fetal medicine units network demonstrated a significant (33 %) reduction in preterm birth with weekly injections of 17OHPC among women with a history of prior spontaneous preterm birth. Responding to the above findings, ACOG issued a committee opinion in Nov. 2003 [4] on the use of progesterone to reduce preterm birth in support of the use 17OHPC among women with a history of prior spontaneous preterm birth. The present study evaluates the role of 17OHPC in the prevention of preterm labor in high-risk patients.

Method

This is a prospective case control study carried out on 96 patients from Aug 2006 to Dec 2008 in J.N.M.C., Aligarh

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Table 1 Incidence of PPROM, indicated, and spontaneous births

GA (weeks)	Indicated	Spontaneous	PPROM
32–36	111	170	51
27–31	86	35	25
20–26	21	8	13
Total 520	218 (42 %)	213 (41 %)	89 (17 %)

Table 2 Gestational age in prior preterm delivery

GA (weeks)	Cases (<i>N</i> = 46)		Control (<i>N</i> = 50)	
	<i>N</i>	%	<i>N</i>	%
20–28	16	34.7	10	20
28–35	24	52.1	34	68
35–37	6	13.04	6	12
Mean \pm SD	29.4 \pm 4.3		30.5 \pm 3.6	

Table 3 Median gestational age at delivery in the current pregnancy

GA at earliest prior delivery (weeks)	Group	<i>N</i>	GA at delivery in current pregnancy	<i>P</i> value
20–28	Case	16	36 weeks 2 days	<0.05 Significant
	Control	10	33 weeks 2 days	
28–34	Case	24	32 weeks	>0.05 NS
	Control	34	35 weeks	
34–37	Case	6	37 weeks 5 days	>0.05 NS
	Control	6	35 weeks 5 days	

after approval from the ethical committee. The eligibility criteria included women with a singleton pregnancy between 16 and 20 weeks of gestational age and having a history of previous spontaneous preterm birth. Exclusion criteria were patients with fetal or uterine anomalies, twins, and patients with complications like PIH, APH, diabetics, PROM, etc. The patients were divided into two groups.

The treatment group (cases) included 46 asymptomatic patients with a prior preterm birth. They were given weekly IM injections of 17OHPC (250 mg) starting from 16 to 20 week of pregnancy till 36 weeks. The control group included 50 high-risk patients with a prior preterm birth who had not received any medication. These patients were those who presented with preterm labor or came in late gestational age.

The outcome of pregnancy and the neonatal outcomes were studied.

Results

The incidence of preterm deliveries in our institution was found to be 6.9 % with 520 patients out of 7,429 patients

Table 4 Relationship of gestational age in earliest previous preterm birth and risk of preterm birth in current pregnancy

GA at earliest prior delivery (weeks)	Group	<i>N</i>	% of PTD	<i>P</i> value
20–28	Case	16	50 (8)	NS (<i>t</i> = 1.1)
	Control	10	80 (8)	
28–34	Case	24	33.3 (8)	NS (<i>t</i> = 1.1)
	Control	34	53 (8)	
34–37	Case	6	33.3 (2)	NS (<i>t</i> = 0.85)
	Control	6	66.6 (4)	

delivering preterm. Table 1 shows that among all preterm births, 42 % were indicated preterm births, 41 % were spontaneous preterm births, and 17 % were due to PPROM.

Table 2 compares the gestational age in prior preterm delivery in the treatment and control groups. It shows that the mean gestational age of prior preterm delivery was 29.4 \pm 4.3 weeks in the treatment group (cases) and 30.5 \pm 3.6 weeks in the control, which was statistically similar.

Table 3 shows the median gestational age at delivery in the current pregnancy according to the treatment and the gestational age at the earliest prior preterm birth.

It was observed that the median gestational age at delivery was 36 weeks 2 days in the cases and 33 weeks 5 days in the controls with an earlier spontaneous preterm birth at 20–28 weeks. The cases in this were found to deliver at a significantly higher gestational age than the controls.

Table 4 shows that 50 % of the cases and 80 % of the controls delivered prematurely in the group with a prior preterm birth at 20–28 weeks. In the group with a prior preterm birth at 28–34 weeks, 33.3 % of the cases and 53 % controls delivered preterm. Although a numerically higher percentage of preterm delivery was observed in the controls, preterm delivery was not found to be statistically different between the cases and controls. The adverse effects of the drug in the cases were pain (43.4 %), swelling at the site of injection (13 %), urticaria (4.34 %), and injection site nodule (4.34 %). The percentage of infants weighing <2.5 kg was 30.4 % in the treatment group versus 44 % in the controls. There was no statistical difference in the Apgar scores, neonatal morbidity, and mortality in the two groups.

Discussion

The incidence of preterm delivery in our hospital was 6.9 % as opposed to the 5–10 % reported by Chabra and Patil [1].

Bloom and Yost [5] have identified previous preterm births as the risk factor with the highest predictive value for

recurrence. In our study, it was found that the median gestational age was significantly prolonged in the cases as compared to the controls with the earliest prior delivery at 20–28 weeks. Spong et al. [6] in their study showed that there was a significant increase in the median gestational age at delivery in the treated group with the earliest prior spontaneous preterm births at 20–27.9 weeks and 28–33.9 weeks. Meis and Klebanoff [7] reported that the incidence of preterm delivery (<37 weeks) was 36.3 % in the progesterone-treated group as compared to 54.9 % in the placebo group ($P < 0.001$). Meis et al. also reported that the most common side effect was soreness (34.2 %), swelling (14 %), itching (11.3 %), and bruising (6.7 %). The reported rate of congenital anomalies in the treated group was also found to be consistent with that in the general population.

A recent publication of two randomised control trials [8] shows that current evidence supports the use of 17OHPC treatment begun early in the second trimester and continued weekly till 36 weeks for women with a previous history of preterm labor. At present, no evidence exists in using 17OHPC in women with multiple gestations, a short cervix, or other risk factors.

Conclusion

From the present study, it can be concluded that in patients who had a prior history of preterm delivery, the recurrence

of a preterm birth was less in the treated group as compared to the controls. The median gestational age at delivery was significantly higher in 17OHPC-treated patients with a history of the earliest prior preterm delivery at 20–28 weeks. The limit of our study is the small sample size; so, large trials of this kind are required before conclusions can be drawn about a clinical advantage.

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