

STUDY OF VAGINAL CYTOLOGY IN NORMAL AND ABNORMAL PREGNANCIES DURING THE THIRD TRIMESTER*

by

D. P. DAS, M. B., M.R.C.O.G.,

G. MUKHERJI, M.B.B.S., D.G.O., M.O. (Cal).

and

G. GANGULY, M.B.B.S., D.G.O., M.O. (Cal), M.R.C.O.G.

Vaginal epithelium is accepted as a very good indicator of circulating oestrogen and progesterone. During pregnancy, the amount of hormones increases enormously. Alteration of hormonal balance is believed to be a cause of onset of labour, both normal and abnormal. Certain complications of pregnancy e.g. toxæmia, diabetes, etc. are believed to have a hormonal background. These facts prompted cytologists to undertake extensive work to find out a normal pattern during pregnancy and how they are altered at the onset of labour, during and after labour and in different abnormal conditions. The method is cheap and available to all who are interested. The biochemical methods of assessing hormonal status are expensive, elaborate and still not full proof.

Foetal distress followed by intrauterine death is a great problem to obstetricians and particular attention was paid to find out any change in the vaginal cytology which could predict it to help the obstetrician to salvage the baby from the unhealthy environment or to find the means of reversing the process.

The present work was undertaken as a pilot study to gain experience in the

Department of Obstetrics & Gynaecology, Institute of Post Graduate Medical Education & Research, and S. S. K. M. Hospital, Calcutta.

**The paper was presented in the XVI All India Obst. & Gynaec. Congress: New Delhi.*

pattern of normal and abnormal pregnancies in our patients, in the light of various conflicting findings reported by different workers.

Material and Method

Vaginal smears were studied in different trimesters from unselected cases having normal and abnormal pregnancies. No serial study was undertaken. Here only the findings of last trimester is presented. Prior to taking smears all cases were subjected to history taking and general and obstetrical examinations. All doubtful cases were excluded from this study.

Materials were obtained by means of swabs from the lateral vaginal wall under a speculum and immediately spread over a slide, fixed in equal proportion of ether and absolute alcohol and stained by Shorr strain in the usual way.

The smears were studied for the following features—number of superficial karyopyknotic cells, navicular cells, intermediate cells and parabasal cells. Notes were taken of the amount of clumping or appearance of discrete cells, as also of leucocytes and R.B.C. The counts were expressed in percentages. The amount of clumping was denoted by ++, + or nil according to the degree.

Cases were studied under the following groups:

TABLE I
Groups

Total No. of cases	—	300 cases
1. Normal pregnancy	—	150 "
2. Toxaemia of pregnancy	—	60 "
3. Prolonged pregnancy (290-300 days)	—	40 "
4. Premature labour (Before 37 weeks)	—	50 "

Smears are described as

Grade I—changes observed prior to last two weeks.

Grade II—changes observed during last two weeks.

Grade—I shows

(i) Intermediate cells comprising most with navicular cells predominating.

(ii) Clumping ++.

(iii) Superficial cells, less.

Grade—II

(i) Gradual diminishing percentage of navicular cells.

(ii) Clumping—decreasing.

(iii) Superficial cells, increasing.

Observation

superficial pyknotic cells increased from 3.9 to 8.9 per cent. The clumping also showed gradual diminution. The amount of parabasal cells which appeared towards the end were not significant. Few discrete cells were also observed. Leucocytes and R.B.C. were rarely found (Fig. 1).

Onset of Labour—80 cases—who started labour spontaneously at term.

TABLE III

Relation to Types of Smear

Type of Smear	No. of cases	Onset of labour within 5 days of taking smear (%)
Smear showing		
1. Changes before last 2 weeks (Gr. I)	23	27.7
2. Changes of last 2 weeks (Gr. II)	54	72.3

This shows 72.3 per cent cases could be correlated with the type of smear showing Grade—II (Fig. 2 & 3).

TABLE II
Normal Pregnancy 150 Cases

Pregnancy in weeks	No. of cases	Sup. Kar-yopyknotic cells (%)	Inter-mediate cells (%)	Navi-cular cells (%)	Para-basal cells (%)	Clump-ing
28-36	50	3.9	96.1	82	0	++
37	20	5	95	76	0	++
38	20	6.35	93.5	70	0.15	++
39	30	8	93	52.2	0.7	+
40	30	8.5	90.5	35.2	1	+

It appears from the above table that with progress of pregnancy the percentage of intermediate cells decreased from 96.1 to 90.5% while percentage of navicular cells came down from 82 to 35.2%. The

Premature Labour—50 cases.

Smear patterns were studied in 50 cases which terminated in premature labour. Smears were taken within 5 days or at the onset of labour.

TABLE IV

Premature Labour in Relation to Type—50 Cases

Type of Smear	No. of cases	Onset of labour within 5 days of taking smear (%)
Smear showing—		
1. Changes before last 2 weeks	15	30
2. Changes of last 2 weeks	35	70

Table—IV shows that 70 per cent revealed Gr. II smear.

TABLE V

Prolonged Pregnancy (290-300 days)—40 Cases

No. of Cases	Sup. Karyopyknotic cells (%)	Intermediate cells (%)	Navicular cells (%)	Parabasal cells (%)	Clumping
40	9.1	89.9	32	1	+

TABLE VI

Toxaemia 60 cases

Pregnancy in weeks	No. of cases	Sup. Karyopyknotic cells (%)	Intermediate cells (%)	Navicular cells (%)	Parabasal cells (%)	Clumping
Upto 38	44	4.5	95	78	0.5	+
39 - 40	16	6.7	92	36	1.3	+

The findings in the above two groups do not materially differ from the normal group.

Discussion

The changes in the pattern in normal and abnormal cases have been described. In our work the criteria used for the prediction of onset of labour were mainly—

(1) Increase of superficial cells percentage.

(2) Decrease in navicular cell percentage.

(3) Decrease in amount of clumping.

Changes in the percentage of navicular cells appeared to be the most important.

Pundel and Lichtfus (1959) found that with their 'at term' smear more than 90% delivered within 5 days. Nyklicck (1959) and Riotton *et al* (1950) had similar experience. Parikh *et al* (1967) could predict 80.9% onset of labour.

But all the workers do not agree with above results. Luis Montalvo Ruiz *et al*, (1959) found difficulty in correlating. Abrams (1962) failed to notice any cellular alteration that might enable predic-

tion of onset of labour.

In our series 72.3 per cent correlation could be observed. This difference between other authors and our series is probably related to less number of cases and lack of adequate experience for a long period.

The findings in our series reveals no significant difference in the prediction of normal and premature labour. This is an interesting finding in the sense that some of the premature labour cases perhaps developed a hormonal alteration at earlier

months of pregnancy.

This pattern is seen in the normal pregnancy cases between 38—40 weeks.

We have no biochemical data to support our conclusion that such hormonal alteration in premature labour is really the important factor. This will be an interesting study. This is further supported by the findings of Kumar 'Azoury and Barnes who noted less progesterone in the placentas of majority of cases of premature birth than in those delivered at term.

Women who have a past history of premature delivery will be good subjects for further study and we propose to undertake it in future.

We had 60 and 40 cases of toxæmia and prolonged pregnancy cases respectively in our study. We did not get any significant change in the cytology from the normal group.

In 20 per cent of our series who went into labour, foetal distress was observed but in none we could definitely correlate it with any cytological abnormality.

It appears that there is a lot of controversy in the interpretation and correlation in the cytological findings by different workers and they emphasize the importance of different parameters. This leads us to believe that possibly each patient has her own type reflected in cytology and a serial study in them might improve interpretation.

Summary

Vaginal cytological report of 300 cases during the third trimester is presented—under the followed groups.

One hundred and fifty normal cases revealed a definite change in the pattern as duration progressed.

Onset of labour: 72.3% could be correlated in term labour cases and 70% in premature group.

Prolonged pregnancy: 40 cases and toxæmia 60 cases.

No significant departure from normal.

Foetal distress was noted in 20% of cases that went into labour, but no definite correlation could be observed with cytological findings.

Acknowledgement

We are thankful to the Director, Institute of Post Graduate Medical Education and Research, the Surgeon Superintendent, S. S. K. M. Hospital, Prof. J. K. Chatterjee, Prof. Director of Obstetrics & Gynaecology, Staff of Gynae Research Unit, particularly Mr. K. Zaman and Miss. Debika Samaddar for their kind help and cooperation.

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See Figs. on Art Paper II