

SERUM FUCOSE AS AN INDEX TO COMPARE THE RATE OF PROLIFERATION OF MALIGNANT TISSUE IN SQUAMOUS CELL CARCINOMA OF CERVIX AND BREAST†

by

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Introduction

Shetlar (1949-50) and his co-workers observed that increase in serum glycoprotein levels in disease reflects as a whole or in part, processes associated with tissue proliferation. Hukamori and Jeanloz (1964) noted that malignant cells synthesizes more glycolipids containing fucose.

In addition to known physiological functions presence of high levels of glycoproteins in the blood of patients having malignancy, have stimulated a great interest in their study.

Barlow and Dilliard (1972) first of all estimated serum fucose in gynaecological cancer. After that considerable work has been done, but only a few workers have even tried to correlate the serum fucose in carcinoma cervix to carcinoma breast.

The present study has been aimed to evaluate the significance of serum fucose in determining the rate of proliferation of malignant tissue in cases of squamous cell carcinoma cervix and squamous cell carcinoma of the breast.

Material and Methods

Sixty patients each with cancer cervix and cancer breast and 60 normal females of same age group and same socio-economic status were studied on the indoor patients of P.B.M. group of Hospitals, Bikaner.

The technique adopted for fucose estimation was that given by Winzler (1958). All blood samples were withdrawn prior to excisional biopsy. Histopathological reports were then correlated with the level of serum fucose. Cancer cervix cases were assigned by the classification recommended by FIGO and cancer breast by Manchester's classification.

Observations

A total of 180 patients including normal control, patients with cancer breast and cervix were studied and level of serum fucose in different stages of both the type of cancers are tabulated in the Table.

†Paper read in III Rajasthan Obstetrics & Gynaecological Conference & Post Partum Seminar held on 12-14th September, 81 in S.P. Medical College, Bikaner.

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Accepted for publication on 30-9-81.

TABLE I
Levels of Serum Fucose in mg%

	Cancer patients				
	Total cancer patients (60)	Stage I (15)	Stage II (15)	Stage III (15)	Stage IV (15)
Normal Control (60):					
Mean \pm S.E.	5.70 \pm 0.38	—	—	—	—
Range	3.5 — 9.1	—	—	—	—
Cancer Cervix (60):					
Mean \pm S.E.	17.83 \pm 1.27	7.1 \pm 0.25	11.1 \pm 0.39	21.9 \pm 0.85	31.2 \pm 0.90
Range	3.6 — 37.8	5.6 — 9.0	8.6 — 13.6	15.4 — 30.2	25.6 — 37.8
'p' value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Cancer Breast (60):					
Mean \pm S.E.	16.06 \pm 0.37	14.2 \pm 0.94	16.0 \pm 0.61	16.25 \pm 0.66	17.8 \pm 0.72
Range	11.2 — 23.0	11.2 — 18.6	12.5 — 20.9	12.6 — 22.2	14.0 — 23.0
'p' value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

Results and Discussion

The mean serum fucose level in healthy females was 5.7 ± 0.38 mg%, having a range of 3.5 — 9.1 mg. Three different studies on serum fucose reported from India (Sharma and Sur, 1967; Arya and Bhatnagar, 1974; Deyasi *et al*, 1975) has observed the range of serum fucose between 4.6 — 8.6 mg in normal subjects, which is in agreement with our observations.

In the present study of 60 patients with carcinoma breast, the mean serum fucose level observed was 16.06 ± 0.37 mg% with a range of 11.2 — 23.0 mg%. A significant ($P = < 0.001$) rise in serum fucose level in cases of carcinoma breast was observed, in comparison to normal subjects (Table). A parallel increase in serum fucose was observed with the stage of carcinoma breast. Similar findings have been reported by Macbeth and Bekasi (1962); Rosato and Sheltzer (1971); Arya and Bhatnagar (1974) and Deyasi *et al* (1975).

Mean serum fucose level observed in present study in cases of carcinoma cervix was 17.83 ± 1.27 mg%, with a range of 5.5 — 37.8 mg. A significant rise ($P = < 0.001$) in serum fucose in these cases as compared to normal subjects was also observed. Barlow and Dilliard (1974) observed a range of 10.1 — 30.1 mg and Dutta *et al* (1976) a range of 12.2 — 32.3 mg, while Pradhan *et al* (1979) observed a mean value of 21.1 mg%.

On reviewing the observations it can be made clear that, there is a marked rise in serum fucose level in cases of carcinoma cervix in comparison to cases of carcinoma breast, in which there is a very slight increase in the serum level in different stages.

It can be concluded that either there is

much more proliferation of cells in cases of carcinoma cervix in comparison to carcinoma breast or the carcinomatous cells of cervix synthesizes more glycolipids containing fucose in comparison to carcinoma breast though both are squamous cell carcinomas. Confirmation of the observations of present study needs further study on histochemical analysis of fucose in squamous carcinomatous cells of both carcinoma cervix and breast.

Summary

1. Present study has been aimed to evaluate the significance of serum fucose in determining the rate of proliferation of malignant tissue in cases of squamous cell carcinoma of cervix and breast.

2. Total 180 patients were studied, 60 each of cancer cervix, cancer breast and 60 normal subjects of same age group and same socio-economic status.

3. Highly significant rise in serum fucose level was observed in both the types of carcinomas.

4. Rate of proliferation of cells in carcinoma cervix is much more in compari-

son to carcinoma breast or the rate of synthesis of glycolipid containing fucose is much more in cases of carcinoma cervix.

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