

## To evaluate the reliability of Urea and Creatinine values in vaginal wash fluid for the diagnosis of PROM

Dr. Shalini Gupta<sup>1</sup>, Dr. Gaurav Chittora<sup>2</sup>

<sup>1</sup>Department of Obstetrics & Gynecology, Dr. Laxminaryan Pandey Medical College, Ratlam, M.P

<sup>2</sup>Department of Psychiatry, Dr. Laxminaryan Pandey Medical College, Ratlam, M.P

Corresponding Author: Dr. Shalini Gupta

### KEYWORDS

reliability, urea, creatinine, vaginal & PROM.

### ABSTRACT

**Background & Methods:** The aim of the study is to evaluate the reliability of urea and creatinine values in vaginal wash fluid for the diagnosis of PROM. Study performed on pregnant women in the third trimester between 28 and 37 weeks of gestation with history of possible leakage of amniotic fluid at tending in the department of Obstetrics and Gynaecology. **Results:** Total 50 subjects were recruited. Group 1 is PROM confirmed 25 subjects. Group 2 were controls and in each group 25 subjects were allotted. The comparison of co-morbidity between study groups in vaginal wash fluid to diagnosis the high rupture of membrane. Around 24% of subjects had co-morbidity in PROM confirmed category. **Conclusion:** In PROM confirmed subject urea level was  $9.99 \pm 4.16$  and in controls it was around  $4.12 \pm 2.65$ . This shows that both PROM confirmed and suspected subjects had increased urea level than the control group. Thus urea and creatinine levels in vaginal wash fluid serves as an excellent diagnostic marker in diagnosing premature rupture of membrane. In conclusion, our study demonstrated that the measurement of vaginal fluid urea and creatinine is a simple and reliable test for diagnosis of PROM.

## 1. Introduction

Pre labor rupture of membranes (PROM) also known as premature rupture of membranes, is breakage of the amniotic sac before the onset of labor. When the membrane rupture occurs before 37 weeks of pregnancy, it is referred to as preterm PROM (PPROM). PPRM contributes about one fourth of all cases of ruptured membranes[1]. It is a known important contributor to maternal and perinatal morbidity and mortality. The foetus loses the relative isolation and protection afforded within the amniotic cavity in premature rupture of membranes. It is often associated with significant maternal and neonatal complications and management approaches are often varied and debated[2].

It occurs in 10% of all term pregnancies and about 2 - 4% of preterm pregnancies, with complications such as infection and preterm birth[3]. The incidence of PROM has remained stable through the years and has been reported to be between 3 - 18.5%.

PROM complicates about 2% to 4% of all singleton pregnancies and 7% to 20% of twin pregnancies. It is the leading cause of preterm labor and accounts for 18% to 20% of perinatal deaths and 21.4% of morbidity. When PROM occurs at term, approximately 75% of women will deliver within 24 hours of rupture of membrane[4]. The latency period tends to be longer with decreasing gestational age i.e., at 26 weeks, only half of women are in labour within 1 week and at 32 weeks, half will labour within 24-48 hours.

Preterm premature rupture of membranes (PPROM) refers to the occurrence of this event prior to 37 weeks gestation and accounts for about one fourth of all cases of ruptured membranes[5]. Urea plays a critical role in the metabolism of nitrogen - containing compounds in the urine. Creatinine is a breakdown product of creatinine phosphate in muscles and is usually produced at a fairly constant rate and is mainly filtered out of the blood by kidneys. Urea and creatinine of fetal urine are the most important sources of amniotic fluid in second half of pregnancy[6].

## 2. Material and Methods

Present study was conducted at Dr. Laxminaryan Pandey Medical College, Ratlam for 01 Year. This study is a prospective case-control study performed on pregnant women in the third trimester between 28 and 37 weeks of gestation with history of possible leakage of amniotic fluid at tending in the department of Obstetrics and Gynaecology.

#### Inclusion criteria:

1. Women who gave consent for the study
2. Women with singleton pregnancy and gestational age between 28 to 37 weeks will be included.

#### Exclusion criteria:

1. Women who are not willing to participate in the study
2. Meconium stained amniotic fluid
3. Visible blood in vaginal secretion
4. Intercourse in the prior night
5. Use of vaginal drugs
6. Presence of fetal anomalies

Consent was taken from patients with or without history of leaking per vaginum.

1. Demographic details will be noted and General, Systemic and obstetrical examination will be done and followed by the speculum examination.
2. 5 ml of sterile normal saline is instilled posterior fornix

### 3. Result

**Table 1: Statistics of the study group**

Groups	No.	Percentage
PROM Confirmed	25	50
Control	25	50

Total 50 subjects were recruited. Group 1 is PROM confirmed 25 subjects. Group 2 were controls and in each group 25 subjects were allotted.

**Table 2: Comparison of Urea level between study groups in the vaginal wash fluid to diagnosis the high rupture of membrane**

Parameter	PROM Confirmed (Mean $\pm$ SD)	Control Mean $\pm$ SD)	P Value
Urea level in mg/dl	9.99 $\pm$ 4.16	4.12 $\pm$ 2.65	0.0026

The comparison of urea level between study groups in the vaginal wash fluid to diagnosis the high rupture of membrane. The urea level in PROM confirmed subjects was 9.99  $\pm$  4.16, and in controls it was around 4.12  $\pm$  2.65. It was found to be statistically significant (p=0.0026).

**Table 3: Comparison of Creatinine level between study groups in vaginal wash fluid to diagnosis the high rupture of membrane**

Parameter	PROM Confirmed (Mean $\pm$ SD)	Control Mean $\pm$ SD)	P Value
Creatinine in mg/dl	0.556 $\pm$ 0.412	0.079 $\pm$ 0.132	0.039

The comparison of Creatinine level between study groups in vaginal wash fluid to diagnosis the high rupture of membrane. The value of creatinine in PROM confirmed cases were higher, followed by group 2 of PROM suspected cases and then lower values are noted in control. Creatinine level in PROM confirmed cases were 0.556  $\pm$  0.412, and in control it was 0.079  $\pm$  0.132. It was found to be statistically significant (p=0.039).

**Table 4: Comparison of Co-morbidity between study groups in vaginal wash fluid to diagnosis the high**

#### rupture of membrane

Comorbidity	PROM Confirmed (Mean $\pm$ SD)	Control (Mean $\pm$ SD)	P Value
Present	06	00	0.048
Absent	19	25	

The comparison of co-morbidity between study groups in vaginal wash fluid to diagnosis the high rupture of membrane. Around 24% of subjects had co-morbidity in PROM confirmed category.

#### 4. Discussion

Around 3-18% of pregnant women undergo premature rupture of membranes. It results in the loss of the natural protection causing bacterial invasion. Consequently, both mother and fetus are at a greater risk of infection. PROM has an evident role in prenatal mortality and morbidity. It causes 18-20% of prenatal mortalities and 21.4% of prenatal morbidity. So early diagnosis and treatment of PROM is utmost important to prevent complications[7].

Kariman et al., have observed that the mean vaginal fluid urea levels in confirmed PROM, suspected and control groups were  $13.77 \pm 5.41$  mg/dl,  $4.71 \pm 3.64$  mg/dl and  $5.13 \pm 5.97$  mg/dl, respectively ( $P < 0.001$ ). The cut-off value of washing vaginal fluid urea was 6 mg/dl with sensitivity, specificity, positive and negative predictive values of 90%, 79%, 83% and 87.5% [8].

Tigli A et al., used a cut-off value of urea in vaginal fluid as 10 mg/dl and found that the sensitivity, specificity, positive and negative predictive values of urea in diagnosis of PROM were 26.7%, 100%, 57.7% and 100%, respectively [9].

In our study, the value of creatinine in PROM confirmed cases were higher, followed by group 2 of PROM suspected cases and then lower values are noted in control. Creatinine level in PROM confirmed cases were  $0.556 \pm 0.412$ , in suspected PROM cases it was  $0.079 \pm 0.132$  and in control it was  $0.085 \pm 0.132$ . It was found to be statistically significant ( $p=0.000$ ) [10].

Elgohary A et al., have reported that the mean vaginal fluid creatinine in PROM group was significantly higher than in the control group,  $0.35 \pm 0.12$  mg/dl vs  $0.16 \pm 0.08$  mg/dl, respectively ( $P < 0.001$ ). ROC analysis showed that the best cut-off value was 0.2 mg/dl. The sensitivity, specificity, PPV and NPV of washing vaginal fluid creatinine were 100%, 84%, 86.2% and 100% respectively [11].

#### 5. Conclusion

In PROM confirmed subject urea level was  $9.99 \pm 4.16$  and in controls it was around  $4.12 \pm 2.65$ . This shows that both PROM confirmed and suspected subjects had increased urea level than the control group. Thus urea and creatinine levels in vaginal wash fluid serves as an excellent diagnostic marker in diagnosing premature rupture of membrane. In conclusion, our study demonstrated that the measurement of vaginal fluid urea and creatinine is a simple and reliable test for diagnosis of PROM.

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