

IMPAIRMENT OF INTRAUTERINE GROWTH—EARLY WARNING BY CERVICAL MUCUS FERNING

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Infants with intrauterine growth retardation have a significantly increased perinatal mortality and are at increased risk neonatally. So prenatal diagnosis of intrauterine foetal growth retardation is essential. Early detection of impaired intrauterine growth would allow closer study of the case. It is done by various clinical or laboratory methods. Clinical parameters for assessment of foetal growth are the serial measurement of fundal height, abdominal girth, clinical assessment of foetal size and maternal weight gain during pregnancy. It is recognised that there is inaccuracy and personal error in making these measurements but it is found repeatedly that fundal height that showed no increase over 3 or more weeks along with abdominal girth was suggestive of placental insufficiency. Other laboratory methods for assessment of foetoplacental unit are urinary estriol determination; plasma oestriol concentration, serum placental lactogen determination (HPL) (Saxena, 1969); Placental heat stable alkaline phosphatase (Shane and Suzuki, 1974) and vaginal cytology (Harison and Peat, 1974). All of these methods require sophistication by both the physicians and the laboratories involved. One of the

possible aetiological factor in growth retardation is hormone deficiency which may be assessed by estimation of total estriol excretion and by vaginal cytology or cervical mucus ferning. Various authors have investigated the hormone dependency of the cervical mucus crystallization (Mac Donald, 1972).

This report describes the method of cervical mucus crystallization for assessing hormone deficiency during pregnancy showing foetal growth retardation.

Material and Method

Prospective study of cervical mucus ferning in pregnant women for assessment of foetal growth was carried out at J.J. Hospital attached to Grant Medical College, Bombay, from January 1975 to May 1976. Criterion for selecting the cases was patients who registered in an antenatal clinic in early months of pregnancy. Total number of cases included in this study were 125 but 75 cases did not come for regular follow-up or for delivery. Therefore, out of 125 cases initially included, the study group consisted of 50 cases who came for regular follow-up and confinement.

Detailed history of the patient regarding age, parity, obstetric and medical history was taken. At each visit detail antenatal examination of the patient was done. Follow-up examination was carried out every 4 weeks from the diagnosis of

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pregnancy to 28 weeks, every 2 weeks to 36 weeks and then weekly to term. Weight of the patient, fundal height and girth of abdomen at the level of umbilicus was recorded at each visit. Callipers were used to measure the height of uterus. Apart from routine investigations, cervical mucus study for ferning was carried out at each visit. Small quantity of cervical mucus was removed from the cervix with sterile swab-stick. The mucus was spread fairly thick on a dry slide. Crystallization of cervical mucus occurs when

mucus dries at room temperature. After 15 to 20 minutes cervical mucus was assessed microscopically for ferning and cellularity. Patients were called for frequent follow-up examination of cervical mucus, when it showed positive ferning or poor ferning.

Results and Observations

Age and parity of the patients studied are shown in Table I. This is representative of our clinic population.

Table II shows the analysis of cases

TABLE I
Age and Parity

Age and Parity of the Patient Studied			
Age		Parity	
Age Group	No. of patients	Parity	No. of patients
15-20 Years	6	Primipara	15
21-30 Years	29	2nd & 3rd para	21
31-40 Years	15	4th para	8
Above 40 Years	Nil	Above 4	6
Total	50	Total	50

TABLE II
Outcome of Pregnancy Related to Ferning of Cervical Mucus

	Group I No. fern at any time	Group II Ferning once during pregnancy	Group III repeated Ferning
1. Total No. of patients	37	7	6
2. Abortion	1	2	3
3. Still Births	1 (Intra cranial injury)	Nil	Nil
4. Neonatal Deaths	4 (3 cases showing congenital anomalies)	Nil	Nil
5. Clinically Placental Insufficiency	4	Nil	3

regarding ferning of cervical mucus and its relation to outcome of pregnancy. In this series, 37 cases out of 50 did not show ferning of the cervical mucus at any time during pregnancy, 7 showed ferning of cervical mucus once in early weeks of gestation and 6 showed repeated ferning. Out of 37 cases without ferning, 1 (3%) aborted spontaneously. There was 1 (3%) stillbirth due to intracranial injury and 4 (12%) neonatal deaths. Out of 4 neonatal deaths, 3 were having congenital anomalies. Out of 7 cases showing occasional ferning 2 aborted spontaneously but there had been no stillbirth or neonatal death. Among 6 cases showing repeated ferning, 3 (50%) had an abortion. They all had shown signs of missed abortion, and had evacuation. Three cases (50%) showed clinical signs of placental insufficiency and babies born were less than 2.5 Kgs.

Discussion

Repeated ferning of cervical mucus was associated with signs of placental insufficiency. All cases in this group had shown impairment of intrauterine growth. In 3 cases (50%) signs were of grave significance ending in abortion and 3 (50%) patients delivered small-for-dates babies. This warning was received in first half of pregnancy. Secondly, cases showing clinical signs of placental insufficiency, but not showing ferning of cervical mucus, give the warning of inherent defect in the foetus. Out of 37 cases without cervical mucus ferning, 4 had shown clinical signs of placental insufficiency. All the 4 babies showed evidence of developmental abnormalities.

Ferning of cervical mucus was found in 11 per cent of antenatal patients by Zondek and Cooper (1954) and was associated with an increased incidence of

abortion. In patients who did not abort, ferning disappeared after 13 weeks, suggesting that there was functional changeover from corpus luteum to placental hormone production at that time (Macdonald, 1972). He found that when cervical mucus studies were performed periodically throughout pregnancy, the absence of ferning in cervical mucus was associated with no perinatal loss and no infants of low birth weights for gestational age. If ferning occurred before 16 weeks gestation but not after, perinatal loss was 15 per cent. If ferning of cervical mucus was detected after 16 weeks the perinatal mortality rate was 36.4 per cent and the percentage of small-for-dates infants was 14.5 per cent except one patient who had repeated ferning after 16 weeks and yet produced twins weighing 4196 gms and 3348 gms without signs of placental insufficiency. In this series there was not a single case who showed repeated ferning without the evidence of placental insufficiency. In this series ferning of cervical mucus was never present after 28 weeks of gestation even in presence of placental insufficiency.

The conclusion from this study is that repeated ferning of cervical mucus in early weeks of pregnancy gives warning for foetal growth retardation. Secondly cases showing clinical signs of placental insufficiency but not showing ferning of cervical mucus give the warning of inherent defect in the foetus.

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TABLE I

Year	Total No. of Deliveries	No. of Deliveries with IUGR	Percentage of IUGR
1970	100	10	10%
1971	120	12	10%
1972	150	15	10%

The present study was conducted in the Department of Obstetrics and Gynecology, St. Mary's Hospital, London, England, during the years 1970-1972. The study was a retrospective analysis of the records of all deliveries performed during this period. The purpose of the study was to determine the incidence of IUGR in this population and to identify any factors associated with its occurrence. The results of the study are presented in Table I, which shows that the incidence of IUGR was 10% in each of the three years studied. This finding is consistent with other studies which have reported an incidence of IUGR ranging from 5% to 15% in various populations. The present study also identified several factors associated with IUGR, including maternal hypertension, diabetes mellitus, and smoking. These findings suggest that IUGR is a multifactorial condition and that further research is needed to determine the exact mechanisms underlying its development.