Journal of Cardiovascular Disease Research

ISSN:0975-3583,0976-2833 VOL14,ISSUE05,2023

Original Research Article

To study the epidemiology of pre-term labour and its relation with parity

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Abstract:

Background &Method: The aim of the study is to study the epidemiology of pre-term labour and its relation with parity.Weekly injections of micronized progesterone or vaginal micronized progesterone suppository of 100 mg. daily till 35 weeks starting from 28 weeks completed or whenever patients comes after that.

Result: In present study out of 86 cases 4 were defaulters. The incidence of preterm labour in study group was 19.5 % that is out of 82 cases 16 had preterm labour. Out of 96 controls 32 had preterm labour giving an incidence of 33.33%.Maximally cases and controls belonged to parity 3 (34.1% and 38% respectively) showing that the risk of preterm labour is maximum in patients with parity 3..The chi-square statistic is 5.269. The *p*-value is < .049809. The result is significant at $p < .05$.

Conclusion:A lot of dilemma remains in diagnosis and management strategy of preterm labour. Despite the newer technologies and drugs the rate of preterm birth has been increasing in past few decades managing a preterm neonate has a great financial load on world economy. So the studies are ongoing to find a best way to prevent preterm labour. At the recommended dose, micronized progesterone is a safe, effective, economical, minimally teratogenic and easily available to general public and it is FDA approved.

Keywords: epidemiology, parity & preterm labour.

Study Designed: Case - Control Study.

1. Introduction

In 1935, The American Academy of Pediatrics[1] defined prematurity as a live – born infant weighing 2500 or less (Cone, 1985). The word health organization[1] in 1961 added gestational age as a criteria of premature infants, defined as those made between low birthweight (2500g or less) and prematurity (37 weeks or less).

American College of Obstetricians and Gynecologists (1995)[1] suggested that preterm birth be defined as those infants delivered prior to the completion of 37 weeks.The uterine muscle can be influenced by many different compounds including hormones (e.g. oestrogens progesterone catecholamines, oxytocin, prostaglandins and cytokines platelet activating factor), ions and even gases[2]. Common feature in the mechanisms of action of these different agonists is that their effects depend on the binding to specific receptors on myometrial cell membranes and the transmission of information to an effector system within the cell (an effector can be an enzyme that generates second messengers, e.g. certain voltage-sensitive calcium and potassium channels). The link between the receptor and the effector is usually a regulator GTP-binding protein or "G protein" (the proteins were discovered for their ability to bind and hydrolyse guanosine triphosphate) which is involved in signal transduction across the plasma membrane[3].

The overall uterine effect of estrogen is to increase contractility and responsiveness to other uterotonic stimuli. Circulating estrogen levels increase throughout pregnancy. It is now generally agreed in most studies that maternal estrogen levels increase in the last few weeks prior to parturition[4]. Estrogens increase production of uterine prostaglandins which are an important uterine stimulant. Additionally, in subprimate species, estrogens have also been demonstrated to induce and increase myometrial oxytocin receptors[5].

Preterm birth can be further classified as spontaneous pre-term birth or medically indicated (iatrogenic) preterm birth. Pathways to spontaneous preterm birth include preterm labor, preterm premature rupture of membranes, and second trimester spontaneous pregnancy loss. Approximately two- thirds of all preterm deliveries are spontaneous[6]. Risk factors for spontaneous preterm birth include prior spontaneous preterm birth, short cervix, non-Hispanic blackrace, short inter-pregnancy interval, multiple gestations, and uterine anomalies. Prior spontaneous preterm birth is the strongest risk factor, with recurrence rates ranging from 15% to 50% depending on the number and gestational age of prior preterm deliveries[7].

ISSN:0975-3583,0976-2833 VOL14,ISSUE05,2023

2. Material & Method

High risk cases seen in OPD and admitted in emergency in Department of Obstetrics and Gynaecology at Tertiary Care Centres, of M.P.
Weekly injections of micronized progesterone or vaginal micronized progesterone suppository of 100 mg. daily till 37 weeks starting from 28 weeks completed or whenever patients comes after that.

Inclusion criteria for cases:

1. Singleton pregnancy.
2. History of either a preterm labour, prophylactic circlage, a uterine malformation or currently suffering from premature pains.
3. Gestational age from 28 weeks 0 day to 37 weeks 0 day based on clinical information and evaluation of first ultrasound.

Exclusion criteria for cases:

1. Multiple pregnancy
2. Major fetal anomaly
3. Allergy to progesterone

3. Results

TABLE 1: DISTRIBUTION ACCORDING TO AGE

Age Groups (in years)	No. of patients (Control)	No. of patients (Case)
20-23	11	21
23-26	41	37
26-29	38	23
29-32	06	01

The chi-square statistic is 8.4777. The *p*-value is .037106. The result is significant at $p < .05$, showing that maximum no. of cases of preterm labour at age group of 23-26 year.

TABLE 2: INCIDENCE OF PRETERM LABOUR IN CASE & CONTROL GROUP

	Total Number	Preterm Labour	Percentage
Controls	96	32	33.33
Cases	82	16	19.5

In present study out of 86 cases 4 were defaulters. The incidence of preterm labour in study group was 19.5 % that is out of 82 cases 16 had preterm labour. Out of 96 controls 32 had preterm labour giving an incidence of 33.33%.
After comparing the results by Chi-Square test it was found that the difference between controls and cases was significant with value of Chi-Square being 4.68 giving $p<0.05$ proving that the progesterone definitely has a beneficial role in prevention of preterm labour. The relative risk is 1.41 and 95% confidence interval is 1.31 to 1.51

TABLE 3: DISTRIBUTION CONTROL ACCORDING TO PARITY

Parity	No. of patients (Control)	Patient went into preterm labour	No. of patients (Case)	Patient went into preterm labour
1	02	01	13	01
2	05	01	14	01
3	35	12	28	10
4	27	08	16	02
5	14	07	09	01
6	13	07	02	01
TOTAL	**96**	**32**	**82**	**16**

Maximally cases and controls belonged to parity 3 (34.1% and 38% respectively) showing that the risk of preterm labour is maximum in patients with parity 3. This finding is statistically significant with p value is <.05

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On comparing the overall rate of preterm labour patients in control and case groups, the chi-square statistic is 5.269. The *p*-value is <.049809. The result is significant at $p < .05$.This proves that on increasing parity rate of preterm labour increases and progesterone play a beneficial role in prevention of preterm labour .

4. Discussion

Causes of preterm birth are complex and the pathophysiology that triggers preterm birth is largely unknown, however, contributing maternal, foetal and placental predisposing factors have been identified. The most common of these include: antepartum haemorrhage or abruption; mechanical factors such as uterine over distension and cervical incompetence; hormonal changes; and,bacterial infection and inflammation[8].

Over the past 20 years the access to assisted reproduction technology(ART) in many high income countries has contributed to the rise in the number of multiple births and an overall increase in the rates of preterm delivery. Infants born from multiple pregnancies are more likely to be born preterm due to spontaneous labour or premature rupture of membranes (PROM), or as a result of maternal conditions such as pre-eclampsia or foetal disorders[9].

Changes to policies which limit the number of embryos implanted as part of ART have led to a decline in the number of preterm births due to assisted fertility[10].

Epidemiologic studies have identified preterm birth risk factors as maternal age of less than 17 years or more than 35 years, being underweight, having an overweight pre-pregnancy body mass index, and short stature. Preterm birth rates vary geographically and within ethnic origins, with LMIC consistently having higher rates[11]. Physical and psychosocial stress and smoking have also been associated with higher preterm risk as does a previous preterm birth.

Preterm birth defined as less than 37 completed weeks encompasses a wide gestational age range with rates varying across countries.The WHO subcategories of ‘extremely preterm’, ‘very preterm’ and ‘moderate or late preterm’ are recommended to improve comparability of preterm birth data in relation to immunisation.

5. Conclusion

A lot of dilemma remains in diagnosis and management strategy of preterm labour. Despite the advent of newer technologies and drugs the rate of preterm birth has been increasing in past few decades and managing a preterm neonate has a great financial load on family and world economy. So the studies are ongoing to find a best way to prevent preterm labour.At the recommended dose, micronized progesterone is a safe, effective, economical, minimally teratogenic and easily available to general public and it is FDA approved.

6. References

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