THE ENVIRONMENT AND CANCER OF THE OESOPHAGUS IN COUNTIES CORK AND KERRY
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A striking feature of the distribution of oesophageal cancer throughout the world is in the proximity of areas of high incidence and mortality, to areas where the disease is insignificant (Day, N. E. Some aspects of the epidemiology of Oesophageal Cancer. Cancer Res. 35, 3304, 1975). This is particularly well known in the Transkei in South Africa, an area less than 150 by 100 miles, where a marked variation in incidence occurs from district to district, increasing from the North-east to South-west and apparently influenced by environmental factors such as soil type and farming methods (Rose, E. F., McGlashan, N. D. The spatial distribution of Oesophageal carcinoma in the Transkei, South Africa. Br. J. Cancer, 31, 1975).

The relationship of the physical environment to this disease is considered in a detailed spatial study of 450 deaths which occurred between January 1971 and December 1981 in people domiciled in Counties Cork and Kerry. The Unit areas are urban districts, rural districts and city wards; the index is the Standardised Mortality Ratio (SMR) which is scaled so that the ratio for the region is 100. Unit areas with SMR's less than 100 have age-standardised death rates lower than the regional over-all figure and vice versa.

A map based on the SMR's of the unit areas illustrates the low and high mortality places using appropriate colour shading.

Statistically significant low mortality for squamous cell carcinoma of the oesophagus was found for Kerry with a trend of increasing mortality eastwards to significantly high mortality in South-east of County Cork. The cases from the low and high mortality districts were compared for age, marital status and occupation with no difference evident between them.

The mortality map is then compared with the physical features of the environment such as soil type, and land use capability. A significant association is suggested between environmental factors and mortality from squamous cell carcinoma of the Oesophagus in South-west Ireland.

HYPERCALCITONINAEMIA IN NON SMALL CARCINOMA OF THE LUNG. AN ECTOPIC HORMONE?
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The presence of elevated plasma calcitonin immunoreactivity (iCT) is well recognised in patients with bronchogenic carcinoma. It occurs most commonly in patients with small cell carcinoma of the lung and ectopic production of the hormone by small cell carcinoma is described. This has not been described in other cell types and there is continued debate as to whether the excess calcitonin is thyroidal or pulmonary in origin.

We have carried out a preliminary study to investigate hypercalcitoninaemia in patients undergoing surgery for non small cell carcinoma of the lung. Sixteen patients had plasma iCT measured by radioimmunoassay on blood samples, taken following an overnight fast, on the morning of operation and ten days postoperatively. Radioimmunoassay for iCT was performed on tumour tissue frozen at −140°C in liquid nitrogen. Immunocytochemistry was performed on tumour tissue fixed in 4% paraformaldehyde.

The normal range for plasma iCT was 0-140 ng/L. Five patients (DC, EC, CK, TL and MM) had elevated plasma iCT preoperatively (285, 285, 145, 265 and 340 ng/L respectively). Following surgery the plasma iCT levels of all five patients had fallen to within the normal range. In four of these patients the diagnosis was squamous carcinoma. In the fifth patient the mass removed was composed of fibrous tissue with no evidence of malignancy. Of the remaining eleven patients, eight had squamous carcinoma, two had adenocarcinoma and one had a fibrous mass with no evidence of malignancy.

Radioimmunoassay of ‘tumour’ extracts from fifteen patients revealed significant levels of iCT in two cases (DC and CK). The levels present were 360.5 and 42.0 ng/gm wet tissue respectively. Both had elevated plasma iCT. Immunocytochemistry using two antisera to calcitonin at dilutions of 1/50 to 1/200 was negative in all sixteen ‘tumours’.

We feel that these early results suggest that elevated plasma iCT is a feature of non small carcinoma of the lung, but is not definitely due to ectopic secretion by the tumour. In view of the patient without malignancy (MM) demonstrating the same pattern of a postoperative fall in plasma iCT from an elevated level, we think that the elevation may be due to excess calcitonin being produced by the lung in response to the presence of a ‘tumour’.

ALTERED IMMUNE PARAMETERS IN PATIENTS WITH GASTROINTESTINAL MALIGNANCY
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Twenty-four patients presenting for surgery with gastrointestinal malignancies were assessed im-
LARGE GRANULAR CELLS IN BONE MARROW CULTURE POST ALLOGENEIC BONE MARROW TRANSPLANTATION (ABMT)

Maura Reynolds and S. R. McCann. St. James's Hospital and Trinity College, Dublin

Natural killer (NK) cells may play a role in bone marrow allograft rejection. We have studied 8 patients at intervals post ABMT. Conditioning for 4 patients (3 AML, 1 ALL) was busulfan (16 mgs/kg daily for 4 days) and cyclophosphamide (50 mgs/kg for 4 days) and for 3 ALL and 1 CGL was TBI (1,000 rads, single fraction, 4.5 rads./min. linear acceleration) and cytotoxics (VCR., VM26, daunorubcin, ARA C, steroids). Engraftment occurred in all cases and was confirmed by karyotypic analysis and/or RBS genotyping. Marrow was cultured at weekly intervals post transplantation. 2 x 10^6 cells were cultured in semi-solid short term culture. All cultures were set up in the presence of foetal calf serum and autologous serum and incubated in 5% CO2/95% air at 37°C. Growth curves appear to be a good reproducible method of demonstrating their survival following a dose dependent rate of growth after irradiation, but that the final density of cells in the flask is also dose dependent.

Growth curves appear to be a good reproducible method of demonstrating the cell-killing effect of radiation on skin fibroblasts. Clearly it will be necessary to do further work such as kinetic studies using autoradiography in order to investigate further the extent to which cell numbers reflect the cytotoxic effect of radiation.

EFFECTS OF HUMAN α2 INTERFERON TREATMENT ON VIRUS YIELD AND TUMOUR ANTIGEN EXPRESSION IN A TRANSFORMED SV40 RESISTANT MONKEY CELL

Helen Shine and J. K. Collins, Virology Unit, Microbiology Department, University College, Cork.

The CV-1 clone of African green monkey kidney cells is one of the most permissive in terms of SV40 tumour virus replication. We have isolated mutants of these cells which restrict SV40 replication. We are using these cellular mutants to study at a molecular level cellular functions which are utilised/modified by the virus for both replication and tumourigenicity.

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