

THE VALIDITY OF THE UROCYTOGRAM COMPARED TO COLPOCYTOLOGY IN HORMONAL CYTODIAGNOSIS

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As is known, the utility of colpocytology in the endocrinological field depends on the correlation existing between the degree of cellular proliferation and maturation of the vaginal epithelium, and the secretion of ovarian hormones. Nonetheless, the presence of vaginal inflammation, excessive cytolysis due to *Bacillus vaginalis*, bloody discharge, or spermicidal substances present limits to correct cyto-hormonal evaluation due to modifications in the staining properties of the cytoplasm that thus derive.

For this reason, the urocytogram is gaining wide acceptance (^{1, 2, 3, 4, 5, 6, 8, 10, 11, 14}) since it is a method of hormonal evaluation based on the percentage study of the various cell types, exfoliated by the trigone of the bladder and the urethra, found in urine.

Compared to the vaginal specimen, it presents many advantages which may be summarized as follows:

1. The urocytogram does not require the presence of the gynecologist or nurse since the patient herself may collect her urine and send it to the laboratory. Thus, psychological distress deriving from vaginal collection are avoided, especially in children and adolescents. Moreover, this examination may be carried out in women that are immobilized in bed.

2. Cells remain unaltered in the urine for up to four hours, while vaginal specimens require immediate fixation.

3. Cytological study of urinary sediments may be performed in the presence of several developmental anomalies of the genital system that do not permit colposcopy examination, such as vaginal atresia, various forms of pseudo and true hermaphroditism.

4. Urocytogram interpretation is not negatively influenced by factors such as coitus, menstrual flow, endouterine secretions, topical anti-inflammatory or spermicidal treatment, and radiotherapy.

SUMMARY

The AA. studied the degree of significance in results obtained from a parallel urocytologic and colpocytologic study in sixtytwo regularly menstruated women.

The analysis of the data showed a significant correspondence between the results of both procedures regarding the karyopyknotic index, although the curve obtained by urocytogram was constantly lower than that one by colpocytology.

From the study it emerges clearly the validity of urinary cytology for hormonal evaluation as alternative to colpocytology where the evaluation is often negatively influenced by many local factors.

5. Cytomorphological alteration of cells by saprophytic and pathogenic bacterial flora is a rare finding in the urocytogram. In fact, inflammation due to *Trichomonas vaginalis*, which is present in up to 25% of colpocytological examinations and is rare in the urocytological exams, determines pseudo-eosinophilia and the appearance of a typical pale perinuclear halo in many intermediate cells, and thus modifies the reading of the slide. *Bacillus vaginalis* instead determines marked cytolysis in about 9% of normally menstruating women and 65% of pregnant women. Cytolysis due to *Bacillus vaginalis* is conditioned by a vaginal pH oscillating between 3.8 and 4.5, a rare event in urinary sediment cells where the pH ranges from 5 to 7.

6. Urocytogram is a valid diagnostic alternative to colpocytology in all those cases presenting metrorrhagia and in which an endocrine dysfunction is the suspected cause.

7. Urocytogram may be employed in all those cases where the colposcopic procedure is difficult or impossible due to narrowing of the vaginal canal or presence of parakeratotic-cicatricial cytological alterations following vaginal surgery.

8. Graham's radiosensitivity test may be carried out in the presence of radium-treated cervical carcinoma which is characterized by the appearance of radiation cells with specific features and whose percentage has a prognostic significance. This test is difficult with colposcopy due to the inflammatory-necrotic phenomena present in the vagina.

Pollosson⁽¹²⁾ reports that typical megacytes appear following the first day of radium therapy.

9. Urocytogram offers better control of the estrogen action on the bladder mucosa of women treated for cystalgia and urinary incontinence.

10. Finally, navicular cells and antepartum cells of pregnancy appear in the

urine before the vagina and may be used for diagnostic purposes in the urocytogram.

Nonetheless, the urocytogram does present some disadvantages.

The threshold of response of the bladder trigone is higher than that of the vagina. The urocytogram is therefore less rich in cells, but, on the other hand, perhaps this allows a clearer reading. In addition, the urocytogram requires a longer laboratory preparation which however is highly compensated by the simplicity of specimen collection.

We have studied the degree of significance in results obtained from a parallel urocytologic and colpocytologic study in a group of women in order to evaluate which of the two procedures is most useful for hormonal cytodagnosis.

MATERIAL AND METHODS

Sixty-two women, ranging in age from 16 to 43 years (average age, 28.1) were studied.

All the patients, having regular menstrual cycles ranging in time from 27 to 30 days, underwent urocytologic and colpocytologic examination that was repeated 6 times in the course of one month, with a distance of 4 days between examination, for a total of 372 examinations.

The results of the estrogenic stimulus, expressed by the karyopyknotic index, obtained with both procedures were compared and analysed statistically.

For the urocytological examination, first morning urine, collected by spontaneous micturition, was preferred since it is richer in exfoliated cells. Within 3-4 hours of collection, the urine was centrifuged for 15-20 min. at 3000 rpm. The supernatant was discarded, and the sediment was smeared on 3 slides, using a small spatula.

The smears were fixed immediately in acetone for 15', stained according to Papanicolaou, mounted in Canadian balsam, and then read at the microscope. Colpocytological specimens were prepared and stained according to Papanicolaou.

RESULTS

The results of urocytologic (U) and colpocytologic (C) study are graphically reported in fig. 1, where no significant dif-

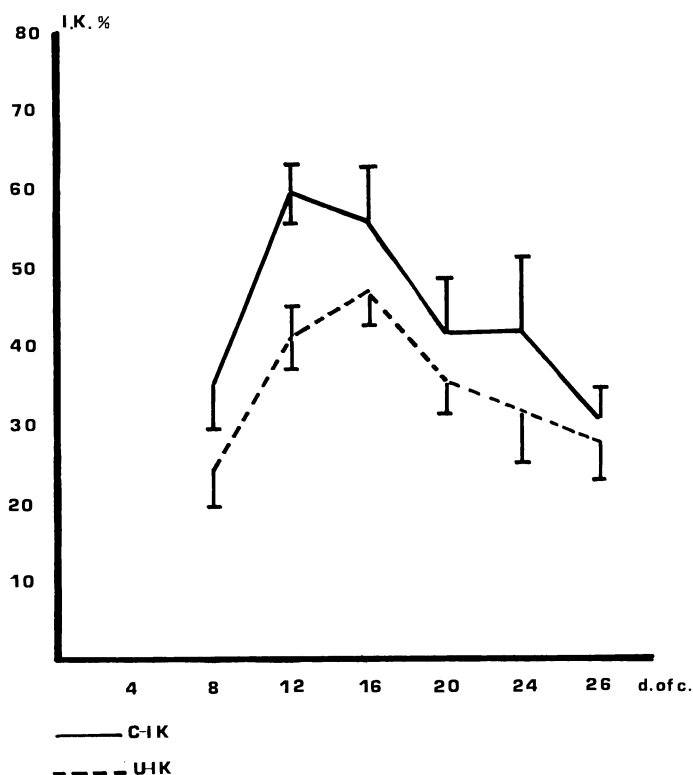


Fig. 1. — Values of the karyopyknotic index determined by colpocytology (C-IK) and urocytogram (U-IK) during menstrual cycle.

ferences in the curves of karyopyknotic index (IK) are observed regarding height, form and tendency.

Statistical analysis of the data demonstrated a significant correspondence ($p > 0.5$) between U results and C results except for the second examination (12th day of the cycle).

While the curves are practically parallel, the value levels are different. In fact, as seen in fig. 2, in 372 cyto-hormonal evaluations, the karyopyknotic index in U and C corresponds in 16.6%, in 71.1% the C-IK is higher, and only in 12.3% the U-IK is higher.

In the cases where C-IK is higher than U-IK, the difference is from 1 to 5 in

24%, from 6 to 10 in 22.2%, from 11 to 15 in 15.7%, from 16 to 20 in 7.4% and 21 to 25 in 1.8% of cases.

DISCUSSION

The comparative study of the validity of the urocytogram compared to colpocytology leads to the following considerations. An analysis of the data shows a significant correspondence between the results of both procedures regarding the karyopyknotic index.

During the menstrual cycle the IK curve in the urocytogram is parallel but lower than the vaginal IK curve, as also reported by other workers (^{7, 9, 13}).

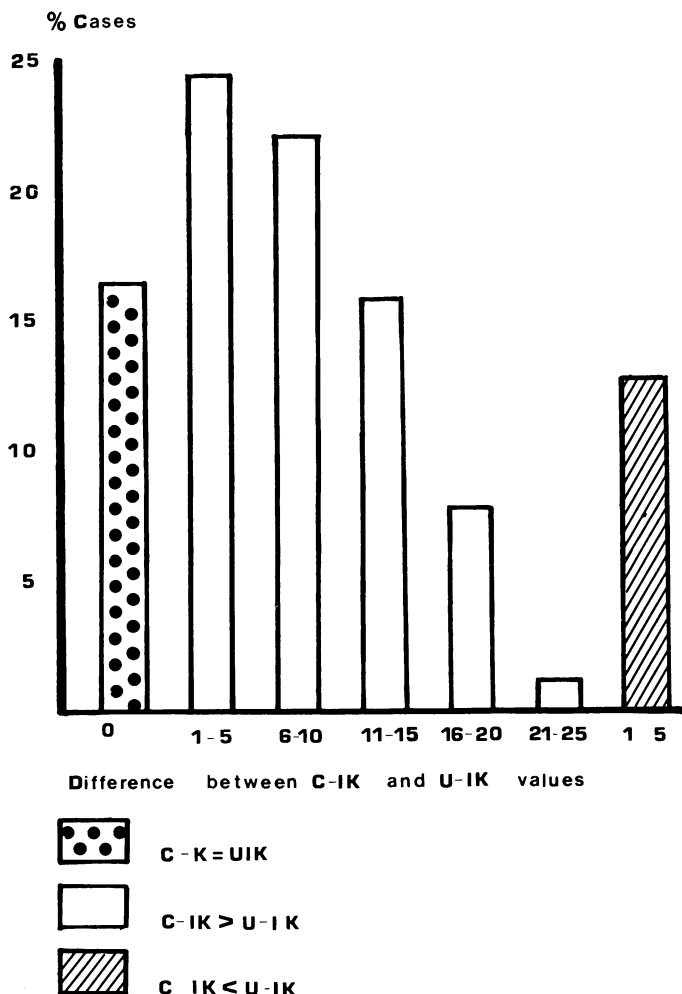


Fig. 2. — Difference between the values of karyopyknotic index, determined by colpocytology (C-IK) and urocytogram (U-IK) and their percentage.

The urocytogram was considered unsatisfactory for evaluation in a single case due to insufficient cellular material, while 10 colpocytological smears were unsatisfactory due to presence of monilia (2 cases), haemophilus vaginalis (1 case), mixed flora (2 cases), and excessive cytolysis due to *Bacillus vaginalis* (1 case).

The urocytogram therefore offers the additional great advantage of being almost immune to inflammatory-type conditions.

Moreover, the patients in this study preferred the urocytogram since its collection did not create any psychological distress, and required much less time.

The constant difference found between IK values in both methods due to the different response to estrogens in the bladder trigone and the vagina, despite their identical embryologic origin, did not contradict the validity of the urocytogram results.

Since the validity of urinary cytology for hormonal evaluation emerges clearly from this study, we therefore consider it a useful alternative to colpocytology where hormone evaluation is often negatively influenced by many local factors, particularly of the inflammatory type.

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