MORPHOLOGIC LIPID PATTERNS IN EXFOLIATED VAGINAL CELLS IN CASES OF CARCINOMA CERVIX

By

SEEMA SHARMA, ASHA AGARWAL, SUSHEELA PRADHAN, VIMLESH K. SINGH, P. C. JAIN AND RASHMI SHARMA

SUMMARY

Present study was done to see lipid patterns in vaginal cells exfoliated from cancer cervix cases. The lipid patterns are influenced by oestrogen and progesterone. From this study lipid patterns in Premenopausal cancer cervix cases indicated oestrogen influence.

Introduction

Lipid inclusions of different size and of varying number and distribution are present practically in all cells (Baker 1957). Lipid distribution and synthesis are thought to be regulated by several hormonal factors. Evidence indicates that lipid distribution in cervical squamous cells is influenced by estrogen and progesterone (Masin and Masin, 1964, Maillet *et al*, 1978; Lahiri and Roy Chowdhury, 1981).

In normal menstrual cycle during the estrogenic phase the lipid granules are fine and uniformly distributed in vaginal exfoliated cells while during progesteronic phase lipid granules become larger and show confluence and clustering.

However the reports on morphology and distribution patterns of lipid in vaginal cells exfoliated from normal and cancerous cervices are largely discrepant (Faroker and Denham, 1957; Gross and Danziger, 1957, Wheeler and Danziger, 1955).

The present study was thus undertaken to study the lipid distribution patterns in vaginal cells exfoliated from cancers of cervix uteri. The lipid distribution patterns in vaginal cells exfoliated from premenopausal and postmenopausal normal and cancerous cervices were compared to see whether there is any change in the two types.

Material and Methods

For this study vaginal smears were obtained from 60 women. These women were studied in 3 groups.

Group I: 20 women of age group 20-40 years with regular menstrual cycle and apparantly no gynecologic problems were taken. The vaginal smears were taken on 18-20th day of menstrual cycle.

Group II: The normal postmenopausal series included 17 cases with cessation of menstruation. The cases were taken after 6 months—2 years of menopause.

From: Departments of Pathology and Obstet. and Gynaecology, G.S.V.M. Medical College, Kanpur.

Accepted for publication on 14-7-87.

Group I and II were taken as normal controls.

Group III: Comprises total of 23 cases of carcinoma of cervix uteri (clinical diagnosis of II and III stage). These cases were subgrouped as 13 premenopausal (Group IIIa) and 10 postmenopausal (Group IIIb) cases.

Smear collection and Staining

Material from the upper third of lateral vaginal wall was obtained with the help of wooden spatula and smeared on two glass slides. One was wet fixed in 95 per cent Ethyl alcohol and stained by modified Papanicolaou stain (Bancroft 1982). The second smear was wet fixed in Baker's fixative for 48 hrs and lipids were demonstrated by Sudan Black B stain as described by Pearse (1968). In the smears stained for lipid 100 cells were examined. The cells showing lipids were counted. The lipid granules were classified as small, medium or large using high power objective (X 280). The small granules were less than 1 μ, appeared as pin points, medium 2-3 times of the small granules and large 4-5 times of size of small granules (Fig.). The percentage of cells showing small, medium and large granules was calculated.

Results

The Table I shows the lipid distribution patterns in vaginal cells exfoliated from premenopausal and postmenopausal normal and cancer cervix cases. It is evident from the table that the mean percentage of total lipid positive cells (61.18%) in premenopausal cancer (Group III A) is quite high as compared to 47.63% of postmenopausal cancer cases (Group III B). Similarly the mean percentage of cells containing fine granules was much higher in premenopausal cancer (62.5%) than the postmenopausal cancer cases (41.1%). The Group III B cases showed more vaginal cells with medium and coarse lipid granules than Group III A cases.

When the two cancer groups were compared with their normal counterparts, a different pattern was observed.

TABLE I

Lipid Patterns in Vaginal Cells Exfoliated from Premenopausal and Postmenopausal Normal and Cancerous Cervices

		Normal		Cancer cervix	
		Premenopausal (Group I)	Postmenopausal (Group II)	Premenopausal (Group III A)	Postmenopausal (Group III B)
No. of cases		20	17	13	10
% of cells displaying lipids					
Total	mean	77.0	40.83	61.18	47.63
	range	68-83	32-54	54-69	38-61
Fine granules	mean	37.5	51.3	62.5	41.1
	range	26.2-44.1	49.3-62.3	53.5-70.7	31.2-56.7
Medium granules	mean	59	44.9	35.5	53.1
	range	51.5-71.3	30.2-59.3	25.9-41.2	44.8-69.0
Coarse granules	mean	3.5	3.8	2.9	5.8
	range	2.5-4.4	1.0-6.6	1.6-4.1	2.7-8.9

The normal premenopausal females (Group I) showed not only higher total lipid positive cells (77%), but also higher percentage of vaginal cells with medium and coarse granules (59% and 3.5% respectively) as compared to premenopausal cancer (Group III A) patients. No definite pattern was observed in the lipid pattern in normal postmenopausal cases.

Discussion

Differences of opinion exists regarding the distribution and fluctuation of lipid granules with regards to the hormonal cycle, as well as with neoplasia (Bibbo, 1969, Gross and Deniziger, 1957 and Foraker and Denham 1957). But it has been well confirmed by these studies that this distribution does show changes with change in hormonal status.

Here in the present study the distribution of lipid patterns showed some significant changes. A different behaviour was observed in the lipid pattern in exfoliated vaginal cell in premenopausal and postmenopausal cervical cancer patients. The premenopasual cases showed more percentage of total lipid positive cells (61.18%) as compared to postmenopausal group (47.63%), also percentage of lipid positive cells with fine granules was quite high (62.50) than their normal premenopasual (37.5) counterparts indicating a persistent high oestrogen activity. The postmenopausal cancer not only showed decrease in percentage of lipid positive cells but there were less number of cells showing fine granules. Majority of the lipid positive cells were showing medium and coarse granules.

Lahiri and Roy Chowdhury (1981) reported similar findings as of our study. While Gross and Danziger (1957) did not find significant difference in the intensity of lipid staining between cells from normal and carcinomatous cervices. Boschann (1957) found that dyskaryotic cells of vaginal epithelium show fine granules of neutral fat and acidic lipids. He further expressed that spindle shaped squamoid cells of carcinoma cervix were negative for Sudan Black B reaction.

It has been suggested that large lipid inclusions are mixture of neutral fats and phospholipids and Baker's fixative preserve the spherical configuration of lipid inclusions (Baker 1957). The relation between phospholipids and mitrochondria of the cytoplasm was recognised by Sinclair (1934). The basal cells of squamous epithelium are rich in mitochondria but as the cells move to higher strata, the mitochandria become scattered and diminish in number. Masin and Masin (1964) expressed the opinion that in maturing vaginal cells the concentration of proteins increases with the shift in the isoelectric point from the acid to the neutral side. The intermediate zone containing S-S groups (Herovici 1960) moves towards the epithelial surface, while the finely dispersed cytoplasmic lipid globules serve as a sign of an orderly proceeding maturation and differentiation. This may be the cause of moderate to marked staining reaction exhibited by cancer cells.

Long and Doko (1959) observed a strong reaction in both the stromal cells and some of the glandular elements in endometrial malignancy. Haven and Bloor in a review of lipids in cancer commented that malignant tumours have a high content of cholesterol. With these observations it appears that the sudanophilic lipid granules undergo aleration in morphologic patterns under the influence

of different sex hormones even in neoplasias.

The altered pattern of hormonal status as indicated by lipid pattern in the two groups of cases here poses the question that does this high level of oestrogen in premenopasual cancer cases have any role in the development of cervical cancer in early age because a low oestrogen activity has been indicated by lipid patterns in cases who developed carcinoma in postmenopausal age.

References

1. Baker, J. R.: Nature, 180: 947-949, 1957.
2. Bancroft and Stevens: Churchill and Livingstone, 2: 428, 1982.
3. Bibbo, M., Camargo, A. C. M. and Valeri, V.: Acta Cytol. 13: 260, 1969.
4. Boschann, H. W.: Acta Cytol. 1: 30, 1957.
5. Foraker, A. G., Denham, M. D.: Am. J. Obstet. Gynec. 74: 13, 1957.
6. Gross, J. S. and Danziger, S.: Am. J. Obstet. Gynec. 73: 93, 1957.
7. Haven, F. L. and Bloor, W. R.: Advances in cancer research, Vol. 4, New York, Academic Press, p. 283.
8. Herovici, C.: Acta. Cytol. 4: 56, 1960.
9. Lahiri, T. and Roychowdhury, J.: Acta. Cytol: 25: 572, 1981.
10. Long, M. E. and Doko, F.: Ann. N.Y. Acad. Sci. 75: 504, 1959.
11. Maillet, M., Chiarasini, D. J., Cava, E. Fournier, E.: Acta. Cytol. 22: 479, 1978.
12. Masin, F. and Masin, M.: Acta. Cytol. 8: 263, 1964.
13. Pears, A. G. E.: J & A Churchill, 1: 687, 1968.
14. Sinclair, R. G.: Physiol. Rev. 14: 351, 1934.
15. Wheeler, J. D. and Danziger, S.: Obstet. Gynec. 5: 739, 1955.

See Fig on Art Paper I