

VAGINAL CYTOLOGY IN THREATENED ABORTION (STUDY OF KPI BY MICROMETRIC METHOD)

by

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The foetal wastage from spontaneous abortion has been estimated to be six to eight times greater than that from all other late complications of pregnancy combined. It is evident that many of these are due to endocrinal disturbances. The relationship between a properly prepared endometrium and healthy trophoblast is crucial in determining successful transplantation of ovum. No single technique of assessing the endocrine status of pregnancy is entirely satisfactory. For wide applicability a simple procedure such as vaginal cytology is very useful. The vaginal epithelium responds earlier and with more sensitivity than any other accessible site. Papanicolaou in 1925 demonstrated the changes seen during pregnancy as revealed by vaginal smear. The introduction of numerical criteria by Gaudefroy in 1950 brought a new era in this field. Outstanding work on hormone cytology in abortion has been done by Pundel 1959; Hochstaedt *et al*, 1960; Nesbit *et al* 1961. The general agreement is that high % of Karyopyknotic cells is an index of severity of progesterone deficiency. Opinions also differ on which nucleus is to be labelled as pyknotic.

Pundel (1959) considered a nucleus of 6 micron or less to be pyknotic. In this study, to avoid subjective error, a micrometric method is employed to measure the size of the nucleus.

Material and Methods

One hundred and ten cases of threatened abortion with history of 12-20 weeks gestation and vaginal bleeding were included.

The smears were taken from upper 1/3rd of the lateral wall of vagina. Repeat smears were done if, (1) too many red blood cells obscured the field, (2) in case of cytolytic smear after a 10 days course of gynestron. The smears were stained by papanicolaou method and were read with emphasis on following points:

1. Type and amount of exfoliation and calculation of KPI. KPI was calculated by counting a total of 200 cells. A micrometer scale in conjunction with eye piece screw micrometer was so adjusted that any nucleus with its greatest diameter in two lines of scale was of 6 μ size (Fig. 1) and hence counted as pyknotic.

2. Type of clumping of cells were recorded. It was labelled as good if 5 or more cells were seen in single group, moderate if number of cells were 3 to 5 and poor if no clumping was seen.

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3. Presence of red blood cells and inflammatory exudate.

4. Presence of cytolytic.

5. Presence of decidual or trophoblastic cells.

of these 4 cases 3 gave previous history of abortion. Table III shows outcome of cases with cytolytic smears and its relation with previous obstetric history.

Observations

Cases were classified into four groups depending upon the KPI. Table 1 shows number of cases in each group and the abortion rate. It is seen that 100% abortion rate is seen in group of KPI above 20%.

Good navicular clumping did not affect abortion rate when the KPI reading was high (Table II).

Eleven cases showed initial cytolytic smears which did not improve with treatment. Out of these, 4 cases aborted and

Discussion

Cytologically detectable hormonal disturbance during pregnancy is usually seen when the equilibrium between proliferating hormone estrogen and desquamative substance progesterone is altered in favour of the proliferating hormone (Weid 1968). Smears of conception generally exhibit the most marked degree of proliferation. This eventually changes to the less proliferated pattern. Upto 3rd month the number of navicular cells are few and KPI may be quite high (20-30%). From third month onward folding and crowding of cells in-

TABLE I
Correlation of KPI With Abortion Rate

KPI	No. of cases	Aborted	Continuel	Abortion rate
0-10	40	6	34	15%
11-20	27	10	17	27%
21-30	18	18	0	100%
above 30	14	14	0	100%

TABLE II
Correlation of Navicular Clumping and Abortion

Type of clumping	KPI 11-20%			KPI 21-30%			KPI above 30%		
	No.	Abor.	Cont.	No.	Abor.	Cont.	No.	Abor.	Cont.
Good	14	1	13	4	4	0	0	0	0
Moderate	7	3	4	0	0	0	2	2	0
Poor	6	6	0	14	14	0	12	12	0

TABLE III
Outcome of Cytolytic Smears

Obst. history	No. of cases	Aborted	Continued	Abortion rate
Primigravida	4	0	4	0%
With previous H/o abortion	4	3	1	75%
Without previous H/o abortion	3	1	2	25%

crease substantially. The superficial cells decrease in number and the percentage of eosinophilic index and karyopyknotic index becomes less than 10%. The progress from cell type existing at conception to the ideal cytohormonal pattern of pregnancy is slow in one and rapid in others (Hochstaedt *et al* 1960). Thus evaluation is more meaningful if vaginal smears before the start of abortion is available. The problem becomes still more complicated by use of different type of indices, for example, KPI (Pundel, 1968; Nesbit, 1961); acidophilic cell index Menon *et al*) and Maturation Index (Endley and Engineer).

The level of KPI at which smear is considered abnormal is also not agreed upon. Pundel, (1968) considers smear with KPI upto 10-20 as normal. In this series, the 100% abortion rate at 30% KPI is in agreement with most workers.

In 21-30% KPI group, there is 100% abortion rate while Menon *et al* showed with 40-50% acidophil cell count an abortion rate of 85%. In Nawal Kishor's (1957) series in similar group, the abortion rate was 84%.

In 11-20 KPI which can be labelled as mild progesterone deficiency, the abortion rate was 37% which is similar to N.

Kishore (1957) of 40%. In 0-10 KPI, 15% abortion rate is in agreement with that of 12% of N. Kishore (1957). Endley and Engineer (1967) in similar group had abortion rate of 31.88%.

Cytolysis indicates generally a good smear. Pundel (1959) in his series of 450 cytolytic smears had no case of abortion. In the present series, no abortion occurred in cytolytic smears belonging to premigavidae. The influence of good clumping was seen in smears with low KPI only.

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See Figs. on Art Paper I