

Original Article

A STUDY ON BACTERIOLOGICAL PROFILE OF GENITAL TRACT IN PREGNANT MOTHER PRESENTING WITH AND WITHOUT PREMATURE RUPTURE OF MEMBRANE IN A TEACHING HOSPITAL OF WEST BENGAL

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ABSTRACT

Background: Premature rupture of membrane (PROM) is a condition with spontaneous rupture of foetal membranes after 37 completed weeks but before onset of true labor pain. [1] PROM occurs in approximately 1-3% of all pregnancies and 30-40% causes of all preterm labor [2]. PROM mostly has variety of causes but many believe that intra uterine infection is one of the most important events of the cause.

Methods: Patient was asked to lie down on examination table in lithotomy position. Then perineal area and vagina is cleansed with sterile normal saline. Sim's speculum is positioned in posterior vaginal wall and posterior lip of cervix was held by vulsellum forceps, then sterile cotton swab stick was introduced into the posterior fornix and two high vaginal swab was collected with all septic precautions.

Result: A total of 71 pregnant women with gestational age 37 weeks or more complicated by PROM along with 71 pregnant women with gestational age 37 weeks or more undergoing normal labor, who fits the inclusion criteria were evaluated during a period of 1 year attending the emergency room and labor room of OBGY Department in College of Medicine and J.N.M Hospital, Kalyani Nadia.

Conclusion: Present study was conducted at the Department of Microbiology, College of Medicine & J.N.M Hospital, Kalyani (Nadia) W.B between June 2018 to June 2019 where high vaginal swabs from 71 patients with PROM and 71 from without-PROM were taken for bacteriological study. Among 71 samples from PROM cases 39 samples showed growth and 32 samples showed no growth. Among 71 samples of NON-PROM cases 54 samples showed growth and 17 samples showed no growth.

Keywords: PROM, Intrauterine Infection, Preterm Labor

INTRODUCTION:

Premature rupture of membrane (PROM) is a condition with spontaneous rupture of fetal membranes after 37 completed weeks but before onset of true labor pain.¹ PROM occurs in approximately 1-3% of all pregnancies and 30-40% causes of all preterm labor.² PROM mostly has variety of causes but many believe that intra uterine infection is one of the most important events of the cause. Various studies have

established the fact that the micro-organisms present in birth canal during prolonged ruptured membrane can cause infection to mother and newborn and can be a reason of fetal as well as maternal morbidity and mortality.³ PROM induces labor within 24 hours. If rupture of fetal membranes happens before term, then labor can be delayed up to a week or more. As the time between membrane rupture and onset of labor increases the chances of infection also increases. The most important symptom of PROM is leaking of clear fluid from vagina. It may be a sudden, large gush of clear fluid or it may be slow, constant trickle of clear fluid. The complications of PROM are infection to mother, newborn and poor fetal outcomes. The infectious possibilities associated with PROM are chorioamnionitis 30%, endometritis 10%, abruptio placentae 4% - 7% and increase in operative deliveries which again increases the chances of primary and secondary hemorrhage.⁴ The amnionitis risks the fetus for bloodstream infections. A study said that gram positive infections are predominant in near term or term babies but gram-negative organisms are cause for preterm fetal infections. A study conducted in Christian Medical College & Hospital, Vellore. They found that infant with clinical signs of sepsis of those, who were born to mothers with premature rupture of membrane for more than 24 hours, are by *Escherichia Coli*, *Enterococcus fecalis*, *Klebsiella sp*, etc.⁵ A study in the department of Obstetrics & Gynaecology, University of Florida, USA, found the antibiotic therapy for PROM was associated with decrease in the rate of endometritis and a low chance of neonatal sepsis but and increasing the trend of gram negative and ampicillin resistant organisms causing neonatal sepsis.⁶ Treatment decisions in case of PROM is difficult because risk of infection to mother and fetus increases with the length of time from rupture to delivery. The baby has to be delivered as early as possible to avoid the serious risks. Researches are being done to know if antibiotics should be given prior to any symptoms of infection to avoid the development of infection. To overcome these above problems the present study was conducted with the aim to save the mother and her newborn from life threatening outcomes in case of PROM. To know the bacteriological profile from high vaginal swab in PROM case mothers comparing it with normal labor undergoing mothers and the antibiogram of those isolates.

MATERIALS AND METHODS

The was done at labour room, Dept of OBGY in College of Medicine and JNM Hospital Kalyani Nadia. Duration of the study was one year for research and six months for analysis. It was an observational, prospective study. Pregnant mother presenting with premature rupture of membrane fulfilling the inclusion criteria i.e. uncomplicated pregnancies of any gravida more than 37 completed weeks of pregnancy with premature rupture of membrane admitted in labour room of JNM Hospital on Tuesday, Wednesday, Friday and Saturday between 10 AM to 10 PM were included as case. Age and gestational age matched pregnant mother without premature rupture of membrane were included as control. Exclusion criteria were labour cases <37 weeks of gestation, previous digital examination of genital tract before presentation, complicated pregnancies like multiple pregnancies, malformed foetus, preeclampsia or eclampsia, antepartum haemorrhage, diabetes mellitus, active vaginal bleeding, fever, already received antibiotics for PROM, unwilling cases. The study population were categorized into two groups. **Group I:** All PROM cases admitted through outdoor and emergency to labour room in Dept. of OBS and GYNAE in JNM Hospital. Diagnosis of PROM depends on history of sudden gush of fluid with continued leakage and the visualization of pooling of liquor in posterior fornix after sterile speculum examination. **Group II:** age and gestational age matched pregnant women admitted through outdoor and emergency to labor room without PROM. The measurement of outcomes was done by detection of bacteria isolates of genital tract and their sensitivity pattern. The Sample size was calculated as; $n = (1.96)^2 \times p \times q / E^2$, taking standard error (E) = 7%, Prevalence = 10%, $n = 70.53$ i.e., 71. 71 samples for group I and 71 samples for group II will be taken for this study. Patients were selected as per inclusion and exclusion criteria and grouped as group I and group II. Two high vaginal swabs taken aseptically after speculum examination using Sim's posterior vaginal wall retractor and vulsellum forceps. Patient's detail and related data was filled in each case in case proforma which includes, i. identification of patient (name, age, address, registration ID), ii. Presenting

complaint, iii. Gestational age, iv. Onset and duration of discharge, v. active discharge present or not etc. Every patient was verbally explained in their own language about the procedure of sample collection and accordingly the duly signed consent forms were obtained. Patient was asked to lie down on examination table in lithotomy position. Then perineal area and vagina is cleansed with sterile normal saline. Sim’s speculum was positioned in posterior vaginal wall and posterior lip of cervix was held by vulsellum forceps, then sterile cotton swab stick was introduced into the posterior fornix and two high vaginal swab was collected with all septic precautions.

RESULTS

A total of 71 pregnant women with gestational age 37 weeks or more complicated by PROM along with 71 pregnant women with gestational age 37 weeks or more undergoing normal labor, who fits the inclusion criteria were evaluated during a period of 1 year attending the emergency room and labor room of OBGY Department in College of Medicine and J.N.M Hospital, Kalyani, Nadia.

Table.1A. Age distribution in patients with PROM.

Age group	Frequency	Percentage
17-20 yrs	21	29.6
21-25 yrs	35	49.3
>25 yrs	15	21.1
total	71	100.0

Table. 1A shows relationship between age and patients with PROM. It shows that out of 71 total samples taken from PROM patients, incidence of PROM is common in the age group of 21-25 years (49.30%) and less in >25 years (21.10%).

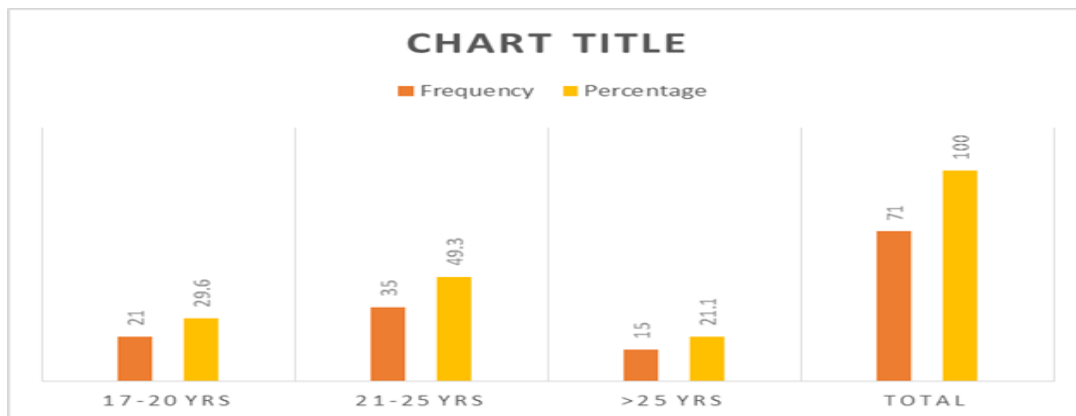


Table.1B Age distribution in patients without PROM.

Age group	Frequency	percentage
17-20 yrs	10	14.1
21-25 yrs	42	59.2
>25 yrs	19	26.8
total	71	100.0

Table. 1B shows that out of 71 total samples taken from patients without PROM, the highest number of patients belong to 21-25 yrs of age i.e. 59.2%.

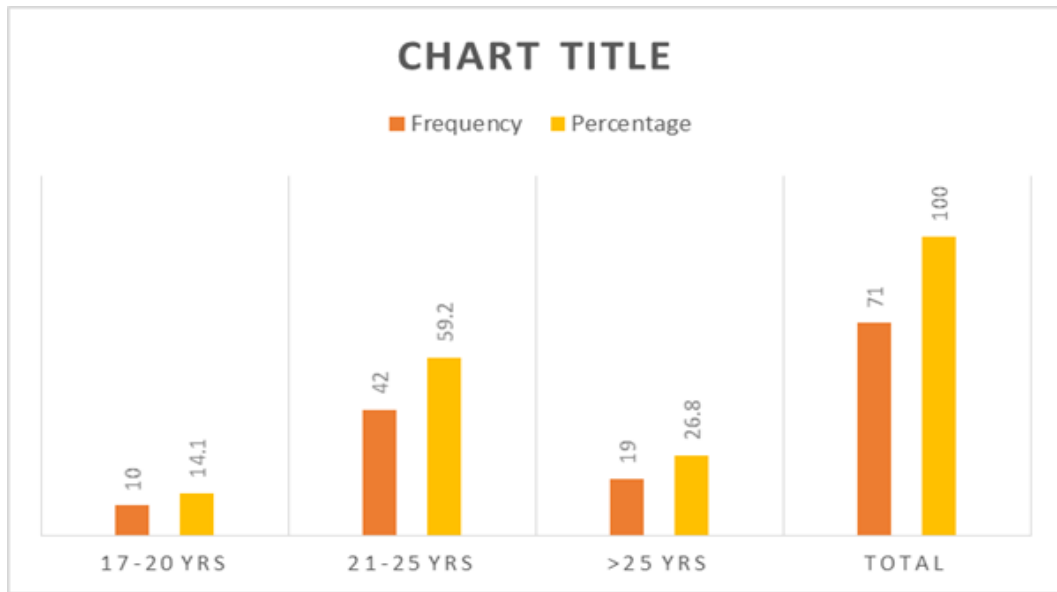


Fig. 2 Age distribution in patients without PROM

Table.1C. Relation between culture results and age in patients with PROM.

Age group	Culture positive	Culture negative	total
17-20 yrs	8	13	21
21-25 yrs	22	13	35
>25 yrs	9	6	15
total	39	32	71

Chi-square value = 3.44. p value = 0.17 (p value significant taken as 5%)

Table.1C shows relationship between age and culture results in patients with PROM. Out of 71 total samples taken the highest frequency for culture positive results were from age group of 21-25 yrs. According to the p value = 0.17, shows that there is no significant relation between age and culture positivity for high vaginal samples in cases of PROM.

Table. 2A Distribution of duration of leakage in PROM samples.

Duration	Frequency	Percentage
6-12 hrs	22	31.0
13-18 hrs	33	46.5
19-24 hrs	16	22.5
total	71	100.0

Table. 2A shows the frequency distribution and duration of leakage in cases of PROM showing the maximum number is from the leakage duration between 6-12 hrs.

Table.2B Frequency distribution of duration of labor in cases of without PROM.

Duration of labor	Frequency	Percentage
1-4 hrs	54	76.1
4-8 hrs	17	23.9
total	71	100.0

Table.2B shows the frequency of samples in cases without PROM was highest in the duration of 1-4hrs of labour onset.

Table.2C Relation between duration of PROM and culture positivity in PROM

Duration of PROM	Culture positive	Culture negative	Total
6-12 hrs	14	8	22
13-18 hrs	14	19	33
19-24 hrs	11	5	16
Total	39	32	71

Chi square value = 3.99, p value = 0.13 (p value significant taken as 5%)

Table 2C shows that highest frequency of culture positive PROM samples falls in the duration of 6-12hrs and 13-18hrs of PROM. And p value is showing no significant relation between duration of PROM and culture positivity of PROM high vaginal swab samples.

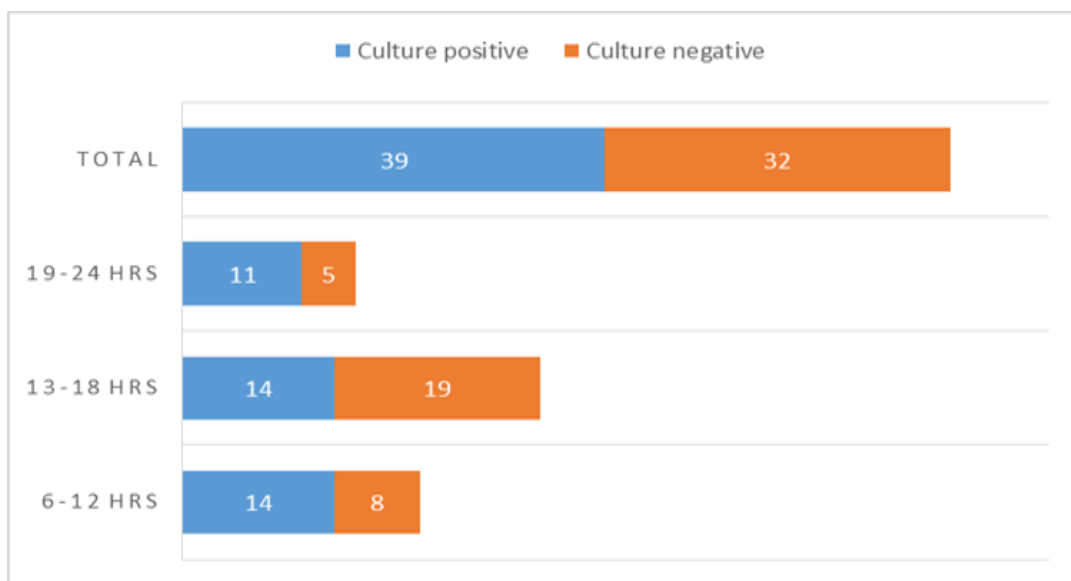


Fig.4 Relation between duration of PROM and culture positivity in PROM

DISCUSSION

The normal development, structural integrity and function of fetal membranes are very essential and crucial for normal and healthy outcome of pregnancy. One of the most important functions of fetal membrane is to remain intact and provide intra uterine environment to the fetus till true contractions of labor starts. In most pregnancies labor begins at term with intact fetal membranes. PROM is one of the common complications of pregnancy that has a major effect on the fetus and mother. Table. 1A & 1B showing the age distribution in PROM cases and without PROM cases with highest incidence being observed in the age group of 21-25 years with 49.3% and 59.2% respectively. The incidence is higher in this age group as this is the most common age of conception in the low socioeconomic group. This is similar to the study done previously where pre-labour rupture of membranes was found highest between the age group 20-25 years. The present finding is also similar to the study done by Garg A et al.⁷ Table 1C showing the relationship between culture results and age distribution in PROM cases shows that there is no significant association between them (p value=0.17) highest growth positivity is seen in >25 years of age distribution i.e. 9 samples were positive out of 15. This finding is consistent with the findings of Oboro et al where growth positivity is seen highest in 18-24 years.⁸ Table 2A showing the duration of leakage in cases of PROM with highest frequency 46.5% lies in the range of 13-18 hours of leaking per vagina. This is similar to study done by Silva et al and showed growth positivity between 8-24 hrs.⁹ But discordance to the findings by Freeman et al. where the growth positivity was higher in dribbling with >12 hours.¹⁰ Table 2C shows the relationship between culture results and duration of PROM. The frequency of culture positive result was same as 14 and 14 in 6-12 hours and 13-18 hours duration of PROM. And p value= 0.13 is insignificant between them. It is also clear from the above table that with increase in duration of PROM the chance of infection increases. Out of 16 samples in the duration of 19-24 hours 11 samples showed culture positive result. Out of 33 samples only 14 samples are culture positive in 16-18 hours of PROM and 14 out of 22 samples are positive in 6-12 hours of PROM.

CONCLUSIONS

Immediate labor induction seems to be the optimal management strategy to minimize neonatal and maternal morbidity in the setting of prelabor rupture of membranes at term gestations. In cases for which immediate induction is not feasible, labor induction remains the preferred option over expectant management if performed within the first 15 to 20 hours after prelabor rupture of membranes.

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Received on 24.10.24

Revised on 15.11.24

Accepted on 24.12.24

Published 15.1.25

Citation: Majumdar N, Pal K.

A study on bacteriological profile of genital tract in pregnant mother presenting with and without premature rupture of membrane in a teaching hospital of west bengal. J Indian Acad Obstet Gynecol. 2025;6(2): 14-20.

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