

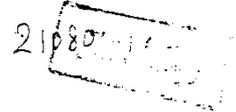
TUMOUR MARKERS  
IN  
PELVIC GYNECOLOGIC MALIGNANCIES



ESSAY

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# INTRODUCTION

INTRODUCCION

Cancer is exerting its terrible power arbitrarily. To conquer this most dangerous disease, research is underway in every country of the world to establish prophylactic measures by pursuing the cause of cancer on one hand, and to develop methods of early diagnosis and early treatment of cancer on the other. Among many diagnostic methods of cancer, one of somewhat different nature that uses a tumour marker, is attracting attention (Nobu Hattori, 1982).

Tumour markers will be defined as any substance present in a body fluid which reflects either qualitatively or quantitatively the presence of malignant disease (Torney et al., 1982).

Tumour markers include :

- 1- Oncofetal antigens (Alpha-fetoprotein AFP & Carcino-embryonic antigen CEA ).
- 2- Hormone production ( appropriate or inappropriate).
- 3- Acute phase proteins eg. Lactate dehydrogenase LDH.
- 4- Tumour-associated antigens.
- 5- Pregnancy-associated plasma proteins.
- 6- Others (Hudson, 1979)

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The principal uses of tumour biomarkers in several different clinical situations are : (Tormey et al.,1982)

- 1- Mass screening of normal populations.
- 2- Screening of selected populations at high risk for the development of cancer.
- 3- Prognostication in patients with either localised or advanced disease.
- 4- Detection of recurrent or residual disease following primary curative therapy.
- 5- Assessment of the response to systemic therapy in patients with metastatic disease.

Multiple biological factors may influence the level of a particular tumour biomarker in any body fluid. These factors include : (Tormey et al.,1982 )

- The kinetic of cancer cell proliferation and death.
- The rate of marker synthesis and secretion by cancer cells.
- The rate of marker catabolism and excretion by the host .
- The specific interaction between cancer cells and normal tissue.

HISTORY OF DIAGNOSTIC METHODS OF  
CANCER USING TUMOUR MARKERS  
=====

Over 100 years ago, Hilszfeld in Poland published a report claiming that there is something common between the sera of cancer patients and the fetus of pregnant women. This can be said to be a valuable publication predicting exactly the presence of what is called the carcino-fetal protein today. The fact that cancer tissue itself is morphologically undifferentiated constitutes the basis of diagnosis of cancer, and morphologists have long recognized that cancer cells are undifferentiated, young and weak, and resemble cells in the fetal stage. That cancer cells are undifferentiated may mean that they contain large quantity of undifferentiated substances in the fetal stage( Nobu Hattori,1982 ).

In the 1930's , Warburg in Germany demonstrated that cancerous and fetal tissues both have a high glycolytic capacity to decompose glucose into lactic and pyruvic acids and high activity of the enzyme system concerned with glycolysis, and that enzyme activity of the glycolytic system is increased in the serum of animals with cancer( Nobu Hattori,1982 ).

Oncofetal antigens  
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In 1963, Abelev of the U.S.S.R. discovered AFP which was actually playing a key role in the diagnosis of hepatocellular carcinoma. This oncofetal antigen is present normally in the fetal life, but disappears after birth. The endodermal sinus tumour of adolescence and young adult life commonly produce AFP(Abelev,1974).

In 1965, Gold and Freedman in Canada discovered CEA, and they were thought to suggest that CEA was produced only by colon cancer cells, but it has come to be found that it shows high levels in many other tumours. It is still probably the most useful nonspecific tumour indicator substance available and it has a definite role in follow-up and surveillance(Khoo and Mackay,1976).

Acute phase proteins  
-----

Attempts have been made to identify enzymes and other protein substances liberated by malignant tissues. Lactic dehydrogenase(Awais,1973) and other substances have been studied in ovarian cancer. Elevated levels of such substances are often found in patients with cancer( Hudson,1979 ).

Pregnancy associated plasma proteins

In tumours of germ cell origin containing trophoblastic elements the production of pregnancy-associated plasma proteins in relatively large quantities is highly specific and provides a sensitive tumour marker, however, they are appropriate only for the diagnosis and management of established disease in both sexes. Small amounts of these substances are produced from malignant disease in a variety of sites and have been detected histochemically in tumour tissue (Horne et al., 1976).

Tumour associated antigens

The demonstration of specific tumour antigens in human malignancy has been the object of investigation for many years. As early as the 1930's, antigens were thought to be specific for human neoplasms. More recently, reports of tumour-specific or tumour associated antigens have been published (Stanley et al., 1972).

Levi, Keller, and Mandle in 1969, described the antigenicity of serous cystadenocarcinoma carried in tissue culture, and Levi subsequently in 1971, described cervical carcinoma antigens.

Hormones

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Human chorionic gonadotropin (HCG) as originally  
and co-workers, 1972, has been  
used for patients with tropho-  
blastic disease. HCG levels have correlated  
with the extent of the disease and have proven  
valuable in assessing the response  
to chemotherapy (Donaldson et al., 1980).

Production of HCG by epithelial ovarian  
tumours (Mc Manus et al., 1976) has  
shown that the hormone may be a useful  
marker for gynecologic tumours.

Inappropriate hormone production is occasionally  
responsible for clinical endocrine syndromes in malign-  
ant disease. The best known example is Cushing's  
syndrome which most commonly occurs as a result of  
ectopic ACTH production by bronchial carcinoma. There  
is little evidence of this in gynecologic cancer (Nichols  
et al., 1962). The serum of a series of ovarian cancer  
patients has been screened for excess ACTH with only  
one marginally positive result (Rees, 1975).

Other examples of hormonal production by tissues

not normally found in the organ which is the site of the neoplasm is the production of thyroxine by a struma ovarii or the production of 5-hydroxytryptamine by a carcinoid tumour (Robboy et al., 1974).

### AIM OF THE WORK

The aim of this work is to review the different types of tumour markers in relation to pelvic gynecologic malignancies. Also, to evaluate their role in cancer prevention, detection and follow up .

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REVIEW  
OF  
LITERATURE

CARCINOEMBRYONIC ANTIGEN (CEA)