Screening for ovarian cancer—progressively elevating serum CA 125 concentrations

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An elevated serum CA 125 level in association with an abnormal pelvic ultrasound scan is a highly specific screening test for epithelial ovarian cancer in post-menopausal women (Jacobs *et al.*, *Lancet*, 1988); but its acceptability may be limited by its sensitivity. It is postulated that this may be improved by looking at changes in serum CA 125 levels over time. Screened women found to have a raised serum CA 125 level, but a normal scan, were monitored with three monthly serum CA 125 assays for a year. During this year, three women were diagnosed as having ovarian cancer. In each case there had been a progressive elevation in the serum CA 125 concentration with increases of 50% or more per three month interval. In conclusion, serum CA 125 concentrations may be elevated prior to recognised, ultrasound changes in ovarian morphology, and progressive increases, with rapid elevation in the serum CA 125 level, may be indicative of ovarian cancer. Such women should be subject to increased surveillance.

Human antibodies and host recognition of epithelial ovarian cancer antigens

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The lack or apparent lack of epithelial ovarian carcinoma specific antigen(s) has hampered the research in the subject. This may well be due to the use of mouse antibodies recognising antigens relevant to the mouse. Human antibodies derived from committed lymphocytes using Epstein–Barr virus (EBV) transformation offer the opportunity of studying antigens relevant to the human host. Human antibodies (IgG1) derived from lymph node lymphocytes have been produced. These lymph nodes were recovered from patients with histologically proven malignant ovarian cancer and the B-cells were immortalised using this technique. Glycoproteins from epithelial ovarian cancer cells, normal and malignant gynaecological, and colorectal carcinoma tissue were studied using a membrane preparation system and compared by gel electrophoresis, western blotting and immuno-staining using a second antibody technique. A glycoprotein of molecular weight 26 kD, and PI 6.8 was detected more frequently in mucinous carcinomas and was absent from other gynaecological and GI malignant tissues.

Early clinical results with a ^{99m}Tc labelled anti-CEA F(ab)$_2$ obtained with a new enzymatic method

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A new enzymatic method, using ficin as a proteolytic agent, has been standardised for murine monoclonal IgG1 digestion. High-yield F(ab')$_2$, suitable for clinical use, were obtained with a rapid and reproducible procedure not affecting the affinity and the immunoreactivity of the antibody. Carcinoembryonic antigen (CEA)-specific monoclonal antibody bivalent fragments (F023C5) have been directly labelled with ^{99m}Tc after a reduction step. A 90–95% labelling yield was obtained in a 15 min reaction by choosing optimum reagent characteristics and concentrations. A series of over 20 patients with CEA-producing tumours have been submitted to immunoscintigraphy by planar and SPECT method, confirming SPECT imaging to be advantageous. We conclude that ^{99m}Tc-labelled F(ab')$_2$ produced by ficin digestion are suitable for tumour radioimmunodetection.

Analysis of handguided probes show limited discrimination characteristics from intrasurgical radioimmunodetection

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This study was undertaken to test handguided gamma detecting probes for intrasurgical radioimmunodetection. For standardised conditions a phantom and tumour analogues were used to describe the lowest detection limit. The phantom model imitated the radioactive background. The handguided probes were examined for detection of the tumour analogues in front of and inside the phantom. Commercially available detectors for ^{131}I turned out to be useless because the lowest detection limit was 20 times too high and because they were not protected from background radiation. A handguided probe for ^{99m}Tc was close to the detection limit necessary for patients. We conclude that commerically available handguided probes are of questionable value for radioimmunological detection of cancer.

Intravesical administration of AUA1 radiolabelled monoclonal antibody in bladder carcinoma

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AUA1 monoclonal antibody was radiolabelled with ^{111}In and administered intravesically to 19 patients undergoing cystoscopy for superficial bladder carcinoma. The antibody remained in the bladder for one hour. Tumour and non-tumour samples were obtained during cystoscopy and counted in a gamma counter. Immunostaining with AUA1 and autoradiography were also performed on paraffin embedded and frozen sections. The uptake at 2 h, 24 h and 48 h (expressed as % of injected dose/g tissue $\times 10^{-3}$) were: tumour: 5.94 ± 5.6 ($n = 6$), 1.62 ± 2.4 ($n = 7$), 0.27 ± 0.14 ($n = 3$) and normal: 0.3 ± 0.3 ($n = 9$), 0.21 ± 0.21 ($n = 8$) and 0 ($n = 3$). AUA1-DTPA-^{111}In was stable *in vivo* and immunoreactive. There was no radioactivity in the blood at 1, 2, 3 and 4 days after the administration. Intravesical administration of radiolabelled monoclonal antibodies may represent a new, non-toxic and potentially therapeutic approach for superficial bladder carcinoma.

Enhancement of monoclonal antibody uptake by tumours in patients with non-small cell lung cancer following palliative irradiation

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The effect of radiation on antibody localisation was evaluated in patients with non-small cell lung cancer (NSCLC). Ten patients were studied before and immediately after the completion of palliative external beam radiotherapy. Irradiation was delivered using 6–8 MeV photons from a linear accelerator. Tumour dose in each patient was 2250 cGy or 3000 cGy in 5 or 10 fractions respectively. Each patient received 300 μg of ^{111}In-HMFG1 F(ab')$_2$ fragments (1mCi). External body scintigraphy was performed and computer analysis of the scans using ROI was carried out. Observable antibody localisation in the tumour was found in 9 out of 10 patients studied. The mean values of the tumour to normal lung ratio were higher after radiotherapy ($P < 0.05$) compared to pretreatment values. The mean enhancement of antibody localisation was $15 \pm 2.2\%$. Blood clearance of the administered antibody before and following radiotherapy was not significantly different. None of the patients developed antimurine antibodies. In conclusion, external body irradiation can influence favourably antibody localisation to tumours.