

# CERVICAL MUCUS FERNING: AN EASY & RELIABLE TEST FOR PLACENTAL DYSFUNCTION

(Preliminary study of 47 cases of suspected placental dysfunction)

by

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Various clinical and laboratory tests are available to evaluate fetoplacental unit and its dysfunction. Clinical parameters are inaccurate and are not precise. Laboratory methods are expensive, sophisticated and require expertise. Hence a simple method of cervical mucus crystallisation as a predictor of the hormonal status of the fetoplacental unit has been sought.

## Material and Methods

The present study was carried out at L.T.M.M.C./L.T.M.G.H., Sion, Bombay 400 022, for a period of 1 year from Jan. 1979 to Dec. 1979. A total of 47 patients with suspected placental dysfunction who were admitted to antenatal wards were included in this study.

Small quantity of cervical mucus was removed from the cervix with a sterile swab stick. Mucus was then spread on the slide. After drying the slide was examined under low magnification using light microscope to look for crystallization and cellularity.

Hormonal status of the fetoplacental unit was also assessed by serial 24 hour

urinary oestriol excretion and hormonal vaginal cytology.

Detailed History of the patient and antenatal examination including fundal height, abdominal girth at umbilicus and routine investigations were performed on admission. Clinical and laboratory parameters of fetoplacental function, and cervical mucus studies were performed at weekly intervals.

The ability of cervical mucus ferning to predict placental dysfunction was assessed by correlating it with other placental function tests like 24 hour urinary oestriol excretion hormonal cytology and outcome of the pregnancy.

## Results

Table I shows analysis of cases with suspected placental dysfunction regarding cervical mucus ferning, urinary oestriol excretion, hormonal vaginal cytology and outcome of pregnancy.

Twenty cases out of forty-seven had shown cervical mucus ferning repetitively during pregnancy. These included 9 cases of toxaeemias of various grades of severity, 4 of intrauterine growth retardation, 2 of postmaturity, 1 case each of twins, hydramnios and B.O.H. Cervical mucus ferning was also noticed in 1 case

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TABLE 1

*Cervical Mucus Ferning: Type of Placental Dysfunction; Other Tests and Outcome of Pregnancy*

Placental Dysfunction	No.	Ferning		Urinary Oestriol		Hormonal Cytology		Outcome		Small for Date
		Nil	tve	N	↓	N	↓	Live Birth	Still Birth	
Toxaemias										
Mild	16	15	1	14	2	12	4	15	1	—
Moderate	6	2	4	3	3	2	4	3	1	2
Severe	6	2	4	2	4	1	5	2	3	1
Diabetes	1	1	-	1	-	1	-	1	-	-
Twins	3	2	1	3	-	3	-	3	-	-
Postmaturity	5	3	2	3	2	3	2	4	-	1
Hydramnios	1	-	1	1	-	-	1	-	1	—
B.O.H.	3	2	1	1	2	1	2	2	-	1
I.U.G.R.	4	-	4	-	4	-	4	-	2	2
Missed Abortion	1	-	1	(Not done)		-	1	Evacuation for missed abortion		
Vesicular Mole	1	-	1	(Not done)		-	1	Aborted vesicular mole		
Total	47	27	20	28	17	23	24	30	3	7

( ↓ denotes decrease in placental function)

each of molar pregnancy and missed abortion respectively.

Table II shows the time of gestation at which the cervical mucus crystallisation was noticed for the first time and was present repetitively thereafter.

Outcome of pregnancy in cases who had shown repetitive cervical mucus crystalization showed 8 still births (showing signs of placental insufficiency), 7 small for date infants, 1 case each of molar pregnancy and missed abortion re-

TABLE II

*First Detection of Cervical Mucus Ferning: Weeks of Gestation*

Placental Dysfunction	No.	Wks. of gestation at which ferning appeared					
		10-14	15-20	21-28	29-32	33-38	38-40 & above
Toxaemias							
Mild	1	—	—	—	1	—	—
Moderate	4	—	—	—	3	1	—
Severe	4	—	—	—	4	—	—
I.U.G.R.	4	—	—	3	1	—	—
Postmaturity	2	—	—	—	—	—	2
Twins	1	—	—	—	—	1	—
Hydramnios	1	—	—	—	1	—	—
B.O.H.	1	—	—	1	—	—	—
Missed Abortion	1	1	—	—	—	—	—
Vesicular Mole	1	—	1	—	—	—	—
Total	20	1	1	4	10	2	2

spectively (Table I). No evidence of placental insufficiency could be demonstrated clinically, in 1 case each of moderate toxæmia; postmaturity and twins even when cervical mucus repetitively showed ferning.

When correlated with other placental function tests like hormonal cytology and urinary oestriol excretion it was found that out of 18 cases with cervical mucus ferning in late pregnancy, 15 showed significant fall in urinary oestriol excretion and 17 showed rise in K.P.I. Rise in K.P.I. was also seen in cases of vesicular mole and missed abortion. In addition to cervical mucus crystallisation, urinary oestriol was not done in these cases as they were in early weeks of gestation. In 3 cases of viz. moderate toxæmia, twins and hydramnios cervical mucus ferning was not associated with fall in urinary oestriol excretion. In 1 case each of mild toxæmia and B.O.H. respectively urinary oestriol showed significant fall but cervical mucus ferning was absent. In 3 cases of mild toxæmia, 1 of severe toxæmia, and one of B.O.H. rise in K.P.I. was not associated with cervical mucus crystallisation. In only 1 case of twins cervical mucus ferning was not associated with rise in K.P.I. Thus out of 17 cases of positive ferning, where outcome confirmed placental dysfunction,

vaginal cytology revealed placental dysfunction in all. Urinary oestriol was not done in cases of vesicular mole and missed abortion, and had shown significant fall in 14 cases. Hence correlation of cervical mucus ferning with cytology was 100% and with urinary oestriol levels was 93.2% (14 out of 15 cases) respectively (Table III).

Out of 27 cases who had not shown ferning of the cervical mucus at any time during pregnancy, not a single case had still birth or small for date baby.

#### Discussion

Many authors have described hormone dependency of cervical mucus ferning (Mac Donald, 1972). Zondek and Cooper (1954) found cervical mucus ferning in 11% of antenatal patients and was associated with higher incidence of abortion. According to Mac Donald (1972) absence of cervical mucus ferning was associated with no perinatal mortality and no small for date babies. But when cervical mucus ferning was detected after 16 weeks, perinatal mortality was 36.4% and incidence of small for date babies was 14.5%.

Deshmukh and Muzumdar (1978) report 6 cases which showed repeated ferning of the cervical mucus during

TABLE III  
Correlation Between Ferning, Oestriol Excretion and Hormonal Cytology

Outcome	No. of cases	Ferning		Urinary Oestriol		Hormonal cytology	
		Nil	tve	N	↓	N	↓
Still Born	8	—	8	1	7	—	8
Small for Date	7	—	7	—	7	—	7
Missed Abortion	1	—	1	(not done)		—	1
Vesicular Mole	1	—	1	(not done)		—	1

( ↓ means full in placental function)

pregnancy. Three out of them had abortion and 3 showed clinical signs of placental insufficiency and had small for date babies. In this series perinatal mortality rate was 40% and percentage of small for date infants was 35%, in cases who had shown repetitive cervical mucus ferning during late pregnancy. Cervical mucus had also shown crystallisation in 1 case each of molar pregnancy and missed abortion. There was not a single false negative report while false positive report rate was 15%.

Thus one can say that in a developing country like ours where costly and sophisticated tests for placental dysfunction are not easily available, cervical mucus

ferning can be used as a simple and fairly good screening test for placental dysfunction.

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*References*

1. Deshmukh, K. K. and Muzumdar, S. B.: J. Obstet. Gynec. India. 28: 572, 1978.
2. Mac Donald, R. R.: J. Obstet. Gynec. Brit. C'wealth. 79: 1087, 1972.
3. Zondek, B. and Cooper, K.: Obstet. Gynec. 4: 484, 1954.