INCIDENCE OF UROGENITAL INFECTIONS IN PRETERM LABOUR AND
PREMATUR Em RUPTURE OF MEMBRANES

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HOW TO CITE THIS ARTICLE:

ABSTRACT: INTRODUCTION: Urogenital infections are common causes of preterm labor (PTL) and premature rupture of membranes (PROM). The present study was aimed at correlating the colonization of the organisms and possible infections in the vagina and urinary tract of mothers presenting with preterm labor and premature rupture of membranes with colonization of the same organisms in the newborn. MATERIALS AND METHODS: One hundred high vaginal swabs and urine of patients with preterm labor and premature rupture of membranes were subjected to bacteriological studies according to the recommended procedures. Ten nasopharyngeal swabs from the newborn were collected from the neonates and looked for colonization of the organisms. RESULTS: Out of 55 and 36 cases of PROM and PTL, 69% and 72% showed infection respectively (Table 1). Out of 9 patients with both PROM and PTL, 44% had infection. The commonest organisms isolated were Enterococcus species (27%) and Klebsiella species (24%) from vaginal infection and Escherichia coli (3%) and S. aureus (2%) from Urinary tract infection. The organisms isolated from cases of PROM and PTL are also demonstrated in the nasopharynx of the newborn. CONCLUSION: Urogenital infections constitute major risk factors for premature of membrane and preterm labour, which is entirely preventable. KEY WORDS: PROM, PTL, BA, MA.

INTRODUCTION: Preterm birth is a leading cause of neonatal morbidity and mortality. The cause of most preterm births is not known, but a variety of conditions have been shown to be associated, with an increased risk of preterm delivery. A substantial body of knowledge indicates that one of the causes is infections of the urogenital tract resulting in preterm labor (PTL) and premature rupture of the membranes (PROM). Though the incidence of PTL is 10%, the morbidity & mortality is disproportionately high constituting 60 to 80%, which is 2 to 7 times compared to term pregnancies. Preterm birth is the leading cause of neonatal morbidity and mortality. Prematurity is associated with nearly 70% of the perinatal mortality in India. It is also responsible for many of the physical & mental deficiencies detected later in children. The neonatal intensive care unit equipments together with neuro developmental handicaps associated with the infants who have survived account for the expenses. It is necessary to prevent preterm labor not only in view of cost but also to provide a healthy study.

MATERIALS & METHODS: Two high vaginal swabs (HVS) using vaginal speculum & midstream clean catch samples were collected from 100 females who were admitted to labour ward either with PTL or PROM (Cases). And 50 females who presented at term (Controls) during the period from
2003 March to 2006 March. History of the use of antibiotics was obtained. Of these 100 cases 30 were booked & 70 were unbooked.

**Vaginal Swabs:** Naked eye examination was done to see whether the sample was purulent or blood stained. Smear was prepared from one vaginal swab, air dried and stained with Grams stain & look for pus cells, epithelial cells, clue cells & micro organisms. The other swabs was streaked on Blood Agar (BA) plate, Chocolate Agar (CA), plate & MacConkey’s Agar (MA) plate & incubated at 37°C for 18 to 24 hours. BA & CA plates were provided with 5%CO₂ through candle jar & the swab was twirled in Todd-Hewitt broth (THB). To detect genital carriage of S. agalactiae during pregnancy. Organism grown on BA, CA & MA were identified using recommended procedure4.

**Urine:** Samples are processed within half an hour of collection. The sample was grams stained & looked for pus cells and micro organisms. Semi quantitative was culture was done by using bacteriological loop of 4mm & diameter from the uncentrifuged sample & inoculated into MA Plate as lawn culture & if Gram positive cocci was seen in the direct smear. BA Plate was also used & Streaked for isolation. Both the plates were incubated at 37°C overnight. Colony count was done & the isolate was identified by recommended procedures 4.

**RESULTS:**

<table>
<thead>
<tr>
<th>Cases</th>
<th>Number (100)</th>
<th>General Infection</th>
<th>Urinary Tract Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive No. (%)</td>
<td>Negative No. (%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Positive No. (%)</td>
</tr>
<tr>
<td>PROM</td>
<td>55</td>
<td>38(69%)</td>
<td>17(31%)</td>
</tr>
<tr>
<td>PTL</td>
<td>36</td>
<td>26(72%)</td>
<td>10(28%)</td>
</tr>
<tr>
<td>PROM &amp; PTL</td>
<td>9</td>
<td>4(44%)</td>
<td>5(56%)</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>68(68%)</td>
<td>32(32%)</td>
</tr>
</tbody>
</table>

Table 1: Incidents of Urogenital infections in preterm labour & premature rupture of membranes of mothers

Table 2: Correlation of Gram’s stain with culture
Figure 1: Maternal Age wise distribution of Possible Urogenital infections:

Figure 2: Pathogens Isolated from HVS b& Urine of PROM & PTL Cases
Out of 100 cases 55 had PROM, 36 had PTL & 9 had PROM & PTL (Table 1). 70 were unbooked cases & 30 booked cases. Maximum (70) numbers of cases of PROM & PTL were seen in the primigravida of the age group of 18 – 24 years (Fig 1). There was a high co relation between direct Gram’s smear examination of urine and high vaginal swab & culture positivity 69% & 72% of patients with PROM & PTL respectively had possible had genital infection & 8% had possible urinary tract infection at the time of their presentation. Various organisms isolated in PROM, PTL & PROM & PTL respectively either as a single infection or as a mixed infection is shown in figure 2. Approximately 1% PROM & 0.5% PTL Cases had an associated urinary tract infection as also observed by others. 5 out of the 80 live births in cases with PROM & PTL, 37 had perinatal mortality either in the form of still birth or early neonatal deaths (Figure 3). Similar organisms were also demonstrated in the nasopharyngeal swabs of 10 children born to mothers of PROM & PTL who had possible urogenital infection.

**DISCUSSION:** Infections in the female reproductive tract especially the cervix cause PROM & initiate PTL, this process is in turn responsible for many preventable infant deaths. PROM is consistently associated with increased perinatal & maternal morbidity. The cost of preterm neonatal care is high to all classes of society & especially for developing & under developed countries. It is hence necessary to prevent preterm labour not only in view of cost but also to provide a healthy baby. Current finding suggests that the causes in majority of PROM cases are maternal infection especially latent urogenital infection. PROM cases presented with history of leaking of liquor per vagina, while most of the PTL Cases presented with history of labour pains, few of them complaint of bleeding for vagina. The present study showed 76% f patients (PROM, PTL & PROM & PTL) had possible urogenital infection. Of these 68% had genital tract infection & 8% had urinary tract infection (Table 1). (18 – 24) Years age group appears to be the most vulnerable age to acquire urogenital infection as seen in present study. The high incidence of PROM & PTL between the 2nd & 3rd decade of life could be attributed to genital tract infection & sexual activity (6). The higher incidence encountered in this study could be attributed to the fact that the majority (70%) were unbooked cases compared to booked cases. The lack of antenatal care among unbooked cases will result in the absence of
recognition of risk factors & subsequent rectification resulting in high incidence of PROM & PTL. The more number of unbooked cases in our study could have resulted in a high incidence of PROM & PTL. Of the 68% of cases showing growth from cervical swab cultures, the predominant organisms isolated were Enterococcus species(27) and Klebsiella species (24) other organisms isolated were Escherichia coli(11) Citrobacter species, Coagulase positive staphylococcus, Coagulase negative staphylococcus, group 'A' Beta hemolytic Streptococcus, Candida albicans, other Candida species, Pseudomonas species, Proteus species, Non fermentative Gram negative Bacilli other than Pseudomonas species (Figure 2). Due to the proximity of genital tract to the rectum where many member of Enterobacteriaceae and Enterococcus are present; it is not surprising to anticipate colonization of the genital tract by these organisms; whenever there is a poor hygienic. Of the 8% showing growth in urine, the predominating organism was Escherichia coli followed by coagulase positive staphylococcus the present study has also showed a very high mortality rate of 37% of which still birth was seen in 20% & early neonatal death in 17%. A correlation was made in 10 mothers between the organisms isolated from cervical swab of mothers developing PROM & PTM with the nasopharyngeal swabs of the newborns. The same organisms isolated from the cervical swab from mothers developing PROM & PTL were isolated from the newborns nasopharyngeal swab. This shows that the colonization of the organisms in the cervix of the mothers developing PROM & PTL subsequently colonized in the nasopharynx of the newborns. A genitourinary tract infection is one of the causes of the preterm delivery & prematurity is one of the leading causes of perinatal mortality. Uterine contractions may be induced by cytokines & prostaglandins, which are released by microorganisms. So one can help the pregnant women to prevent preterm birth by becoming aware of the symptoms of preterm labour & initiating steps in the form of using appropriate antibiotics based on grams smear so as to bring down the perinatal mortality & maternal morbidity.

REFERENCES:

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Date of Submission: 05/09/2013.
Date of Peer Review: 12/09/2013.
Date of Acceptance: 26/09/2013.
Date of Publishing: 01/10/2013.