INTRODUCTION AND AIM OF WORK

INTRODUCTION AND AIM OF WORK

More than fifty percent of patients with breast cancer who undergo local surgical treatment will eventually die of metastatic disease, suggesting that the present physical methods of staging are inadequate, since presumably these patients had metestases at the time of operation. (Seidman, 1969).

Coombes and his colleagues, (1977b) suggested that it would be useful to have indices that could assist in staging patients with cancer of the breast more accurately before operation.

Biochemical markers have been shown to be useful in detecting micrometastases in several types of tumours, for example, chorionic gonadotrophic hormone in choriocarcinoma, (Bagshawe, 1969) and carcinoembryonic antigen in colorectal cancer, (Neville and Cooper, 1976). Breast cancer lacks such a specific tumour index substance. However many materials have been reported to circulate in the blood of patients with breast cancer in abnormally high concentrations, especially in those patients with metastases, (Coombes et al., 1977b).

Numerous hypotheses regarding the role of trace and bulk metals in relation to cancer have been reported and also the importance of metals as activators or inhibitors of many enzymes. Furst, (1963) discussed carcinogenesis by metals and chelating agents and suggested that metals can be carcinogenic if their local cellular concentration becomes high so that they can compete with the normal essential metals for the availble binding site in the lattice, and thus aid in the synthesis of abnormal polymeric nucleic acids. Thus cancers of different tissues should be in the main different, for each tissue concentrates different metals. A chemical carcinogen may act as a chelating agent, complex with an abnormal metal to form a chelate, which may penetrate the cell and may partially dissociate and liberate a source of abnormal metals for modifying enzyme activity or nucleic acid formation.

Berg and Burbank, (1972) reported positive correlations between trace metals in drinking water and cancer mortality in 28 cases; eight more than expected. The excess correlations came

mainly from cadmium (correlated with oral and pharyngeal cancer, esophageal cancer, breast cancer, intestinal cancer) and lead (correlated with intestinal cancer, kidney cancer, ovarian cancer, all leukemias). There were no significant positive correlations for chromium, cobalt and iron.

The role of trace elements in malignant disease evokes increasing interest with the advent of accurate methods of detecting their presence in human tissue. The observation that substantial differences exist in the concentration of such metals as potassium, zinc, copper, phosphorus and magnesium in malignant and normal tissue suggests that these elements may play a role in the etiology or metabolic alterations of cancer and excites interest in their possible use in diagnostic tests, (Schwartz et al., 1974).

In this study, the levels of ten minerals are estimated in the serum and urine of patients with fibroadenoma, fibroadenosis, or carcinoma of the breast and are compared with the levels in normal females. The concentrations of these metals are also measured in the normal and diseased breast tissue obtained from the above three groups of patients.

The included minerals in this study are sodium, potassium, calcium, magnesium and phosphorus representing the principal elements. Also iron, copper, zinc and manganese represent the essential trace elements, beside lead as one of the non essential trace elements.

The aim of this study is to compare the patterns of the metal levels in different groups and to detect any deviation from the normal patterns. This may act as an aid for the diagnosis, staging, and prognosis of benign and malignant breast tumours.