166 POSTER

NATIONAL COMPARATIVE AUDIT IN CLINICAL ONCOLOGY: THE ROYAL COLLEGE OF RADIOLOGISTS' COIN PROJECT

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The Faculty of Clinical Oncology of the Royal College of Radiologists together with the Joint Council for Clinical Oncology has a strong commitment to clinical audit and has established a major programme to clinical audit and has established a major programme of work, the Clinical Oncology Information Network (COIN) project to address variations in medical practice. COIN is funded by the Clinical Audit Unit of NHS Executive to: develop evidence-based guidelines of best practice; get national agreement on clinical core data sets for oncology; and to develop computer work-stations specifically designed to facilitate data capture. This is a collaborative effort between cancer specialists, all of whom have been invited to contribute by nominating themselves or others to be active collaborators (Specialty Working Groups) within particular areas of interest or specific cancer sites. It is intended that the COIN deliverables will be adopted by the NHS as clinical standards, making national comparative audit of clinical oncology possible. COIN is also a member of consortia which have submitted proposals to the European Commission's Framework IV programme, Telematics for Healthcare, to work on systematic reviews and guidelines and their telematic dissemination, and on the development of clinical workstations for oncology.

167a POSTER

THE CANCER EPIDEMIOLOGY IN REGION SUBJECTED TO MULTIPLE RADIATION INFLUENCE

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We try to clear up the causes of abnormal oncomorbidity in the Altai region, the population of which is about 2.8 million people. It has been proved that the region was subjected to the influence of radiation after nuclear testing at Semipalatinsk between 1949–1965. The oncomorbidity has increased three times within the last 35 years (mean increase is about 8.5% per year). The analysis revealed a waved character of oncomorbidity increasing, having reached its maximum over two six-year periods (1961–1966 and 1982–1988). These peaks appeared in 12–26 years after nuclear testings in 1949 and 1962 that were accompanied by the most powerful radiation influence on the Altai region. In 1969–1991 the rate of oncomorbidity increasing was 1.5 times higher than the average data obtained in Russia, being respectively in men 84.6% and 51.2%; in women 29.2% and 20.7%. The highest increase of oncomorbidity was revealed in two age-groups: before 29 years and in subjects older than 70 years. Among all cancer subjects children made up 1.2% that is one-third higher than that of the average data in Russia. Lung cancer ranks first in Russia, i.e. one-fifth of all cancer incidences (in m. one-third). Small cell lung cancer makes up 27%. Thus, the Altai region is important for a very high degree of oncomorbidity, which seems to be the result of a long effect of ionized radiation.

167b POSTER

APOPTOSIS, INTRINSIC RADIOSENSITIVITY AND PREDICTION OF RADIOTHERAPY RESPONSE IN CERVICAL CARCINOMA

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Apoptosis has been thought a feature of radioresponsive malignancy. Sixty-six patients with cervical cancer & previously measured intrinsic radiosensitivity following 2 Gy of radiation (SF2 value) had measurement of the percentage of apoptotic cells (Apoptotic Index or AI). AI was recorded in ten H and E stained tumour sections with Mitotic Index (MI) and K1–67 positivity as measures of proliferation. High AI was associated with poor prognosis. Five-year survival & local control for tumours with an AI below the median was greater than for those with an AI above the median (79% versus 47% for survival, $P = 0.003$; 79% versus 61% for local control, $P = 0.01$). AI & SF2 were independent, but AI correlated with MI & K1–67. Patients with both an SF2 & AI value above the median did badly (25% 5-year survival, 46% local control) compared with those with values below the median (80% 5-year

survival, 100% local control), AI may reflect proliferation and could be used with SF2 as a predictor of tumour response to radiotherapy.

168 POSTER

IMPACT OF SECOND MALIGNANT TUMORS (SMT) ON SURVIVAL AFTER HODGKIN'S DISEASE (HD), EARLY (T1–2) LARYNGEAL CANCER (ELC), BREAST AND CERVIX CANCER (BC, CC)

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Many patients (pts) treated for MD, ELC, BC and CC are cured of their diseases. They are therefore exposed to the risk of developing a SMT. These four groups of pts, however, are quite different as far as their features are concerned. We considered of interest to compare the incidence of SMT in the different clinico-pathological and therapeutic subsets of the four series, along with the effects of SMT on survival.

We studied 1121 HD pts consecutively treated 1960 through 1988 at the Florence Radiotherapy Department (743 Clinical Stage I–II, 378 with CS III and IV; 745 treated with radiotherapy -RT- alone, 104 with chemotherapy alone -CT- and 272 with RT + CT). Cause specific survival at 20 years is 63%. Among these pts 74 SMT have been observed, for a cumulative incidence at 20 years of 18%. Cumulative survival after the diagnosis of SMT was 26% at 7 years, for the solid tumors, 9% at 3 years, for the leukemias. The second group consists of 424 ELC pts consecutively treated 1970 through 1992 in Florence (308 glottic; 111 supraglottic; 5 subglottic; all treated with radiotherapy). Cause specific survival at 10 years is 82%. Among these pts, 36 SMT have been observed, for a cumulative incidence at 10 years of 17%. Cumulative survival after the diagnosis of a SMT was 23% at 5 years. We studied also survival data and incidence of SMT in pts treated at our institution for BC and CC, whose clinical and therapeutic features are largely different from those of the two groups already described. Some general statements will be drawn.

169 POSTER

CT-PLANNING OF BOOST IRRADIATION IN DEFINITIVE TREATMENT OF BREAST CANCER

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In 45 of 173 women who underwent breast conserving surgery and irradiation including a boost to the tumorbed, an additional CT planning of the boost was performed.

Treatment volume—setup and electron beam energy initially were determined by clinical examination, pre- and postsurgical mammograms and schedules. CT-planning was performed using continuous slices throughout the whole breast. Tumorbed showed a good visibility by scaric residuals or marked by radiapaque clips. In the CT slices a target volume was defined, containing tumorbed with a margin. Computer assisted treatment planning was performed.

Comparing the clinical assessed treatment plan to the isodose plots of the CT-planning radiation technique had to be changed in part in 38 women and completely in 5 cases.

CT planning of the mamma boost gives the opportunity of an optimal dose delivery to the tumorbed with regard to the individual anatomy.

170 POSTER

POTENTIAL TIME SAVINGS USING COMPUTER ASSISTED SEGMENTATION OF PELVIC CT IMAGES

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The aim of this study was to evaluate possible savings in the time spent segmenting pelvic CT data for 3 D conformal prostate radiotherapy planning. Three male subjects with early carcinoma of the prostate underwent an extended CT scan of the pelvis. Contiguous 5 mm. axial scans (mean 76 images per subject) were acquired from L3 to mid thigh. These images were segmented manually into prostate, bladder, rectum, femoral heads, external contours and pelvic bones. The task was repeated using computer segmentation algorithms developed within the COVIRA project of the EU. These include region detectors, edge detectors, algorithms with both functions and others capable of refining approximate outlines. The planner had prior expert knowledge of these and the most appropriate one for a given tissue. Times reported are the average of 3 segmentations for each of the 3 subjects and include editing: