UREA AND CREATININE IN VAGINAL WASHING FLUID IN DIAGNOSIS OF PRELABOUR PREMATURE RUPTURE OF MEMBRANES

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بسم الله الرحمن الرحيم

وَأَنْزَلَ اللهُ عَلَيْكَ الْكِتَابَ
وَالْحِكْمَةَ وَعَلَّمَكَ مَا لَمْ تَكُنْ
تَعْلَمُ
وَكَانَ فَضْلُ اللهِ عَلَيْكَ عَظِيمًا

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ABCTRACT

is therefore important to achieve accurate diagnosis by identifying the presence of specific amniotic fluid markers in vaginal environment. These tests include measurement of vaginal pH, prolactin, α fetoprotein, di-amine oxidase, insulin-like growth factor binding protein-1(IGFBP-1), human chorionic gonadotropin and fetal fibronectin. All these tests have advantages and drawbacks. Up till now there is no gold standard test for PROM.

KEY WORDS

Urea_creatinine _diagnosls

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LIST OF ABBREVIATIONS

AF	Amniotic Fluid
AFI	Amniotic Fluid Index
AFP	Alfa-Feto Protien
BPP	Biophysical Profile
BV	Bacterial Vaginosis
CAM	Chorioamnionitis
CAPs	Contraction Associated Proteins
CNS	Central Nervous System
CRP	C- Reactive Protien
CS	Cesarean Section
CT	Chlamydia Trachomatis
DAO	Diamine - Oxidase
DNA	Deoxi Neouclic Acid
ELISA	Enzyme- Linked Immuno Sorbant Assay
ESR	Erythrocyte Sedimentation Rate
fFN	Fetal Fibronectin
GA	Gestational Age
GBS	Group B Streptococcus
G-CSF	Granulocyte Colony Stimulating Factor
HCG	Human Chorionic Gonadotropin
HFUPR	Hourly Fetal Urine Production Rate
IGFBP-1	Isulin- link Growth Factor Binding Protien-1
IL-1B	Interleukin-1B
IUGR	Intrauterine Growth Restriction
LDH	Lactate Dehydrogenase
LPS	LipoPoly Saccharied
MMP	Matrix MetalloProteinases

NP IGFBP-1	Non Phosphorylated IGFBP-1
NPV	Negative Predictive Value
NS	Non Significant
PGE2	Prostaglandin E2
PGF2α	Prostaglandin F2 alpha
PPROM	Preterm Premature Rupture Of Membrane
PPV	Positive Predictive Value
PTL	Preterm Labour
RDS	Respiratory Distress Syndrome
ROC	Receiver Operating Characteristic Curve
ROS	Reactive Oxygen Species
SD	Standard Deviation
S/D	Systolic Diastolic Ratio
STD(S)	Sexually Transmitted Diseases
TIMPs	Tissue Inhibitors of MetalloProteinases
TNF	Tumor Necrosis Factor
vAF	Vaginal Amniotic Fluid
VS	Versus
+VE	Positive
-VE	Negative

INTRODUCTION

Premature Rupture of the Membranes (PROM) constitutes one of the most important dilemmas in current obstetric practice, it could be defined as rupture of the fetal membranes before the onset of labour irrespective of gestational age *(Ngwenya and Lindow, 2007).*

Premature rupture of membranes occurs in 10% of all gestations and about 2-4% of preterm pregnancies. At term approximately 95% of women with PROM deliver within 28 hours after rupture. However, at earlier gestational ages, continuation of pregnancy is much more likely **(Modena et al., 2004).**

The risk of maternal and fetal infection increases as the time between the rupture of membrane and the onset of labour increase. Maternal infection is termed chorioamnionitis, the incidence of which varies from 3-15% of cases of PROM while fetal infection may occur as septicemia, pneumonia, skin infection, urinary tract infection or local infections such as, omphalitis (infection of the umbilical cord) or conjunctivitis, fetal infection occur in about 5% of all cases of PROM and in 15-20% of those with chorioamnionitis *(Benedetto et al., 2006)*.

Umbilical cord prolapse occurs more frequently in PROM with a reported incidence of 1.5%, it has now become clear that cord compression, even without prolapse, is more common in PROM because of the accompanying oligohydramnios *(Borna et al., 2005)*.

Other complications that may be associated with PROM include placental abruption, preterm labor and post partum infection *(Modena et al., 2004)*.

The false diagnosis of membrane rupture can lead to inappropriate intervention such as hospitalization or induction of labor. Therefore, it is highly desirable to establish a definite diagnosis of rupture of membranes in uncertain cases without delay however; traditional diagnostic methods and tests have some limitation and cannot be applied to all patients with 100% accuracy *(Buyukbayrak et al., 2004)*.

It is therefore important to achieve accurate diagnosis by identifying the presence of specific amniotic fluid markers in vaginal environment. These tests include measurement of vaginal pH, prolactin, α fetoprotein, di-amine oxidase, insulin-like growth factor binding protein-1 (IGFBP-1), human chorionic gonadotropin and fetal fibronectin. All these tests have advantages and drawbacks *(Esim et al., 2003; Kafali and Oksuzler, 2006)*.

It is known that creatinine concentration in the amniotic fluid increases gradually between 20 and 32 weeks of gestation and more rapidly thereafter, when they will be two to four times higher than maternal serum *(Tyden et al., 1998)*.

Oliveira et al. (2002) have found that creatinine concentration of 1.75mg/dl or more correlates significantly with a gestational age of 37 weeks or more.

Kafali and Oksuzler (2006) hypothesized that vaginal fluid urea and creatinine may be helpful in diagnosis of PROM because fetal urine is the most important source of amniotic fluid in the second half of pregnancy.

In their study, the sensitivity and specificity account up to 100% for both and it is approved by other studies concerning creatinine up to 90% and 100% respectively.

Accordingly, in the near future a vaginal dipstick may be designed to diagnose PROM in a reliable, simple, accurate and rapid way. Consequently, the simplicity of this test may make it attractive in our clinical practice.

AIM OF THE STUDY

The aim of this study is to evaluate the reliability of vaginal fluid urea and creatinine measurement for the diagnosis of premature rupture of membranes.
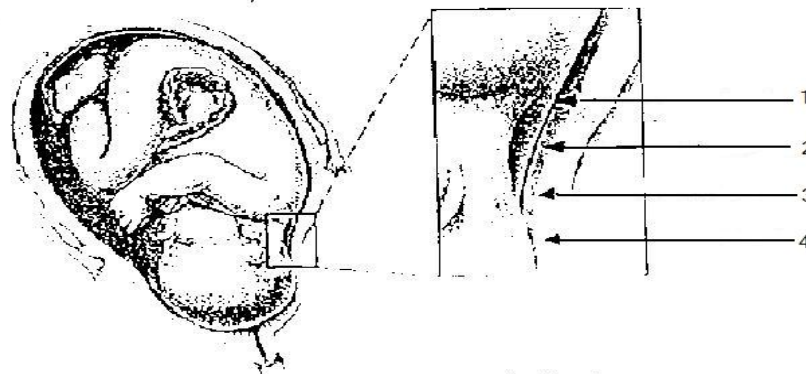
THE FETAL MEMBRANES

Fetal Membranes:

Chorioamnion, the membranes surrounding a fetus during gestation *(Michelle et al., 2005).*

Inspection of the fetal membranes following delivery reveals amnion that is mildly adherent to the fetal side of the chorion. Small amounts of maternal decidual tissue can be observed attached to the outer, maternal side of the chorion *(Cunningham et al., 2005).*

Anatomy of the amnion and chorion:

(1) Amnion   (2) Chorion
(3) Fetal Fibronectin   (4) Decidua

Figure (1): Fetal membranes: Anatomy *(Seth Guller, 2006)*.

Anatomy of the amnion:

Amnion is a thin translucent membrane. The fetal Surface of which is smooth and glistening. It is reflected from the root of the cord to the fetal surface of the placenta, and then at the margin of the placenta it is continuous to line the surface of the Chorion leave. Through the amnion three umbilical vessels can be seen imbedded in Wharton jelly, these are two umbilical arteries and one umbilical vein. The amnion is loosely attached to Wharton jelly except at the site of insertion of the umbilical cord in the placenta where they are firmly attached *(Mcparland and Bell, 2004).* It is divided into 3 parts *(Sagol et al., 2001):*

A- Placental amnion: covers the inner aspect of the placenta.

B- Dependent amnion: 1-2 cm overlying the internal os of the cervix.

C- Reflected amnion: the reminder part of the amnion.

Histology of the amnion:

According to *Mc Parland and Bell (2004)* the amnion consists of 5 layers the five layers from within outwards are:

1- *The epithelium:* This is normally composed of a single layer of apparently simple non ciliated cubiodal cells. probably it has functional role in the transport of water-soluble substances, beyond having a protective function.

2- *The basement membrane*: It is a narrow band of thin layer of reticular tissue lying along the base of epithelial cells to which it is adherent securely.