

## COMPARATIVE EVALUATION OF EVAPORATION TEST AND VARIOUS OTHER TESTS FOR DETECTING RUPTURE OF FOETAL MEMBRANES.

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### SUMMARY

The present study was conducted on two groups of 50 cases to evaluate the efficacy of various tests mentioned for prompt detection of ruptured membranes. It was found that no single test gave 100% accuracy regarding rupture of membranes. Evaporation test gave maximum accurate results i.e. 96% with no false positive result and with 4% false negative results. Nile blue test gave 94% accuracy followed by Fern test (91% accuracy) and pH determination (80% accuracy). The evaporation test was found to be cheap, risk free, very quick and simple.

### INTRODUCTION

The foetal membranes (Chorion-amnion) provide a protective covering to the foetus in utero, against various extraneous infections. Rupture of membranes with its accompanying problems has been a matter of debate as far as its diagnosis

and management is concerned. Occasionally it becomes difficult clinically to ascertain the condition of foetal membranes. In these cases diagnostic methods become of immense value. To date a number of tests have been devised but some of them are time consuming, costly and invasive but a few simple low cost reliable risk free and quick tests are : Evaporation

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Test, pH determination, Fern test and Nile blue sulphate staining. The present study was undertaken to evaluate the efficacy of these various tests for early and prompt detection of ruptured membranes.

#### MATERIAL AND METHODS

A total of 100 cases admitted to obstetric and Gynaecological department of Govt. Medical college, Amritsar were taken for study and were divided into two groups :

Group I - Control Group.

This included 50 cases in which foetal membranes were intact and there was no history of leakage.

Group II - Study Group.

This group included 50 cases in which there was a history of leakage

i.e. suspected cases of rupture membranes.

The samples were collected from :

1. Posterior fornix of vagina (vaginal pool) with a sterile soft pipette.

2. Few drops of endocervical material were collected from about 1 Cm. above the external Os with the sterile pipette.

A. Following tests were done on each sample collected from vaginal pool.

i. pH determination

ii. Fern test

iii. Nile blue sulphate staining.

B. Each sample collected from endo cervix was subjected to evaporation test.

#### OBSERVATIONS AND RESULTS

In the control group majority of the cases (76%) had an acidic pH and rest (24%) showed an alkaline pH.

TABLE I  
SHOWING RESULTS OF pH DETERMINATION  
IN CONTROL AND STUDY GROUPS

pH test	Number of Cases	Acidic	Alkaline
Control Group	50	38	12
Study Group	50	08	42

TABLE II  
SHOWING RESULTS OF FERN TEST

Groups	Number of Cases	Fern Test	
		Positive	Negative
Control Group	50	02	48
Study Group	50	43	07

TABLE III  
SHOWING RESULTS OF NILE BLUE  
SULPHATE STAINING TEST

Groups	Number of cases	Nile Blue Test	
		Positive	Negative
Control Group	50	01	49
Study Group	50	45	05

TABLE IV  
SHOWING RESULTS OF EVAPORATION TEST

Groups	Number of cases	Evaporation Test	
		Positive	Negative
Control Group	50	00	50
Study Group	50	46	04

On the other hand cases with clinical suspicion of ruptured membranes had acidic pH in 16% cases only and a large majority i.e. 84% in this group exhibited alkaline pH.

Fern test was positive in 4% and 86% cases in control and study group respectively. Negativity of the test was observed in 96% and 14% cases in control and study groups respectively. On amalgamating the data of all cases the fern test showed an accuracy of 91%. The test was false negative in 7% and false positive in 2%.

Nile blue test was negative in 98% of cases in the control group

and only 2% showed false positive result. However reverse was true in study group where 90% cases gave the positive results thus giving false negative test in only 10% cases. Thus in the whole series, accuracy came to be 94% followed by false positive in 1% and false negative in 5%.

Evaporation test was negative in 100% of cases in control group, no false positive results were seen. In the study group the test was positive in 92% of cases and false negative in 8% of cases. Accuracy of the test for the whole series was 96% with 4% showing false negative with no false positive results.

## DISCUSSION

In obstetrics one is frequently encountered with the problem of whether or not the membranes have ruptured. Quite often much depends on this point as to the subsequent course of treatment. So, one test or a battery of tests by which this information can be accurately determined would be of great value. The present study was undertaken to evaluate the efficacy of various tests mentioned for early and prompt detection of ruptured membranes.

### pH Determination

During latter part of pregnancy vagina has acidic pH (4.5-5.5); in the event of rupture of membranes the pH becomes alkaline. Using this principle, pH of vagina was tested in cases of both intact and ruptured membranes. For the whole series pH test gave an accuracy of 80% whereas false positive and false negative results were found in 12% and 8% cases respectively. The reported accuracy of pH test by various workers varies between 90 to 97.6% (Baptist, 1938; Friedman et al, 1969). Accuracy was considerably less in our series. This can be accounted for by high incidence of presence of heavy blood show, excessive vaginal discharge and prolonged rupture of membranes resulting in scanty liquor.

### Fern Test

In the present study accuracy of this test was 91%. False positive and false negative results were found

in 2% and 7% cases respectively. Our results are well comparable with those of Volet et al (1960) and Anjaneyalu (1967). Contrary to this workers like Neuhans (1956) and Paavola (1958) reported a very high accuracy, ranging from 96.6 - 100%. The lower accuracy of the test in our series can probably be due to excessive show, prolonged rupture of membranes, excessive vaginal secretions and meconium.

### Nile Blue Test

This test gave accuracy upto the tune of 94%. Brosens et al (1965) reported even a higher positive results, (98.2%). Saraf (1966) and Friedman et al (1969) showed 83.3% and 80.7% accuracy respectively. The variable results in these series maybe due to variable gestational age at the time of examination of specimen, because less than 10% fat containing cells are present at 36 weeks. Secondly, false positive are obtained with this test at term because of possible contamination with the fat contents of the maternal vulvar cells.

### Evaporation Test

This test in the present series showed 100% accuracy in the control group, with no false positive result. In the study group, the accuracy was 92% with false negative in 8% of the cases. In the whole series the accuracy was 96%. The false negative results may be explained as due to contamination of the cervical material

with the cervical mucous resulting in brown discoloration on heating. Our results are well comparable to those of Schiotz (1987) and Ianneta (1984).

The study proves that evaporation test seems to be convenient, cheap and risk free bed side approach for detecting ruptured membranes. It provides an immediate answer conveniently carried out during initial examination of the patient and can be easily combined with other simple vaginal tests like Nile blue sulphate test and Fern test which can be carried out in a side laboratory.

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