STATUS OF TRANSFERRIN RECEPTORS IN THE HUMAN OVARY IN HEALTH AND DISEASE

(A Preliminary Report)

by

A. SAHA
G. SINGH
and
K. BUCKSHEE

SUMMARY

The study was conducted to find out if transferrin receptors were present or absent in the human ovary in health and disease. Reactivity for transferrin receptors was present in ¾ (75%) ovarian malignancy, and ½ (50%) benign cystic teratoma of the ovary. But it was absent in all the three specimens of normal ovary (0%).

Introduction

Oncologists, world wide have been very enthusiastic about transferrin receptors, because of the possibility of harnessing it for diagnostic and therapeutic purposes in malignant conditions. Thus the present study was initiated to study the association of transferrin receptors in human ovary in health and disease.

Material and Methods

A total of 9 specimens were collected to study the reactivity of transferrin receptors, comprising of normal ovary (3), benign cystic teratoma of the ovary (2) and malignant ovarian tumour (4). These sections were then allowed to react with mouse antihuman transferrin receptor antibody, at a dilution of 1:100 at 37°C for 30 minutes followed by washing with NKH buffer and later treating with rabbit antimouse HRPO conjugate (Horse raddish peroxidase) at a dilution of 1:200. Excess of the conjugate was removed by repeated washing with NKH buffer. Subsequently the enzyme colour was developed by incubating with 3:3 diamine benzidine tetrahydrochloride (DAB, Sigma). These sections were then incubated in dark for 30-40 minutes at 37°C followed by washing with NKH buffer.

Following controls were run simultaneously:

1. Normal mouse antibodies; (2) buffer alone (Substrate control). Experiments were repeated when there was presence of non-specific staining in the controls or unsatisfactory immunostaining of the malignants cells. Histopathology

From: Departments of Obstetrics and Gynaecology and Biochemistry, All India Institute of Medical Sciences, Ansari Nagar, New Delhi-110 029.

Accepted for publication on 9-5-85.

of benign and malignant lesions was also undertaken.

Results and Discussion

Immunostaining for transferrin receptors was present in ¾ (75%) malignant ovarian tumour and ½ (50%) for the benign tumour of the ovary. However, Immunostaining for transferrin receptors was absent in all of 3 normal specimens of the ovary (0%)—Table I. It is difficult to explain why the sole non-malignant specimen (benign cystic teratoma of the ovary) gave a positive reaction for transferrin receptor. It is possible that the section was through the "FOCUS/"Mamilla" of teratoma which was the area of maximum growth, i.e. where the cells were rapidly dividing and growing, thus explaining the positivity. However, the other specimen of benign cystic teratoma was negative.

TABLE I
Transferrin Receptors

Histopathology	No.	No. Postive for Transferrin Recceptors
Normal Ovary	3	0
Benign Cystic Teratoma of the Ovary	2	1
Ovarian malignancies	4	3

It was further observed, that transferrin receptor could not be detected in a case of malignant teratoma of the ovary. But this specimen was labelled malignant because it consisted of immature neural tissue cells, though, it lacked the features of rapidly dividing cells. Thus, this could probably explain the absence of transferrin receptors. Faulk *et al* (1980) observed reactivity for transferrin receptors in only (2.7%) of non-malignant specimen of the breast, while 72.7% of breast carcinoma were reactive for transferrin receptors. The present and Faulk *et al* (1980) studies denote that transferrin receptors are widely prevalent in malignant conditions. Since these receptors are known to be present on mouse tumour cells, suitable animal models can be used to test the effectiveness of anti-receptor monocolonal antibody on *in vivo* growth of transplanted and spontaneous tumours and thus examine the potential deleterious effects of transferrin antibody on normal dividing cells. Oncologist could utilise transferrin receptors as a tumour marker in near future to detect metastatic deposits in gynaecological malignancies, recurrences of the tumour where the tumour load is so small that clinical examination and other available diagnostic tools do not suffice. Anti-transferrin receptors antibodies tagged with radioactive isotopes would also aid in immunodiagnosis and immunotherapy of malignant lesions in the near future.

Acknowledgement

We thank Professor G. P. Talwar for rendering valuable help and guidance in carrying out the above work.

Reference

1. Faulk, W. P., Hsi, B. L. and Stevens, P. J.: Lancet. **23**: 390, 1980.