

ACRIDINE ORANGE FLUORESCENT TECHNIQUE OF VAGINAL CYTOLOGY

Part II Prediction of Labour

by

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With an accuracy obtained by no other technique, the vaginal smear permits one to determine whether or not a pregnancy is at its biological term and as to how long it can continue without risk to the baby (Pundel 1959). Endocrine cytology can be helpful to the obstetrician in selecting patients who are likely to go into premature labour. It may also be an aid in determining whether induction of labour is necessary because of the danger to the foetus and whether an induction is likely to be successful. Several investigators believe that the onset of labour can be predicted by vaginal cytology (Pundel 1959, Lichtfus 1959, Leeton 1963, Barnes 1956, and Kamnitzer 1959). However, Birtch (1961) and Abrams and Abrams (1962) do not attribute any value to such studies.

Vaginal cytology was done in 38 women near term to establish the accuracy of prediction of labour. Vaginal smears were repeated at intervals of 3 to 5 days from 38 weeks of gestation till the onset of labour.

Observations

The last two weeks of pregnancy were

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termed "antepartum" phase. Three types of smears were observed during this period.

- A. "Prior To Term" smear
- B. "At Term" smear
- C. "Cytolytic" smear

The features are shown in fig. 1.

Characteristics of "Prior to Term" smears were the same as in the third trimester of pregnancy. In the "At Term" smear pattern the most important change was in the cell clusters. Throughout the earlier weeks of pregnancy the desquamation had been in sheets and plaques. About six days prior to delivery the desquamation of vaginal epithelium was more in the form of discrete and individual cells. The individual cell clusters became smaller. There was no change in the cell morphology. There was no significant change in the karyopyknotic index. Range was 0-15. The mean karyopyknotic index was 5. Mean maturation index of 0/95/5 was the same as in the third trimester smear. Mucus and a few leucocytes appeared in the picture. There was an increase in the number of Doderlein's bacilli and occasional cytolysis was also seen.

Table I shows the relationship of smear pattern to the onset of labour.

VAGINAL CYTOLOGY DURING ANTEPARTUM PHASE

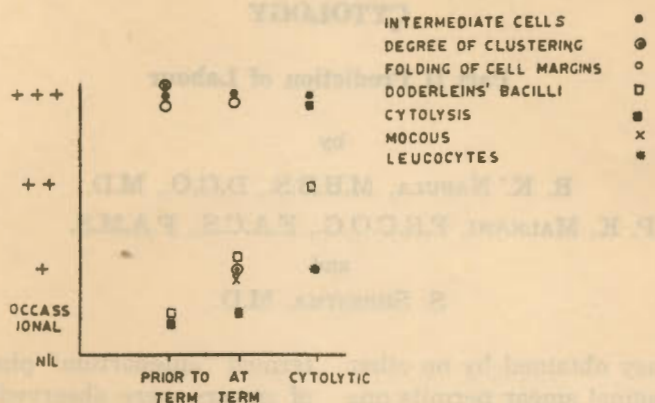


Fig. 1
Prediction of Labour
Vaginal cytology during antepartum phase.

TABLE I

The Relationship of Smear Pattern to the Time of Onset of Labour

| Type of smear | No. of cases | Onset of labour within 5 days | | Onset of labour after 5 days | |
|---------------|--------------|-------------------------------|-----|------------------------------|----|
| | | No. of cases | % | No. of cases | % |
| Prior to term | 10 | 2 | 20 | 8 | 80 |
| At term | 25 | 23 | 92 | 2 | 8 |
| Cytolytic | 3 | 3 | 100 | 0 | 0 |
| Total: | 38 | 28 | | 10 | |

"Prior to Term" smear was observed in 10 cases and only 2 (20%) of these went into labour within 5 days, "At Term" pattern was observed in 25 cases and in 23 (92%) of these labour pains started within 5 days. In three patients the smear pattern was "Cytolytic" and in all those spontaneous labour started within 5 days.

Comments

Cytology during the last two weeks of pregnancy was denoted as cytology "At Term" by Pundel 1959. Sammour 1964

called this period the "antepartum phase." Smear types observed during this period have been described as:

- (a) "Prior to Term" smear
- (b) "At Term" smear
- (c) "Cytolytic" smear
- (d) "Postpartum" smear

The frequency of smear types observed during the antepartum phase by several investigators is shown in Table II. No "Post partum" smear was seen in the present study.

TABLE II
Smear Pattern in Antepartum Phase

| Author | Prior to term | Type of smear | | Post partum |
|-------------------------------|---------------|---------------|-----------|-------------|
| | | At term | Cytolytic | |
| Lichtfus (1959) | 46% | 53% | — | 1% |
| Leeton (1963) | 59% | 37% | 4% | — |
| Osmond Clarke et al (1964) | 42% | 58% | — | — |
| Ghafoorzadeh et al (1967) | 70% | 28% | — | 2% |
| Present study | 26% | 66% | 8% | — |

According to Pundel (1959), Lichtfus (1959), Zidovsky (1961) the onset of labour can be predicted by vaginal cytology. The vaginal smear predicts the time of biological term rather than chronological term and is superior to Naegeles' rule in the prediction of labour (Leeton 1963). The percentage of correct predictions of onset of labour by vaginal cytology as observed by different workers is shown in Table III.

TABLE III
Prediction of onset of Labour

| Authors | Percentage of correct prediction |
|---------------------------|----------------------------------|
| Barnes and Zuspan (1956) | 75 |
| Pundel (1959) | 90 |
| Lichtfus (1959) | 90 |
| Montalvo-Riuz (1959) | 13 |
| Birtch (1961) | 20 |
| De-Neef (1962) | 50 |
| Sammour (1962) | 83 |
| Ghafoorzadeh et al (1967) | 78 |
| Present study | 82 |

Lichtfus (1959) after a study of more than 4800 smears from over 700 patients at or near the end of pregnancy, concluded that the "Prior to Term" smear permitted affirmation that the labour would not start within the next 5 days in 95%

of cases. He further stated that if the smear was of "At Term" type, spontaneous labour would start within 5 days in over 90% of patients.

In the present study of 25 cases with "At Term" smear, 92% went into labour within 5 days.

The accuracy of prediction of labour varies over a wide range as shown in Table III. Lichtfus (1959), Pundel (1959), found an accuracy of over 90%. De-Neef (1962) stated unequivocally that the vaginal smear permits the fixing of the date of delivery within a range of 2-5 days in 90% of cases and that no artificial induction of labour should be attempted if the vaginal smear is not "At Term". But Montalvo-Ruiz (1959) found that only 13 per cent of 1350 vaginal smears taken within 5 days of onset of labour showed the "At Term" pattern. Birtch (1961) and Abrams (1962) observed "At Term smears only in 29.3% and 20% respectively. They concluded that since colpocytology reflects oestrogen progesterone levels and since most investigators find no decrease in plasma or urinary levels of oestrogen and progesterone prior to term, there is no reason to expect significant cytological changes during 9th or 10th month. According to Pundel (1959) vaginal cytology is not a test for detection of every possible complication of pregnancy and deli-

very. Vaginal cytology only deals with hormonal function of the placenta and other causes of premature labour or foetal distress and death may exist such as toxæmia, hydramnios, erythroblastosis, placenta prævia and uterine tumour, which may go undetected.

Stricter criteria for a more reliable classification of the vaginal smears are desirable if vaginal cytology is to serve a useful index.

Summary and Conclusions

Vaginal smears from 38 women were studied during the last two weeks of pregnancy to determine the accuracy of prediction of labour by study of vaginal cytology with acridine orange fluorescent technique.

Three types of smears were observed "Prior to Term" smear, "At Term" smear and "Cytolytic" smear. The "Prior to Term" smear type suggests with an accuracy of 80% that the labour will not start within next 5 days. "At Term" type smear was an indication that labour was imminent within 5 days in 92% of cases.

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