

ENDOMETRIAL ASPIRATION: AID IN DETECTION OF OVULATION

by

PURNIMA K. NADKARNI,* M.D.
PUSHPA H. KHILNANI,** M.Sc.
USHA R. KRISHNA,*** M.D.
ARUN R. CHITALE,† M.D.

and

VITHAL N. PURANDARE,†† M.D., F.R.C.S.

Introduction

Ovulation is a very important phenomenon in the reproductive life of a woman. Infertility requires the detection of this event to determine sexual behaviour that will preclude pregnancy.

Ovulation can be detected by different parameters such as cervical mucus, basal body temperature chart, serial vaginal smears, endometrial biopsy, measurement of LH surge and measurement of plasma progesterone by radio-immunoassay.

Serial vaginal smears, cervical mucus and BBT charts require daily monitoring of patients for a long time. Accuracy of these parameters reported in literature is 70-80%. One can reach a definite conclusion whether ovulation has occurred or not by estimation of LH surge at midcycle as well as plasma progesterone from 20th to 24th days. However, these radioimmunoassays are expensive and other practical easy and inexpensive

methods of judging ovulation need to be evaluated.

Endometrial biopsy is most accurate and inexpensive O.P.D. procedure but it is an uncomfortable O.P.D. method and cannot be repeated more than once in the same cycle nor every month.

This study was therefore undertaken to compare endometrial aspiration, with endometrial biopsy or dilatation and curettage. An attempt was made to detect ovulation in 130, regularly and irregularly menstruating infertile women, by studying a single endometrial aspiration taken just before endometrial biopsy or premenstrual dilatation and curettage and laparoscopy. Diagnostic accuracy of endometrial aspiration done with Isaac's Cell Sampler was compared with endometrial biopsy and dilatation and curettage.

Place of endometrial cytology in detection of endometrial malignancy is well known. Here, an attempt is made to indicate that there is a place of endometrial aspiration in detection of ovulation as well.

Material and Methods

One hundred and thirty patients, in reproductive age group (19-37 years) attending Gynec. O.P.D. at K.E.M. Hospital, Parel, Bombay, for infertility were studied.

*Registrar.

**Jr. Scientific Officer.

***Honorary Associate Professor.

†Cytopathologist.

††Head of the Department.

Department of Obstetrics and Gynaecology,
K.E.M. Hospital and Seth G.S. Medical College,
Bombay 400 012.

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Detailed history, general, physical and local examination was made. An endometrial aspiration was taken just before performing endometrial biopsy in irregularly menstruating patients and before doing premenstrual dilatation and curettage and laparoscopy in regularly menstruating patients.

Endometrial biopsy was carried out with the Isaac Cell Sampler, a flexible metal cannula 1.9 mm in diameter which can be inserted upto 7 cm into the endometrial cavity (Fig. 1). It contains multiple holes for sampling. A cervical shield seals the cervical os to help to create a vacuum for aspiration of endometrial material and also prevent cellular contamination from the cervix. A plastic sheath covers the cannula during insertion and withdrawal to prevent further contamination. A regular syringe is attached to the end of the cannula for aspiration. Its use does not require anaesthesia. The aspiration material is smeared on the clean glass slide which is immersed in fixative and stained by Papanicolaou technique.

Method of Interpretation of endometrial cytology

Descriptions of the endometrial columnar cells in the proliferative and secretory phases have been made by Peters *et al* in 1958 and recently by Grubb (1977). We have used these criteria for diagnosing secretory phase or proliferative phase. Endometrial cells in secretory phase can be identified easily by a large, distinct secretory vacuole occupying almost all the cytoplasm distorting the nucleus (Fig. 2). This activity is seen only after ovulation.

The proliferative type cells are closely packed and have a well preserved, round, hyperchromatic nucleus and very little cytoplasm (Fig. 3). Hence when such cells are seen predominantly in cytology one can conclude that the cycle was anovulatory.

Histopathological interpretation was done by standard methods.

The results of cytology were compared with histopathology of the endometrium of the same patients.

Results

The results of our observation are shown in Table I.

TABLE I
Cytological and Histopathological Correlation

CYTOLOGY Cell types	Total	HISTOPATHOLOGY Cell types					Unsatisfactory
		Secretory	Proliferative	Atrophic	Mixed	Hyperplasia or abnormal	
Secretory	71	65	2	—	—	2	2
Proliferative	38	5	31	—	—	—	2
Atrophic	1	—	—	1	—	—	—
Mixed	3	1	—	—	—	2	—
Hyperplasia or abnormal	3	1	2	—	—	—	—
Unsatisfactory	14	3	1	—	—	—	10
Total	130	75	36	1	0	4	14

By cytology we correctly interpreted a secretory endometrium in 65 out of 75 cases confirmed by histopathology (86.66%). Similarly, of the 36 cases of proliferative endometrium, our cytologic interpretation was correct in 31 cases (86.11%).

The incidence of unsatisfactory smear was about 11% especially in presence of active uterine bleeding when very few cells were obtained. In the same group of 14 cases, endometrial biopsy was unsatisfactory as well in 10 of them. Two cases of tuberculous endometritis were missed by cytology and diagnosed by histopathology.

Helix have been tried with accuracy rates ranging from 66-97% (Underwood *et al* 1973; Vuopula *et al* 1977).

Hutton *et al* (1978) using the Isaac Cell sampler, obtained a correlation of 95% between the histologic and cytologic diagnosis and correlation of 100% in the 6 cases of adenocarcinoma that were present.

We have come across only one reference on the usefulness of endometrial cytology for detection of ovulation. Zubair *et al* (1981) had an accuracy of 92% in detection of ovulation by endometrial aspiration which inspired us to undertake this study.

By cytology we correctly interpreted

TABLE II
Results with Isaac Cell Sampler

Endometrial cell types	Cytologic diagnosis	Histologic diagnosis	Comments
Secretory	71	75	2 cases misdiagnosed as proliferative and 2 as cystic glandular hyperplasia by cytology
Proliferative	38	36	False positive 2; were secretory by histology
Atrophic	1	1	
Mixed	3	0	
Hyperplasia TB, malignancies etc.	3	4	2 cases of tuberculous endometritis were missed
Unsatisfactory	14	14	
Total	130	130	

Discussion

Following the widespread acceptance of the use of vaginal and cervical cytology in screening for cervical cancers great expectations have been raised to screen for endometrial cancer by the various cytological techniques.

The various methods of endometrial screening such as a uterine aspiration smear, endometrial brush technique, Gravlee jet washer, Vabra aspirator, metal cannula; Isaac Cell Sampler, Mi-Mark

ovulation in 86.66% cases and anovulation in 86.11% cases.

The lack of correlation in 13.4% of our cases may be because, normal endometrial cells are very cohesive and have limited exfoliation, while malignant and hyperplastic cells being less cohesive are more easily exfoliated. Another drawback being, use of cytological detection technique is still basically limited by the experience of cytopathologists. With more and more experience in endometrial cytology this error can be reduced.

Though not completely replacing conventional dilatation and curettage under anaesthesia or endometrial biopsy, O.P.D. uterine aspiration offers many advantages. It is safe, simple, quite accurate and a painless O.P.D. procedure. One can obtain fairly representative sample from endometrial cavity including tissue fragments.

Though it is not always possible to pinpoint ovulation with this method, the aspiration can be repeated in many cycles and many times in one cycle, especially when the patient is on ovulation inducing drug. It will not disturb an implanted ovum and being painless, is more acceptable to patients on cyclical clomiphene and human menopausal gonadotropin therapy. It can also be an additional parameter to study the effect of various methods of hormonal contraception on ovulation.

Two cases of tuberculosis were missed by cytology. Therefore, in our country, where tuberculosis is an important cause of infertility in females a thorough dilatation and curettage and histopathological study is mandatory at least once. Endometrial aspiration will be a useful aid when follow-up is necessary for detection of ovulation.

We have now undertaken a study of serial endometrial cytology to detect ovulation in Endocrine O.P.D. patients who are on ovulation inducing drugs.

Summary

An attempt was made to detect ovulation in 130 infertile women by studying single

endometrial aspiration taken just before endometrial biopsy or premenstrual dilatation and curettage and laparoscopy. 86.5% correlation was obtained between histology and cytology.

Endometrial aspiration by Isaac Cell Sampler is an easy, quick and accurate O.P.D. procedure in detecting ovulation especially for patients on ovulation inducing drugs.

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See Figs. on Art Paper III