SINGLE ENDOMETRIAL ASPIRATION

(An easy and reliable test in Infertility Work up)

by

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SUMMARY

This study was undertaken to evaluate the place of endometrial aspiration in detection of ovulation.

Introduction

There are various tests to detect ovulation viz. basal body temperature, cervical mucous study, hormonal vaginal cytology, endometrial biopsy, urinary or plasma progesterone by radioimmunoassays, and ultrasound. The detection and pinpointing the ovulation is an important landmark in the infertility work up of the female.

Daily vaginal smears, monitoring of basal body temperature, cervical mucus study require careful monitoring of the patient over a prolonged period of time. Patient should be regular in her attendance. The sophisticated tests such as estimations of urinary or plasma progesterone by radioimmunossay and ultrasound require expertise, expensive instruments, and special set up which lacks in most of the institutions in our countary. Endometrial biopsy although simple and inexpensive is quite painful and repeated endometrial biopsies are cumbersome.

The underlying principle of this study is that one can easily identify the endometrial columnar cells in the proliferative or secretory phase in the aspiration smear and that if the ovulation does not occur the endometrium remains in the proliferative phase.

This was subsequent to our study for screening of patients for endometrial carcinoma by endometrial aspiration. During the study we could easily identify secretory and proliferative phases of the cycle by looking at the aspiration smear.

Material and Methods

The material for the study was obtained from the out-patient department of B.Y.L. Nair Ch. Hospital and T.N. Medical College. An endometrial aspiration smear was obtained on day 23 ± from the women undergoing infertility investigations. In the begining of the study the aspiration was taken by using 4 mm. menstrual regulation cannula and

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syringe. In the later part of the study we have used insemination cannula attached to the 20 cc. luer lock syringe. The smear was made on the slide and slides were fixed in ether alcohol mixture in coplin's jar. The slides were later stained by papanicolou's stain.

The results of the study were correlated with other parameters, B.B.T., E.B., vaginal smears, and cervical mucus study.

Results

Table I shows correlation between endometrial biopsy and endometrial aspiration cytology. In 40 cases endometrial aspiration cytology showed secretory pattern, whereas biopsy confirmed it in 37 and showed proliferative pattern in 3 of them. In 10 cases in whom cytology was proliferative, endometrial biopsy was proliferative in 7 and secretory in 3 cases. Thus in 44 (88%) of cases cytology and biopsy tallied with each other and there was disparity in 6 (12%) of the cases. In 3 cases where cytology was proliferative and biopsy was secretory, the cytology was taken earlier, 20th, 21st and 23rd day of the cycle respectively. Probably typical secretory pattern may not have developed early in the cycle. In the remaining 3 cases in whom cytology was secretory but biopsy showed proliferative phase there is no explanation to offer except that the smears were inadequate.

TABLE I

Correlation Between E. A. Cyto'ogy and E. B.

E. A. Cytology	(No.)	E. B. Secretory	E. B. Proliferative
Secretory	(40)	37	3
Proliferative	(10)	3	7
Totai	(50)	(40)	(10)
False positive Rate		6%	
False negative Rate		6%	

Table II shows correlation between serial vaginal cytology and endometrial aspiration cytology. In 37 cases serial vaginal cytology and aspiration cytology revealed ovulation (secretory pattern). In 13 cases vaginal cytology showed an ovulatory pattern, while aspiration cytology could confirm the same only in 10 cases. There was discrepancy between the two in 3 cases i.e. (6%). Here vaginal cytology was anovulatory but aspiration cytology revealed secretory pattern. These may be the cases of corpus luteum showing poor hormonal pattern in vaginal smear. In these cases cervical mucus also showed anovulatory pattern. There was descrepancy between cervical mucus study and aspiration cytology in 6% of the cases.

TABLE II

Correlation Between Serial Vaginal Cytology, Cervical Mucus Study and Endometrial Aspiration

Serial vaginal cytology and cervical mucus study	(No.)	Endometrial aspiration cytology Secretory	Proliferative
Ovulatory cycle	(37)	37	—
Anovulatory cyele	(13)	3	10
Total:	(50)	(40)	(10)

Discussion

Review of the literature shows that use of endometrial aspiration smear has been limited to detection of endometrial hyperplasia and malignancy. Even standard text books on cytopathology mention the same.

The endometrial columnar cells in the cytology smears were first described by Peter *et al* in 1952 and later on by Chandra Grubb (1977). These studies showed that one can easily identify the columnar cells in the secretory and proliferative phases. However, none of the studies correlated this with histopathology and other methods to detect ovulation.

This study was subsequent to earlier study on endometrial aspiration (Ambiye *et al* 1981) reported in this Journal, in which it was easy to identify secretory and proliferative cells in the aspiration smear and confirm it on curretage report. The columnar cells in the proliferative phase are closely packed, have a well preserved round hyperchromatic nucleus and very little cytoplasm. Those in the secretory phase have a large distinct vacuole that occupies the whole of the cytoplasm and pushes the nucleus to the bottom or to the side. This being similar to any secretory (Goblet) cell. Figs. 1 and 2). Since the secretory activity can only take pace after ovulation the presence or absence of secretory pattern could confirm or deny ovulation.

We have correlated the endometrial smear report with serial vaginal cytology, B.B.T., cervical mucus study and above all with endometrial biopsy on first day of menstruation. It was correct in 88% of the cases in correlation with endometrial biopsy. In cases where it were proved wrong, either the smears were inadequate or were taken early in the cycle. Since the secretory pattern may not develop early in the cycle we now advocate aspiration smears late in the cycle viz. 25 $\pm$ 2 as compared to 23 $\pm$ 2 in the present study. This will reduce the false positive and negative reports.

In the begining of the study we used menstrual regulations cannula (4 mm) and syringe for taking endometrial aspiration. However, the smears used to be very thick and it was difficult to interprete. Therefore, in the later part of the study we started taking smears with insemination cannula and 20 cc. syringe. The smears using cannula and 20 cc. syringe were satisfactory hence we continued to use the same in the later part of the study.

In one case we detected giant cells in the smears arousing the suspicion of tuberculosis which was later on confirmed on biopsy report.

Conclusion

Although it is not possible to pinpoint ovulation by endometrial aspiration cytology. One can definitely confirm or deny ovulation. It can replace endometrial biopsy, particularly so in patients with irregular cycles. It also can help in trials of various hormonal contraceptives in predicting whether ovulation is suppressed or not.

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See Figs. on Art Paper IV