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A Case Control Study Of Association Of UrogenitalInfections As A Risk Factor For Spontaneous Preterm Labour.

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ABSTARCT

Purpose Preterm labor is a leading cause of neonatal morbidity and mortality. Ascending lower genital tract infection leads to preterm labor and adverse pregnancy outcomes. This prospective case-control study was performed to see the association between preterm labor and urogenital infections. To find out the association of urogenital infection as a risk factor for spontaneous preterm delivery. A total of 100 women were observed for urogenital infections and their association with preterm labor. Case Group I included 50 women with preterm labor after 28 weeks and before 37 completed weeks of gestation with or without rupture of membranes. Control Group II included 50 women at completed or more than 37 weeks of gestation with or without history of preterm labor, matched to the case group with respect to age and parity. Midstream urine was sent for cytology and culture sensitivity. Samples from posterior fornix of vagina were taken with two sterilized swabs under direct vision using Cusco/Sims speculum before first vaginal examination and were studied for gram stain characteristics and culture sensitivity by standard methods. Microorganisms isolated on culture were noted, and antibiotics were given according to sensitivity. Data collected were analyzed according to the groups by chi square test and Fishers Exact categorical variables. Continuous variables were analysed using unpaired t test. In my study, urogenital infection was seen in 18 women in Case Group I (36 %) compared with 6 women in Control Group (12 %), and the difference was statistically significant (p 0.0425). Recognizing and treating the women having urogenital infections at a stage, when it has not become clinically evident, will decrease the percentage of women going into preterm labor and will improve the perinatal outcome.

Keywords: Urogenital infection, Preterm labor, Case Control study.

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INTRODUCTION

Prematurity is the condition where the fetus enters the extrauterine life with biological immaturity. Maturation is defined as the process of completing full development or growth [1]. The embryo and fetus mature intrauterine until organ systems support the extrauterine life. Thus, the degree of maturity is the foremost and main determinant for morbidity and mortality of the neonate. Born too soon babies are more prone for neurological disability, learning disabilities, injury to organs, death, chances of chronic illness and lifetime disability than the term newborns. Since there is no good direct measure for degree of maturity, gestational age calculated during pregnancy is used as a proxy measure of it [2]. Preterm birth is a main cause of important long term loss of human potential among survivors worldwide. Complication of prematurity is the single major direct cause of neonatal negative sequel. Prematurity is the second most common aetiology of under-5 mortality, the first being pneumonia. Being born too soon also increases the baby's risk of mortality due to other reasons, mainly from neonatal sepsis [3]. Prematurityis found to be a risk factor in at least half of all neonatal deaths. Underlying these differences in growth are the metabolic implications of being born preterm. When comparing those born preterm to those born at term, preterm individuals tend to have lower insulin sensitivity and higher blood pressures, even into their 20s. Associations between being born preterm and subsequent diabetes and cardiovascular disease have also been identified [4]. These findings seemed to be related to catch-up growth, which means that correcting slow growth may not be without consequences. Of all the health outcomes affected by being born preterm , he moststriking example of the risk comes from a recent study on long term mortality risk for these infants. Following a cohort in Sweden of births occurring between 1973-1979, the authors found that not only were patients born preterm more likely to die in early childhood (age 1-5 years)but that this risk is resurfaced at 18-36 years of age. Deaths in early adulthood were most often from respiratory, endocrine and cardiovascular disorders. This was independent of fetal growth and maternal risk factors with the adjusted hazard ratio of 0.96 for eachadditional increased week of gestation. Even late preterm infants were at risk with those born 34-36 weeks GA having a hazard ratio of 1.31 compared to those born at term (37-42 weeks) [5]. This, suggests the potential importance of any extension in GA at birth that can be achieved through preventative measures. These health effects can extend to the next generation. Individuals born preterm are less likely to reproduce and of the women that do, they are more likely to have preterm infants who are at a greater risk of dying during infancy. This fact is especially poignant when considering the current racial disparities in birth outcomes [6].

MATERIALS AND METHODS

this Case control study was conducted at Department Of Obstetrics And Gynecology, Dhanalakshmi Srinivasan Medical College Siruvachur, Perambalur District, Tamil Nadu, India in the month of December 2022. Written informed consent was obtained from the women explaining it to them in their language they bestunderstand. Minimum sample size of women with 7 % prevalence of Genito urinary infections among antenatal cases not having preterm labor and 30 % prevalence of Genito urinary infections among antenatal cases in preterm labor, with a confidence limit of 95 % and a power of 80 was calculated to be 52 in each group using SPS statistical software package (version 17). Inclusion criteria: Only women with singleton pregnancy were included in this study. Case group I included the antenatal patients who was admitted in the labor ward with threatened preterm labor and in preterm labor with or without rupture of membranes after 28 weeks and before 37 completed weeks of gestation. Control group II consisted of antenatal women visiting antenatal Outpatient department of the hospital for routine antenatal check-up at completed or more than 37 weeks of gestation with or without history of preterm labor and matched to the case group with respect to age(teenage pregnancy, pregnancy at 20–30 years, and pregnancy after 30 years) and parity (primigravida or multigravida).Exclusion criteria: Women with twin pregnancy or higher-order pregnancy, and women with antepartum hemorrhage were excluded from the study. Preterm labor was documented according to ACOG criteria (1997) as four uterine contractions in 20 min or eight in 60 min plus progressive change in the cervix; cervical dilatation greater than 1 cm; and cervical effacement 80 % or greater at gestation 37 completed weeks.Threatened preterm labor was described as four uterine contractions in 20 min or eight in 60 min plus cervical dilatation less than 1 cm; and cervical effacement less than 80%. Leaking, i.e., rupture of membranes was diagnosed by per speculum examination and confirmed by litmus paper (change of colour from red to blue). All women were evaluated by detailed history compiled with special emphasis on previous history of preterm labor, previous bad obstetric history and urogenital infections. Gestational age was calculated from date of last menstrual period using Naegeles formula or by first ultrasound in the first trimester of

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pregnancy.All women underwent general physical, systemic, and obstetrical examinations. Samples from posterior fornix of vagina were taken with two sterilized swabs under direct vision using Cusco/Sims speculum before first vaginal examination and were studied for gram stain characteristics and culture-sensitivity by standard methods. Mid-stream urine sample was sent for cytology and culture-sensitivity. Sample for aerobic culture sensitivity was sent immediately to the Microbiology Department of the hospital and taking all aseptic precautions; these samples were inoculated on blood agar and MacConkey's agar using semi-quantitative method of inoculation. The culture plates were incubated at 37-degree Celsius for a duration ranging from 24 to 48 hours. Isolates were identified by standard methods. Women admitted with preterm labor were put on tocolytics (where required), or steroids therapy (\34 weeks of gestation), and antibiotics (cephalosporins) were started in women with ruptured membranes. Reports of the urine and high vaginal swab cultures were collected and recorded. Antibiotic therapy was started or changed according to the sensitivity reports. Data collected were tabulated and analysed.

Data Analysis

Descriptive statistics was done for all data and were reported in terms of mean values and percentages. Suitable statistical tests of comparison were done. Continuous variables were analysed with the unpaired t test... Categorical variables were analysed with the Chi-Square Test and Fisher Exact Test. Statistical significance was taken as $P < 0.05$. The data was analysed using SPSS version 16 and Microsoft Excel 2022.

RESULTS

Table 1: Gestational Age

Gestational Age - Groups	Cases	Controls	Cases %	Control %
≤ 28 weeks	2	0	4.00	0.00
29-32 weeks	13	0	26.00	0.00
33-36 weeks	35	0	70.00	0.00
37-40 weeks	0	50	0.00	100.00
Total	50	50	100	100

Table 2: BMI

Pregnancy BMI	Cases	Controls	Cases %	Control %
Underweight	7	9	14.00	18.00
Normal	31	39	62.00	78.00
Overweight	11	2	22.00	4.00
Obese	1	0	2.00	0.00
Total	50	50	100	100
P value Fishers Exact Test			0.0297	

Table 3: Urine Culture

Urine Culture	Cases	Controls	Cases %	Control %
Positive	8	2	16.00	4.00
Negative	42	48	84.00	96.00
Total	50	50	100	100
P value Fishers Exact Test			0.0437	

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Table 4: Organism Isolated In Urine

Organism Isolated in urine	Cases	Controls	Cases %	Control %	P value Fishers Exact Test
Escherichia coli	5	2	10.00	4.00	0.2739
Enterococcus	1	0	2.00	0.00	0.5000
Stapylococcus aureus	2	0	4.00	0.00	0.2475
Nil	42	48	84.00	96.00	
Total	50	50	100	100	

Table 5: High Vaginal Swab

High Vaginal Swab	Cases	Controls	Cases %	Control %
Positive	14	5	28.00	10.00
Negative	36	45	72.00	90.00
Total	50	50	100	100
P value Fishers Exact Test			0.0245	

Table 6: Organism Isolated in HVS

Organism Isolatedin HVS	Cases	Controls	Cases %	Control %	P value Fishers Exact Test
Escherichia coli	4	3	8.00	6.00	0.7180
Enterococcus	7	2	14.00	4.00	0.0952
Stapylococcusaureus	3	0	6.00	0.00	0.1212
Nil	36	45	72.00	90.00	
Total	50	50	100	100	

Table 7: Presence of urogenital infection

Presence of Urogenital Infection	Cases	Controls	Cases %	Control %
Both +ve	4	1	8.00	2.00
Urine +ve / HVS -ve	4	1	8.00	2.00
Urine -ve / HVS +ve	10	4	20.00	8.00
Both -ve	32	44	64.00	88.00
Total	50	50	100	100

DISCUSSION

In my study, of the case group 50 women were in 21–30 years of age group and no woman in <21 yrs. 60% (30/50) of these were primigravida, multiparous 36% (18/50) and women with previous one abortion is 4% (2/50). In control group of 50 women 48 belonged to 21 to 30 yrs. age group and 2 of 50 <21 years of age. The control group contained 54% (27/50) of prime gravida, 38% (19/50) were multigravida and 8% (4/50) with previous one abortion, there was no statistically significant difference in relation to age distribution between cases group (mean=26.50, SD=1.85) and control group (mean=25.38, SD=2.07) witha p value of <0.05 as per unpaired t test. And also, no statistically significant difference in relation to parity status between cases group (majority primi – 60.00%) and control group majority primi – 54.00% with a p value of <0.05 as per Fishers exact test.[5] Therefore we fail to reject the null hypothesis that there is no difference in age distribution between the study groups. Case group has 9 unbooked women compared with control group which was statistically insignificant (P 0.2679). There was no statistical difference (P 0.6805) in the socioeconomic status of the two groups. In the case group 33 women and in control group 32 women belonged to upper middle and lower middle class of socioeconomic scale. 7 women in my study were of lower socioeconomic class. [6]No Statistical significance of age, parity, booking status and employment status was not noted in my study.There is a statistically significant difference in relation to pregnancy BMI status between cases group (majority

normal pregnancy BMI – (62.00%) and control group (majority normal pregnancy BMI – 78.00%) with a p value of <0.05 as per Fishers exact test. Therefore we reject the null hypothesis that there is no difference in pre pregnancy BMI status between the study groups[7]. The incidence of overweight and obese category of pre pregnancy BMI was significantly more in cases group compared to control group by a percentage difference of 20.00 percentage points (83% higher). This difference is significant with a p-value of 0.0297 as per Fisher's exact test. Past history of preterm labor or abortion in previous pregnancy was seen in 20.1%) multigravida in Case group compared with 6.22% in Control group showing a significant association with p value of 0.0411 ofthe past history of abortion or preterm labor and the women going into preterm labor in the present pregnancy [8]. My preterm group showed urinary tract infection in 16% and genital tract infection in 28%, while 4 women had both cultures positive which is comparable to the observations by Chhabra and Patil. Commonest microorganism isolated in urine culture was E coli. and that in high vaginal swab was Enterococcus faecalis. In control group, urinary tract infection was seen in 4%, positive high vaginal swab culture in 10% and both in 2.1 % women [9]. In the case group, overall urinary tract infection was detected in 16.38% (8/50) which was 3.3 times more than that in the control group (5.77%, 2/50). This shows that women in preterm labor had 3.3 times more incidence of urinary tract infection than their counterparts with termpregnancy [10].

CONCLUSION

Vaginal infection was 2.80 times more in women with preterm labor compared to those in control group. And urinary infection is 4 times higher in women with preterm labour compared to those in control group, which indicates a significant association of urogenital infections in preterm labor. Urogenital infections contribute significantly to the preventable causes of preterm labor. We recommend that women coming for first antenatal check-up should be investigated for the presence of asymptomatic genitourinary infections. Making early diagnosis of urogenital infections and treating them adequately with the antimicrobials will go a long way in decreasing the incidence of preterm labour, preterm births and associated neonatal and maternal morbidities.

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