PART I ABSTRACTS OF MEMBERS' PROFFERED PAPERS

Wednesday, 4 April

IN VIVO UPTAKE OF LABELLED OESTRADIOL BY BENIGN AND MALIGNANT TUMOURS OF THE HUMAN BREAST.

N. J. O'HIGGINS, D. DESHPANDE and J. IAN BURN, Hammersmith Hospital and Imperial Cancer Research Fund, London.

We have investigated the uptake of labelled oestradiol by human mammary tumours after continuous infusion *in vivo*. After a preliminary loading dose, a continuous intravenous infusion of 64 μCi of tritium-labelled oestradiol in normal saline was delivered through a portable pump at a constant rate of 14 ml per hour. The infusion was continued for at least 3 hours before and during removal of the tumour. Radioactivity was measured in the tumour specimen and in the nuclear components.

Eight patients with benign lesions and 13 with cancer have been studied to date. The mean tumour count for patients with benign disease was 1228 disintegrations per minute (d/min) per g of wet tissue and for those with malignant disease 3195 d/min. Mean nuclear counts were 313 counts per minute (ct/min) per mg DNA for the benign group and 332 ct/min for patients with cancer. The difference in uptake between benign and malignant lesions was complete in the post-menopausal patients.

DETERMINATION OF *IN VITRO* HORMONE DEPENDENCE OF HUMAN BREAST CANCER.

H. FLAX and H. SALIH. Tumour Biology Group, Westminster Hospital.

We have developed a simple technique to study hand-cut slices of primary and metastatic breast cancers *in vitro*. They are maintained in short-term organ culture for 24 hours with various concentrations of 17-beta-oestradiol, testosterone and ovine prolactin. Results are compared histologically and histochemically, using the total dehydrogenase activity of the pentose shunt, with appropriate controls (Salih *et al.*, *Lancet*, 1972, *ii*, 1103).

A wide spectrum of hormone responsiveness has been found. A tumour is classified as " dependent " on a certain hormone only if it shows enhanced activity over both controls. Dependences of the first 120 patients studied were: prolactin alone-15, testosterone alone-13, oestradiol alone-12, prolactin and oestradiol-13, prolactin and testosterone-8. The remaining 59 were independent. The high incidence of prolactin dependence, alone or combined, has been the striking feature. Clinical correlation at this early stage is encouraging.

EFFECT OF HORMONES ON DNA SYNTHESIS IN EXPLANTS FROM RAT AND HUMAN BREAST CANCERS.

R. C. HALLOWES and D. J. LEWIS. Department of Pathology, Imperial Cancer Research Fund, Lincoln's Inn Fields, London.

Explants from chemically induced breast cancers in 26 rats and breast cancers from 30 patients were maintained in organ culture for 24 hours in hormone-containing media. The rate of DNA synthesis, measured by [^{3}H]thymidine incorporation, was determined during 0–4 hours and 20–24 hours.

The rat tumours could be divided into one group in which DNA synthesis was stimulated by insulin and in which the tumours regressed after either oophorectomy or ergocryptine administration, and another group in which DNA synthesis was not hormonally stimulated and in which the tumours did not regress.

Tumours from patients could be divided into one group in which DNA synthesis was hormonally stimulated and another group in which it was not. The proportion of L1 to L5 lactate dehydrogenase isoenzymes was found to be different in the two groups.