Section: Obstetrics and Gynaecology

Original Research Article

A STUDY ON EVALUATION OF RELATIONSHIP BETWEEN HIGH VAGINAL SWAB CULTURE AND FETO-MATERNAL OUTCOME IN PRETERM RUPTURE OF MEMBRANES

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ABSTRACT

Background: Preterm rupture of membranes (PROM) refers to the breaking of the amniotic sac and leaking of amniotic fluid before labor begins, specifically before 37 weeks of gestation in the case of preterm PROM (PPROM). This condition is associated with several adverse maternal and neonatal outcomes, including infection, preterm birth, and complications related to prematurity. High vaginal swab culture (HVSC) is a diagnostic procedure used to detect and identify microorganisms in the vaginal flora. Owing to the scarce literature on the relationship between HVSC results and feto-maternal outcomes following PROM, this study was conducted to evaluate the same.

Materials and Methods: 100 antenatal women who presented to the Labour room in the Department of Obstetrics and Gynaecology, Shadan Institute of Medical Sciences with PPROM and PROM, over 18 months, i.e. from 1st July 2022 to 30th November 2023, were studied.

Results: most of the women belonged to 20-30 years of age group. 30% of women had a positive result for high vaginal swab (HVS) culture and sensitivity. The most common organism isolated in present study was E.coli, followed by Klebsiella. Most of the neonates had normal birth weight. 30% of the neonates required NICU admission.

Conclusion: Premature rupture of fetal membranes is associated with increased risk of intrauterine infection, and it has been one of the most common causes of perinatal deaths and NICU admissions.

Keywords: Preterm rupture of membranes, high vaginal swab, vaginal flora, neonatal sepsis, neonatal NICU.

INTRODUCTION

Premature Rupture of Membranes (PROM) refers to the rupture of fetal membranes before labor onset, and preterm PROM (PPROM) refers to rupture of membranes if it occurs before 37 weeks of gestation (term period). It affects about 8% of term pregnancies and 1% of all preterm pregnancies, with higher rates in African American women. Infections, previous PROM, polyhydramnios and short cervical length are some of the most common causes of PROM.[1]

PROM is associated with adverse feto-maternal outcomes such as fetal infection, umbilical cord compression and prolapse, intra-uterine death, preterm delivery, low birth weight, low APGAR score and fetal perinatal injuries.[2]

Genital infections such as Chlamydia trachomatis, Trichomonas vaginalis, bacterial vaginosis, and Neisseria gonorrhea, especially during pregnancy, can lead to premature rupture of membranes (PROM), which poses significant risks to the mother and child.[3,4]

PROM exposes to fetus to the maternal genital flora inhabiting pathogenic organisms which invade the amniotic cavity. This could be the primary source of neonatal sepsis.[5,6]

Diagnostic methods include high vaginal swab, microscopy, pH testing and ultrasonography. Although there is evidence linking genital infections to PROM, the findings from many studies are inconsistent, and it remains unclear whether the proportion of confirmed genital infections differs between women with and without PROM. Despite the plausible association, this study was undertaken to evaluate the relationship between positive high vaginal swab cultures and feto-maternal outcomes in PROM.

MATERIAL AND METHODS

This prospective study was conducted in the Department of Obstetrics, Shadan Institute of Medical Sciences over 18 months, i.e. from 1st July 2022 to 30th November 2023. All antenatal mothers with term gestation presenting to the institution with PPROM and PROM were included in the study.

Patients presenting to the institution greater than 6 hours after PPROM /PROM, patients with features of chorioamnionitis (fever, foul smelling liquor, fetal distress, meconium stained liquor), women presenting in active labour, high risk pregnancies such as multiple pregnancies, gestational hypertension, gestational diabetes mellitus, polyhydramnios and intrauterine death were excluded from the study

A detailed history was taken with special emphasis on history of time of leakage from vagina, duration of leakage, color of liquor at the time of presentation, history of any genital infections during pregnancy, number of antenatal visits, any recent history of fever, etc. A complete general and obstetric examination was done.

Before per-vaginal examination, two high vaginal swabs were taken and sent for culture and sensitivity. All patients were started on intravenous antibiotics empirically.

Ethical committee approval was taken from the ethics committee before beginning the study. A written informed consent was taken from all the patients prior to their inclusion into the study.

All data was entered into Microsoft excel sheets and analysed.

RESULTS

100 antenatal mothers presenting to the casualty with PROM were included in this study. Out of 100 mothers, positive vaginal swab was seen in 30% of the patients. The mean age of study group is 24.5 years with most of them belonging to 21-30 years of age. Most of the mothers were primigravida (65%). 40% of the mothers presented in gestational age of 34 - <37 weeks.

The most common mode of delivery was by normal vaginal delivery (65%). 25% of the patients underwent LSCS, with fetal distress being the most common indication. [Table 2]

Most common organism isolated in present study was E. coli (16%), followed by Klebsiella (12%). [Table 3]

Most of the neonates had normal birth weight (>2.5kg). Out of the 100 patients, 30% required NICU admission. 12 had neonatal sepsis. 37% had maternal complications. [Table 4]

Table 1: A Patient characteristics

Patient characteristics		Positive high vaginal culture	Negative high vaginal culture
Age	≤20 years (n = 29)	9%	20%
	21– 30 years (n = 50)	15%	35%
	>30 years (n = 21)	6%	15%
Parity	Multigravida (n = 35)	10%	25%
	Primigravida (n = 65)	20%	45%
Gestational age	28- <34 weeks (n = 35)	10%	25%
	34 - <37 weeks (n = 40)	15%	25%
	>37 weeks (n = 25)	5%	25%
History of genital infections	Present (n = 30)	20%	10%
	Absent (n = 70%)	10%	60%

Table 2: Mode of delivery

Mode of delivery	Positive high vaginal culture	Negative high vaginal culture
Normal vaginal delivery (n = 65)	18%	47%
LSCS (n = 25)	9%	16%
Assisted vaginal delivery (n = 10)	3%	7%

Table 3: vaginal swab culture report

Organism isolated	No. of patients
Normal vaginal flora	47%
E. coli	16%
Klebsiella	12%
staphylococcus	3%
Acinetobacter	5%
Candida albicans	10%
Non- albicans candida	4%
Streptococcus	2%
Pseudomonas	1%

Table 3: Post-delivery characteristics

Post-delivery characteristics		Positive high vaginal culture	Negative high vaginal culture
Birth weight	>2.5 kg (n = 59)	10%	49%
	1.5-2.5 kg (n = 26)	13%	13%
	1-1.5 kg (n = 10)	4%	6%
	<1000g (n = 5)	3%	2%
NICU admission	Yes (n = 30)	14%	16%
	No (n = 70)	16%	54%
Presence of neonatal sepsis	Yes (n = 12)	11%	1%
	No (n = 88)	19%	69%
Maternal complications	Postpartum hemorrhage (n = 12)	5%	7%
	Pyrexia (n = 25)	13%	12%
	No complications (n = 63)	12%	51%

DISCUSSION

This prospective observational study was conducted in the Department of obstetrics over a period of 1 year. The study included 100 antenatal women who had presented to the casualty of the institution with PROM of <6 hours duration.

In present study, majority of the women belong to 21-30 years of age group. This is in accordance with studies done by Amina et al,[7] (51.4%). Dudhrajia et al8 reported a higher prevalence of women aged below 25 years. This difference could be owing to the culture of early age marriages in India.

Most of the women are primigravida, which is in accordance with the study done by Anita et al.[10] However, Telayneh et al,[11] reported most of their study population being multigravida.

Most of the women in present study belonged to 34-37 weeks of gestation. This is in accordance with study by Amina et al.[7]

67% of the patients had a normal vaginal delivery despite of presenting with PROM. Studies by Preetha et al,[12] Amina et al,[7] and Anita et al,[10] also report majority of women undergoing normal vaginal delivery.

The prevalence of positive culture report in present study was 30%. E.coli was the most commonly isolated organism in present study. Amina et al,[7] and Preetha et al,[12] also report similar observation. However, Shivaraju et al,[12] observed Staphylococcus aureus as the most common organism isolated in their study.

In present study, 30% of the neonates were admitted into NICU and 12% of them had neonatal sepsis. In study by Amina et al,[7] 51.4% of the neonates had got admitted into NICU and out of them 34.3% had been diagnosed with neonatal sepsis.

In present study, 5% of the mothers had PPH and 13% had pyrexia. This is in accordance with study done by Shivaraju et al,[12] (PPH – 3%, pyrexia – 10%).

CONCLUSION

Premature rupture of membranes (PROM) is a significant complication that can affect 5-10% of all pregnancies. The risk of complications increases with a decrease in gestational age. Diagnosing PROM can be challenging, as the symptoms may not always be clear-cut. However, it is crucial to recognize the underlying etiological factors and implement appropriate management strategies.

To address this issue, it is essential to educate women on the importance of regular antenatal care, where they can receive guidance on diet, nutrition, and personal hygiene. Early detection and treatment of genital tract infections are also crucial in preventing PROM. Pregnancies complicated by PROM should be closely monitored, and labor should be supervised, preferably in a healthcare institution. The management of each case must be tailored to the individual's needs, as a one-size-fits-all approach may not be effective.

By adopting a team-based approach, healthcare providers can work together to identify PROM early on and implement appropriate interventions. This comprehensive approach, which includes recognizing the associated complications and managing the situation effectively, can significantly reduce the problems caused by PROM.

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