



BACTERIOLOGICAL PROFILE OF UROGENITAL INFECTION AND IT'S ANTIBIOGRAM IN PRETERM LABOUR IN PMCH

Medical Microbiology

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ABSTRACT

Introduction: Preterm labour is define as the onset of labour before 37 completed weeks of pregnancy and is a leading cause of neonatal morbidity and motility worldwide . Urogenital infections (UGIs) are mostly Widespread when unhygienic condition present during pregnancy and consider as an important cause of premature labour. This study was done to see the association between preterm labour and urogenital infection & it's antibiogram. **Material and Methods:** A total hundred women were observe for uro-genital infections and their association with Pre term labour. Midstream urine was collected from IPD OBS & Gynae Department and cultured. Two high vaginal Swab was also taken. Naked eye examination was done. Smear was prepared for Gram staining of one Vaginal swab and from another culture was done. Microorganism isolated on culture plate where noted and antibiotic susceptibility was done by disk diffusion method in Microbiology Department. **Observation and Result:** Incidence of infection of Preterm labour was 41%. Maximum (62%) cases were between 18-25 years age. Sixty six percent of cases were primi gravida had preterm labour. Sixty five percent of the cases had no history of antenatal check up and 18% had history of abortions and 11% of cases had history of preterm delivery. Incidence of urinary tract infection in preterm labour was 14%, genital tract infection was 25% and 2% had both infection. **Conclusion:** Uro-genital infections during pregnancy are a major as well as important cause of maternal and perinatal morbidity. It's screening and treatment can limit morbidity .Detection of infectious which causes preterm birth, will provides another opportunities to reduce maternal and perinatal morbidity. Improving Intrapartum care and making availability of well-established neonatal unit will reduce maternal and perinatal morbidity and mortality in preterm labor.

KEYWORDS

Urogenital infection, Preterm labor, urinary tract infection, antibiotic susceptibility test

INTRODUCTION

Preterm labour is define as the onset of labour before 37 completed weeks of pregnancy and is a leading cause of neonatal morbidity and motility worldwide. WHO has estimated that 9.6% of all birth (about 13 million) in 2005 were Preterm. Africa and Asia accounted for almost 11 million¹. Many evidences suggest that infection place a major role in pathogenesis of preterm labour and delivery⁽²⁾ Though the incidence of Preterm labour is approx. 10% the Morbidity and motility is disproportionally high constituting 60- 80%, which is 2-7 times compared to term pregnancy. The rate of Preterm labour in India at present is around 21% India contribute 23.6% of Preterm birth of total Global incidence⁽³⁾. Lock Wood⁽⁴⁾, reported that an estimated 50% of spontaneous Preterm birth where associated with ascending genital tract infections. In 2001 Chhabra and Patil⁽⁵⁾ reported that 14 and 28% of patient in Preterm labour had positive urine and vaginal culture respectively. Most common Uro-pathogen in pregnant women is E. col, Klebsiella pneumoniae, Proteus mirabilis, enterobacter species, staphylococcus saprophyticus and group B streptococcus. Asymptomatic bacteriuria suggest significant bacteriuria without symptoms of infection. Significant Bacteria is define as $>10^5$ Colony forming unit (CFU) per ml of urine of a single Uro-pathogen culture from a clean catch midstream urine. In pregnancy asymptomatic urinary tract infection is very common and is linked with Preterm delivery. If bacteriuria without symptom is not treated in pregnant women, then it may lead to acute cystitis and pyelonephritis in 20 to 40% of cases. The presence of pathogenic bacteria in the bladder of pregnant women is associated with the mass colonisation of the inferior genital tract and the presence of chorio-amnionitis, even when the infection is sub clinical¹². Recognizing and treating the patient have a urogenital infection at a point when it has not become clinically noticeable will reduce the number of patient going into Preterm labour, resulting in decrease Morbidity and motility in the neonates born to such mothers.

Thus diagnosing and treating infection associated with Preterm labour represent a very attractive area for interventions to prevent serious and complicated neonatal outcome.

MATERIAL AND METHODS

In this study, total 100 subjects were selected randomly as per inclusion and exclusion criteria.

Inclusion Criteria

All Antenatal women in the age group of 21-35yrs. Gestational age

confirmed by LMP or USG. Preterm labour was documented according to ACOG criteria- Uterine contractions of 4 in 20 minutes or 8 in 60 minutes plus progressive cervical changes. Cervical dilatation of >1 cm. Cervical effacement of $>80\%$.

Exclusion Criteria

Multiple pregnancy, History of Ante partum Haemorrhage, Pregnant women with <28 weeks and >37 weeks of gestation, Pregnant women with APH, Pregnant women with IUD, Any pregnant woman whose pregnancy was terminated preterm for any maternal or fetal cause.

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, anemia, hypertensive disorders, heart disease or any other medical diseases, obstetric risks like hydramnios, multifetal gestation, malpresentation and uterine anomalies.

A thorough systemic and obstetric examination was done. Speculum examination was done to visualize cervix and vagina and to rule out cervical and vaginal infections.

Per vaginal examination was done to note cervical length and dilatation. Complete Blood count, Routine examination of urine, Obstetric Ultrasound for cervical length, Amniotic fluid index (AFI), Estimated Fetal weight (EFW), placental localization and separation were done.

Sample Collection

Urine: Mid stream clean catch urine is to be collected in wide mouthed container. History of the use of antibiotics is to be obtained.

Vaginal Swab: Two high vaginal swabs using vaginal speculum was collected from 100 females who were admitted in IPD of Obs & Gynae for Preterm labor.

Processing of Sample

Urine: Samples are processed within two hour of collection. Grams staining was done & pus cells and microorganisms were looked for. Culture was done of urine samples by using bacteriological loop of 4mm & diameter from the centrifuged sample & inoculated into Mac-conkey plate, Nutrient Agar plate, Blood Agar plate and also in CLED media. Plates were incubated at 37°C overnight. Colony count was

done & the isolates were identified further by biochemical reactions.

Vaginal Swab: Macroscopic examination: Naked eye examination was done to see whether the sample was purulent or blood stained. Microscopic examination: Smear was prepared from one vaginal swab, air dried and stained with Grams stain to look for pus cells, epithelial cells, clue cells and microorganisms. The other swab was streaked on Blood Agar (BA) plate Chocolate Agar (CA) plate MacConkey's Agar (MA) plate and incubated at 37°C for 18-24 hrs.

The antibiotic susceptibility- done on Mueller Hinton Agar (MHA) by Kirby-Bauer's disk diffusion method.

RESULT AND DISCUSSION

Our study showed 41% of Patients of PTL had urogenital infection. Of these 25% had genital infection, 14% had urinary tract infection and 2% had both infection.

Table-1: Incidence Of Infections

Type of Infection	No. of cases	Percentage
Urine tract infection	14	14%
Genital tract infection	25	25%
Both(Uro-genital infection)	2	2%

Table- 2: Maternal Age Wise Distribution Of Infection

Maternal Age	No. of Cases of infection	Percentage of infection
>18-25	19	46.3%
> 25-30	16	39.0%
> 30-35	6	14.6%

Chhabra and Patil et al reported that 14% and 28% of patient in Preterm labor had positive urine and cervical culture respectively. Indu verma, Kumkum Avashi and Vandana Berry et al, also reported UTI 13.46% and Genital tract infection 21.15%, while 2% have both.

18 to 25 years age group are most susceptible to acquire urogenital infection as seen in our study where 46% were in 18 to 25 years age group. Ajit Mehta et al⁶ and M.S Akhtar et al⁷ have also show high incidence of urogenital infection (40.3% and 30% to 50% respectively) in the age group of 20 to 25 years.

S.K. Agarwal et al⁸ have also shown a high incidence (87%) between 20 to 30 years.

Sixty six percent of the PTL was seen in primi gravida in our study. Ajit Mehta et al⁶ have analysed nine studies conducted between 1963 to 1969 in which 8 studies have shown high incidence of PTL in primi gravidas (29 to 38%). the majority (65%) were cases without ANC, compared to cases with ANC. In a study conducted by Trivedi et al⁹ in 1995 it was found that more of the unbooked cases compared to booked cases presented with preterm labor. The highest incidence of PTL occurred between 34 to 36 weeks of gestation (45%). Trivedi et al⁹ Muskar Rita et al¹⁰ have also shown an incidence 28%, 36% respectively in gestational age of 31 to 36 weeks. Raunt et al¹¹ and Mehta et al⁶ have also shown an incidence of 65% and 47% respectively between 35 and 36 weeks of gestation. There was a good correlation between Gram's stain and culture positivity. 34% showed pus cells and organisms in the direct smear of which 25% yielded growth.

Table-3: Pathogens Isolated From Urine

Organisms	Single infection	Mixed infection
E.coli	9	1
Staphylococcus aureus	1	-
Klebsiella Species	2	1
Enterococcus Species	1	
Pseudomonas Species	1	
Proteus Species	1	

Table-4: Pathogens Isolated From Vagina

Organisms	Single infection	Mixed infection
E.coli	8	2
Enterococcus species	7	2
Staphylococcus aureus	2	1
Klebsiella Species	4	1
Cogulase -ve staph aureus	2	-
Pseudomonas Species	1	-

27% of cases which have growth on vaginal swab cultures, the majority organism isolated was Enterococcus species and E. coli followed by Klebsiella species, Coagulase positive Staphylococci, Coagulase negative Staphylococcus, Pseudomonas species and other organisms isolated. Raunt et al¹¹ and Agarwal et al⁸ have also shown the predominating pathogen in the cervical swab culture were those belonging to the members of Enterobacteriaceae. Of the 16% showing growth in urine, the predominating organism was E. coli followed by Klebsiella species, coagulase positive Staphylococcus, Pseudomonas species and Enterococcus species.

Linda Hillebrand et al¹³ Jai Bhagawan Sharma et al¹², Sutapa Bandyopadhyay et al¹⁴ have also shown E. coli as the predominating pathogen in urinary tract infection resulting in PTL.

Table-5: Antibiotic Susceptibility Of Gram Negative Organism

	E. Coli (20)	K. pneumo (8)	Pseudo sp (2)	Proteus mirabilis (1)
Amoxycylav	12	2	0	0
Amikacin	15	5	1	1
Levofloxacin	9	4	2	1
Cotrimoxazole	5	1	0	0
Piperacillin+Tazobactam	18	7	2	1
Ceftriaxone	7	3	0	0
Cefoperazone	4	2	1	0
Meropenam	20	7	2	1
Gentamycin	14	6	1	1
Nitrofurantoin	9	2	0	0

Table-6: Antibiotic Susceptibility Of Gram Positive Organism

	Ent. Fecalis (10)	Staph. Aureus (4)	Coag-ve staph (2)
Ampicillin	7	1	0
Amoxycylav	8	3	2
Amikacin	0	2	1
Levofloxacin	6	1	1
Cotrimoxazole	0	1	2
Gentamycin	0	1	1
Erythromycin	3	2	1
Ceftriaxone	0	2	1
Linezolid	9	3	2
Nitrofurantoin	1	1	0

Nitrofurantoin is the drug of choice in all types of UTI infection. Proteus and Pseudomonas are resistance with nitrofurantoin. Other organism are Enterococcus 100%, E. coli 90%, Klebsiella 33 percent are sensitive in our study. In our study, E. coli, Enterococcus species, Klebsiella species are main infective organism. In which E. coli is mostly sensitive to Meropenem, amikacin, amoxycylav. Enterococcus are mostly sensitive to Linezolid, Amoxycylav, Ampicillin. Klebsiella are mostly sensitive to Meropenem, Pipra+Tz, and Amikacin.

CONCLUSION

We conclude that in our study 41% of the cases of Pre term labor had Uro-genital infection which indicate a significant association of urogenital infection in preterm labour. Infection is one of the important and preventable cause of Preterm labor. So, early diagnosis of infection and treating them properly with susceptible antibiotic reduces Preterm labor, Preterm birth and also perinatal morbidity and motility.

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