UROCYTOGRAM AND PREGNANCY—CORRELATION WITH VAGINAL CYTOLOGY

by

RAMESH CHOPRA,* M.B.,B.S.

and

KUSUM VERMA,** M.D.

Urocytogram is the study of hormonal status via urinary cytology (Del-Castillo, Argonz and Galli-Mainini, 1946). The epithelia of trigone of the urinary bladder and urethra, like that of the vagina, are under hormonal influence. Lencioni, Martinez-Amezaga and LoBianco (1969) and Lencioni *et al* (1973) obtained a good correlation between urinary and vaginal cytology in normal as well as high risk pregnancies. This technique has simplicity of specimen collection, is non-traumatic and can be carried out in the presence of vaginal infection. Inspite of all these advantages, it has not gained much popularity outside Latin America. The present study was undertaken to investigate the relationship between urocytogram and vaginal cytology in pregnant patients.

Material and Methods

Thirty-two pregnant women in third trimester were studied. In 19, pregnancy was normal while 13 suffered from complications like toxaemia of pregnancy (3), diabetes mellitus (3), heart disease (4) and bad obstetric history (3). All women delivered spontaneously at 38-42 weeks of gestation. Patients were instructed to collect the first voided urine in the morning in clean bottles. Smears from the lateral vaginal wall were also taken on the same day.

Smears were prepared from the urinary sediment according to the method of Lencioni, *et al* (1969). 20 ml. of urine was centrifuged for 5 minutes at 800 rpm. The supernatant fluid was removed and 20.0 ml of Ringer's solution (diluted in water 50:50) was added to the sediment. It was recentrifuged for 5 minutes at 800 rpm. The supernatant fluid was discarded and the sediment was spread onto 2 slides. One slide was immediately wet fixed in 95% ethyl alcohol and stained by modified Papanicolaou's technique (Gill 1969). The second slide was allowed to air dry and then stained by Hematoxylin Shorr's stain (Lencioni, *et al* 1969). Vaginal wall smears were wet fixed immediately in 95% ethyl alcohol and stained by modified Papanicolaou's technique (Gill 1969). In both vaginal and urinary smears 300 squamous cells were counted and results expressed as maturation index. Presence of cell clustering, mucus, bacilli and cytolysis was also noted on these smears.

Observations

In 14 (73.7%) of the 19 cases of nor-

*Resident in Pathology.

**Assistant Professor in Pathology.

Address all correspondence to Dr. Kusum Verma, Assistant Professor in Pathology, All India Institute of Medical Sciences, New Delhi 110 016.

Accepted for publication on 10-2-77.

mal pregnancy a close parallelism was observed between the urinary and vaginal smears (Figs. 1 and 2). The cell clustering was similar in both the specimens. The parabasal cells were more often seen in the urinary smears and upto 5% of these cells were considered non-significant. With this exception, the smears from the 2 sites were almost identical. In the remaining 5 (26.3%) patients, a variation in the percentage of the cells was noticed in the 2 smears. In 3 patients, higher number of parabasal cells (upto 8%) were seen in the urinary smears, while vaginal smears showed no parabasal cells. However, 2 patients, showed a higher number of superficial cells (15% and 12%) in vaginal smears while lower values (less than 10%) of these cells were found in the corresponding urinary smears.

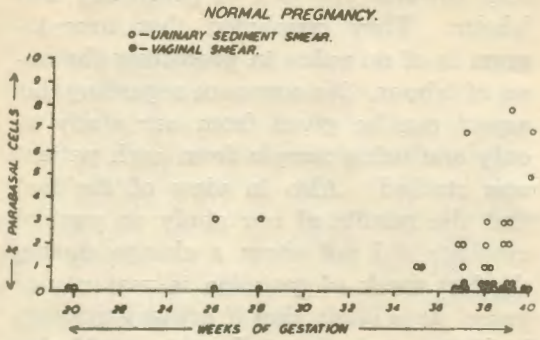

Fig. 1
Scattergram showing percentage of parabasal cells in urinary sediment smears and vaginal smears in cases of normal pregnancy.

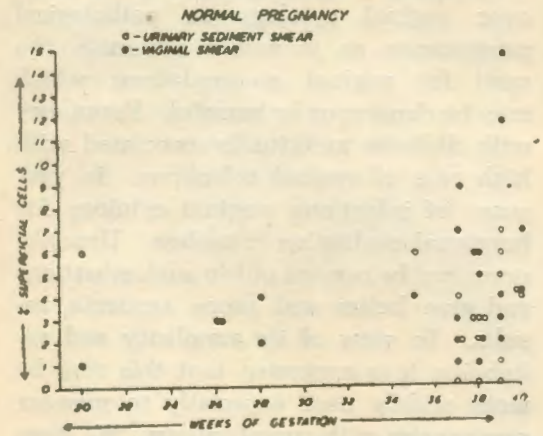

Fig. 2
Scattergram showing percentage of superficial cells in urinary sediment smears and vaginal smears in cases of normal pregnancy.

A similar correlation in urinary and vaginal smears was observed in patients suffering from complications of the third trimester of pregnancy (Figs. 3 and 4). In 12 (92.3%) patients, both the smears were almost identical with the exception of a few parabasal cells (upto 5%) seen in the urinary smears. In one patient (7.7%) suffering from toxaemia, a higher number of superficial cells (upto 13%) were observed in the urinary smears. The corresponding vaginal smear revealed only 1% superficial cells.

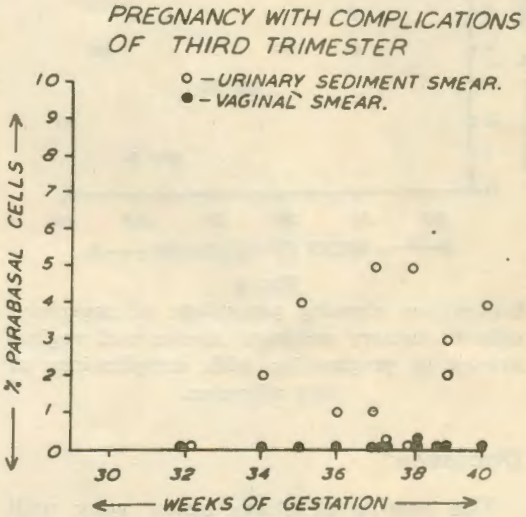

Fig. 3
Scattergram showing percentage of parabasal cells in urinary sediment smears and vaginal smears in pregnancies with complications of third trimester.

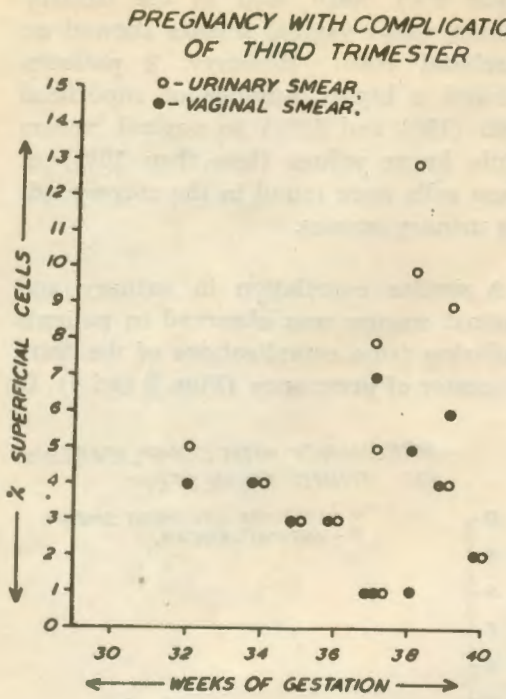

Fig. 4

Scattergram showing percentage of superficial cells in urinary sediment smears and vaginal smears in pregnancies with complications of third trimester.

Discussion

The results of study agree very well with those of earlier workers in latin America (Del-Castillo, *et al* 1949; Lencioni *et al*, 1965; Lencioni, *et al* 1969). We observed a striking similarity between the urinary and vaginal cytology in 73.7% of normal pregnancies and 92.3% of pregnancies with complications of the third trimester. However, larger numbers of parabasal cells (upto 5%) were observed in the urinary sediment smears as compared to vaginal smears. Lencioni, *et al* (1969) also found increased numbers of parabasal cells in urinary sediment smears. The upper limits for various cells determined by them were 5% superficial cells and 5% parabasal cells from 37 weeks to the end of gestation. They noticed no change in the percentage of cells towards the end of pregnancy and labour. They concluded that urocytogram is of no value in predicting the onset of labour. No comment regarding this aspect can be given from our study as only one urine sample from each patient was studied. Also in view of the fact that the results of our study on vaginal cytology did not show a change during the last week of gestation in majority of cases. It is likely that if urinary cytology had been studied serially, this would also not have shown any change. (Chopra *et al*).

Urocytogram has a definite advantage over vaginal cytology in pathological pregnancies as it would eliminate the need for vaginal manipulations which may be dangerous or harmful. Pregnancy with diabetes mellitus is associated with high rate of vaginal infections. In presence of infections, vaginal cytology for hormonal evaluation is useless. Urocytogram can be carried out in such situations and give better and more accurate results. In view of its simplicity and reliability, it is suggested that this may be more widely used especially to monitor pregnancies with complications. We have not studied urocytograms in abortions. But in view of the good results in non-pregnant conditions by other authors (Lencioni and Staffiery, 1954 and 1969) and late pregnancies by us and others (Lencioni *et al*, 1972), it may also prove to be reliable in cases of abortions also.

Summary

Urinary sediment smears were prepared in 32 pregnant women (19 cases of normal pregnancy and 13 cases of pregnancy with complications of third trimester). Hormonal evaluation on these smears and

simultaneously obtained vaginal smears were compared.

A higher number of parabasal cells (upto 5%) were seen in the urinary sediment smears as compared to vaginal smears. A limit of 5% parabasal cells was considered as within normal range. With this exception, a fairly good correlation was observed between urinary sediment smears and vaginal smears in 73.7% of normal pregnancies and 92.3% of pregnancies with complications of third trimester. Urocytogram can thus replace vaginal cytology. It would be of great importance in cases with vaginal infections and in cases of complications of pregnancy.

References

1. Chopra, R., Verma, K. & Buckshee, K.: submitted for publication.
2. Del Castillo, E. B., Argonz, J. and Galli Mainini, C. Semana Med. 53: 867, 1946.
3. Del Castillo, E. B., Argonz, J. and Galli Mainini, C. J. Clin. Endocrinol. 9: 1362, 1949.
4. Gill, G. W.: Exfoliative Cytology. Application Report. AR-24, Millipore Corporation, Bed Ford, Mass. 1969.
5. Lencioni, L. J., LoBianco, V. S., Amezaga, L. M. and Badano, H. Amer. J. Obst. Gynec. 91: 1112, 1965.
6. Lencioni, L. J., Martinez-Amezaga, L. A. and LoBianco, V. S.: Acta. Cytol. 13: 279, 1969.
7. Lencioni, L. J. Martinez-Amezaga, L. A. Alonosa, C., and DeCamargo, L.A.H. Acta. Cytol. 17: 125, 1973.
8. Lencioni, L. J. and Staffieri, J. J.: Endocrinol. (Kbh) 16: 270, 1954.
9. Lencioni, L. J. and Staffieri, J. J. Acta. Cytol. 13: 382, 1969.