Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/18836
DOI URL: http://dx.doi.org/10.21474/IJAR01/18836

RESEARCH ARTICLE

STUDY OF VAGINAL FLORA AND ITS RELATIONSHIP WITH PRETERM LABOUR PAIN AND PPROM

Dr. Kratika Mangtani and Dr. Santosh Meena
Associate Professor.

Manuscript Info

Manuscript History
Received: 31 March 2024
Final Accepted: 30 April 2024
Published: May 2024

Abstract

Objective: The aim of this study is to describe the bacterial flora of women in preterm labor with or without premature rupture of membranes.
Methods: Prospective studies of 200 patients with preterm labor were performed.
Results: 32 of 200 patients with preterm labor (16%) had bacterial vaginosis. 76 of the 200 patients with preterm labor (38 %) developed premature rupture of the membranes (preterm PROM). Of the 76 patients with preterm PROM, 14 (18.4%) had bacterial vaginosis. Therefore, 14 of the 32 patients with bacterial vaginosis (43.75%) developed preterm PROM. An increased number of organisms detected from the vaginal discharge in patients with preterm labor was associated with preterm PROM. An increased number of organisms detected from the vaginal discharge in patients with preterm labor complicated with bacterial vaginosis was significantly associated with preterm PROM.
Conclusions: In preterm labor, the number of different species detected in the vagina provide sensitive and specific prediction of preterm PROM in patients with preterm labor.

Introduction:-

World Health Organization (WHO) and the International Federation of Gynaecology and Obstetrics (FIGO) defined that the preterm infants are those delivered before 37 weeks of completed gestation. Preterm birth is subdivided in to (1) early preterm - birth before 33 weeks 6 days, (2) late preterm – birth between 34 - 37 weeks. Late preterm births comprise 70% of all preterm births. Preterm premature rupture of membranes (PPROM) is defined as spontaneous rupture of the fetal membranes before 37 weeks of gestation and before the onset of labour. (1)

Preterm labour is one of the most challenging obstetric complications encountered by obstetricians. Preterm delivery affects one in ten births (11%) and the percentage is even greater in developing countries. Preterm premature rupture of membranes (PPROM) is a said concern when the rupture of fetal membranes occurs prior to 37 completed weeks of gestation and before the onset of labor and is responsible for 40% of all preterm births and is associated with a high perinatal mortality rate of 60-80% (2,3).

Corresponding Author:- Dr. Kratika Mangtani
Address:- Associate Professor.

The most serious outcome of preterm labour is often associated with adverse maternal and neonatal outcomes related to infection (4). Prostaglandins which are released because of infection stimulate uterine contractions leading to preterm labour.

Studies indicate that one of the most important aetiologies of preterm labour and PPROM is maternal lower genital tract infection and the risk of neonatal infection is increased among mothers whose genital tract is colonized with Group B- Streptococci and other virulent microbial organisms. Infection in early gestation may lead to congenital anomaly, abortions and altered foetal growth whereas preterm labour, PPROM and neonatal sepsis are more prevalent in late onset group (5).

The microorganisms that ascend via the lower genital tract to the foetal membranes result in the production and release of proinflammatory chemokines and cytokines, which may weaken the foetal membranes that lead to PPROM. In the process of inflammation, there may be prostaglandin release which prompts cervical changes consequently in preterm delivery. The structural and architectural integrity of the foetal membranes is disrupted by the actions of these bacterial enzymes, as a result, the membrane ruptures.

This study is about the relation of preterm labour and PPROM to maternal genital tract infections. Also, it aims to find out the common organisms in maternal lower genital tract infection in preterm labour and PPROM.

Objective:-

1. To find out the prevalence of vaginal infection in preterm labour and PPROM.
2. To identify common organisms in high vaginal swab culture.
3. To find out the incidence of neonatal sepsis and its relationship with vaginal swab culture in PPROM and preterm labour in present study.

Materials and Methods:-

• It is a prospective observational study conducted for four months from April 2023 to April 2024 at our tertiary care centre in the Department of Obstetrics and Gynaecology of JK LONE HOSPITAL, GOVERNMENT MEDICAL COLLEGE KOTA on attending outpatient (OPD) or labour room.
• Pregnant women between 28-37 weeks of gestation who set into spontaneous preterm labour only were included in the present study. Gestational age was assessed basing on the last menstrual period and dating scan.
• Women who had uterine contractions of 4 in 20min or 8 in 60 min associated with cervical dilatation of ≥1cm and effacement of >80% between 28-37 completed weeks of gestation were included in the study.

Inclusion criteria
• Pregnant women between 28-37 completed weeks of gestation who set into spontaneous preterm labour.

Exclusion criteria
• Pregnant women with >37weeks of gestation.
• Pregnant women with APH
• Pregnant women with Premature rupture of membranes
• Pregnant women with IUD
• Any pregnant woman whose pregnancy was terminated preterm for any maternal or foetal cause.

Written informed consent was obtained from enrolled women. Detailed history was taken with respect to age, parity, socioeconomic status, residence, previous pregnancy outcomes and for the presence of any risk factors in index pregnancy including genitourinary and respiratory infections, GDM, anaemia, hypertensive disorders, heart disease or any other medical disease, obstetric risks like hydramnios, multifetal gestation, malpresentation and uterine anomalies.

A thorough systemic and obstetric examination was done. Speculum examination was done to visualise cervix and vagina.

Per vaginal examination was done to note cervical length and dilatation, Obstetric Ultrasound for cervical length, AFI, EFW, placental localisation and separation were done.

Swab from the posterior fornix of vagina was taken and sent for gram staining and culture sensitivity. Midstream urine sample was sent for culture and sensitivity. Microbiological analysis and antimicrobial sensitivity testing of urine and high vaginal swab were done in the Department of Microbiology at our institute.

All patients were monitored for features of sepsis like fever, maternal tachycardia, uterine tenderness and foul smelling vaginal discharge.

Table 1:- Maternal Age.

MATERNAL AGE		
YEARS	NUMBER	PERCENTAGE
<22	26	13%
22-25	54	27%
25-30	86	43%
>30	34	17%
Total	200	100%

Table 2:- Gestational Age.

GESTATIONAL AGE		
GESTATIONAL AGE (in weeks)	NUMBER	PERCENTAGE
>28-33.6	78	39%
33.6-36.6	122	61%
TOTAL	200	100%

Table 3:- Obstetric Score.

OBSTETRIC SCORE		
GRAVIDA	NUMBER	PERCENTAGE
G1	48	24%
G2A1/G3A2/>G2P1	152	76%
TOTAL	200	100%

Table 4:- Vaginal Swab Reports In Preterm Labour/Pprom.

DIAGNOSIS		POSITIVE CULTURE	STERILE CULTURE	TOTAL
PRETERM LABOUR PAINS	NUMBER OF SWABS	32	168	200
	% OF SWABS	16%	84%	
PPROM in patients with preterm labour pains	Number of swabs	14	62	76
	% of swabs	18.4%	81.6%	

Table 5:- Vaginal Swab Cultures.

VAGINAL SWAB CULTURE		
Swab culture report	Number	Percentage
Sterile	168	84%
Klebsiella	16	8%
E.coli	8	4%
Pseudomonas	4	2%
Staphylococcus Aureus	4	2%
Total	200	100%

Table 6:- SEPSIS/ NICU ADMISSION/ NND.

		NUMBER OF BABIES	PERCENTAGE OF BABIES
SEPSIS	Present	46	23%
	Absent	154	77%
NICU Admissions	Yes	116	58%
	No	84	42%
Neonatal deaths	Present	30	15%
	Absent	170	85%

Table 7:- Neonatal Death and High Vaginal Swab (HVS) Culture Reports.

NEONATAL DEATHS	HIGH VAGINAL SWAB			
		STERILE	POSITIVE	TOTAL
PRESENT	No. of swabs	10	20	30
	%age of swabs	5%	10%	15%
ABSENT	No. of swabs	158	12	170
	%age of swabs	79%	6%	85%
TOTAL	No. of swabs	168	32	200
	%age of swabs	84%	16%	100%

Discussion:-

Total number of preterm deliveries at the institution during the period of study were 200, of which vaginal swab culture of 32 patients were positive for bacterial growth. Out of the 200 preterm vaginal deliveries 76 patients developed PPROM. Out of 76 patients with PPROM 14 had vaginal swab culture positive for bacterial growth. The most common organism isolated from the vaginal swab cultures was Klebsiella followed by E. coli. Group B Streptococcus was not isolated. Study by Goncalves LF et al (6) showed that positive vaginal swab cultures were obtained for 10-40% of preterm labour. An Indian study by Taralekar et al (7) states that infection is 2-3 times more common in patients with PPROM.

C. Karat et al (8) in a case control study found that E coli and Staph aureus were significantly associated with occurrence of PPROM. Group B Streptococcus and P Mirabilis were also isolated though not found in control group. Erich Hafner et al (9) found a significant association between Streptococci colonization and preterm birth. A study by Krychowska-Cwikla A et al (10) showed high virulence bacteria in vaginal swab culture and a statistical significance.

Some organisms like Gardnerella vaginalis, Fusobacterium, Mycoplasma hominis and Ureaplasma urealyticum are detected more frequently than others in amniotic fluid of women with preterm labour (11,12) But these organisms cannot be detected by conventional culture methods.

The incidence of neonatal sepsis is 23% and 58%babies needed NICU care. Stoll BJ et al(13) found a reduction in Group B Streptococcal sepsis and increase in E coli with no change in overall rate of early onset sepsis. Neonates with early onset sepsis were most likely to die, especially when infected with coliforms. (7,13). There were 30 (15%) neonatal deaths in his study and all had features of sepsis.

Maternal genital tract infection was associated with 66.66% NND (20/30 neonates). David P. Vander Ham et al (14) observed 3.4% neonatal sepsis with PPROM

Conclusion:-

Maternal genital tract infection is one of the causes of preterm labour and PPROM. Prevalence of lower genital tract infection in the present study is 16% and is associated preterm premature rupture of membranes. Most common organism isolated in High vaginal swab was Klebsiella followed by E. coli.

The incidence of neonatal deaths observed is 15% and 66.66% of this is found in neonates whose mother had lower genital tract infections.

References:-

(1) Cunningham FG, Leveno KJ, Bloom SL, et al. Williams obstetrics. 24th edn. McGraw-Hill Education 2014.
(2) Joyce EM, Moore JJ, Sacks MS: Biomechanics of the fetal membrane and prior to mechanical failure: review and implications. Eur J ObstetGynecolReprod Biol. 2009, 144:S121-7. 10.1016/j.ejogrb.2009.02.014
(3) Reynolds HD: Bacterial vaginosis and its implication in preterm labour and premature rupture of membranes. A review of the literature. J Nurse Midwifery. 1991, 36:289-96.
(4) Ziaei S, SadrkhanluM, Moeini A, Faghihzadeh S. Effect of bacterial vaginosis on premature rupture of membranes and related complications in pregnant women with a gestational age of 37-42 weeks. GynecolObstet Invest. 2006;61(3):135-8.
(5) Cohen-Wolkowiez M, Moran C, Benjamin DK, et al. Early and late onset sepsis in late preterm infants. PediatrInfect Dis J 2009;28(12):1052-1056.
(6) Gonçalves LF, Chaiworapongsa T, Romero R. Intrauterine infection and prematurity. Mental Retardation and Developmental Disabilities Research Reviews 2002;8(1):3-13.
(7) Vaishali T, Salil B, Girija W, et al. Vaginal infection as a cause for preterm labour, PPROM, PROM. Int J Adv Res 2014;2(7):1092-1096.
(8) Karat C, Madhivanan P, Krupp K, et al. The clinical and microbiological correlates of premature rupture of membranes. Indian J Med Microbiol 2006;24(4):283-285.
(9) Hafner E, Sterniste W, Rosen A, et al. Group B streptococci during pregnancy: a comparison of two screening and treatment protocols. Am J Obstet Gynecol. 1998;179(3 Pt 1):677-681.
(10) Krychowska-Ćwikła A, Dmoch-Gajzlerska E. Analysis of microorganisms isolated from cervical canal of pregnant women giving birth prematurely in Poland. Prog Health Sci 2011;1(1):63-72.
(11) [15] Hillier SL, Martius J, Krohn M, Kiviat N, et al. A casecontrolstudy of chorioamnionic infection and histologic chorioamnionitis in prematurity. N Engl J Med 1988;319(15):972-978.
(12) Yoon BH, Romero R, Park JS, et al. Microbial invasion of the amniotic cavity with Ureaplasma urealyticum is associated with a robust host response in fetal, amniotic, and maternal compartments. Am J ObstetGynecol 1998;179(5):1254-1260.
(13) Stoll BJ, Hansen N, Fanaroff AA, et al. Changes in pathogens causing early-onset sepsis in very-lowbirth-weight infants. N Engl J Med 2002;347(4):240- 247.
(14) van der Ham DP, van der Heyden JL, Opmeer BC, et al. Management of late-preterm premature rupture of membranes: the PPROMEXIL-2 trial. Am J ObstetGynecol 2012;207(4):276-e1-10.