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IOR C5: A NOVEL MONOCLONAL ANTIBODY IN COLORECTAL CANCER RADIOIMMUNODIAGNOSTIC.

Colorectal cancer is the third cause of death among malignant neoplasms in Cuba. Different labeled monoclonal antibodies (Mab) have been used for the diagnosis and follow-up of this tumors by immunoscintigraphy. Recently, a new Mab ior c5 has been developed at Center of Mollecular Immunology, Havana, Cuba. It recognizes a new tumor-associated antigen: IOR C2, found in most of colorectal adenocarcinomas. **Aim of the present study** was to assess the diagnostic utility of this antibody, labeled with 99mTc, as well as to study its pharmacokinetics, biodistribution and internal dosimetry. **Methods**. Sixty patients suspected of having colorectal cancer were studied in a phase I/II clinical trial. Three milligrams of 99mTc-ior c5 was administrated to the first 10 patients and 1 mg to the rest of them. 1, 2, 4 and 24 hours anterior, posterior and SPECT image was performed, and in biodistribution study whole body was done. HAMA responses were measured. **Summary of the results and discussion**. Plasmatic clearance was fixed to a biexponential curve with $T_{1/2\alpha}$ = 5 h and $T_{1/2\beta}$ = 38 h. Just 4.8±0.5 % of the injected dose eliminated via urine. Liver, heart, lung, kidneys, spleen and urinary bladder received higher dose. No HAMA response was found in evaluated patients. Sensitivity and specificity of the immunoscintigraphy with 99mTc-ior c5 was 100% using as gold star a biopsy test. New metastases or recurrent lesions were detected in 56 % of the cases. No adverse reaction was observed. **Conclusion** This monoclonal antibody is useful for the diagnosis and follow-up of colorectal cancer, its metastasis and releases.

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ANTI-MELANOMA IMMUNOSCINTIGRAPHY WITH MONOCLONAL ANTIBODY 225.28S IN PATIENTS WITH SUSPECTED OCULAR MELANOMA

The aim of this study was to determine the usefulness of anti-melanoma immunoscintigraphy (ISG) with monoclonal antibody 225.28S in patients with suspected ocular melanoma. We analyzed the results of 32 consecutive (ISG) in the same number of patients (17 M, 15 F), with mean age of 56.4 yrs, presenting with a clinical or radiological (CT, US, MR) diagnosis of ocular melanoma. The ISG was considered positive when a focal increase in the uptake of the radiopharmaceutical was observed, either on planar, tomographic views, or both. Seventeen of the 32 pts. (53.1%) had a suspected choroid plexus melanoma, 8 (25%) had a suspected ciliary body melanoma, and 2 (6.3%) had a suspected melanoma of the iris. The precise anatomical location was unknown to us in 5 pts (15.6%). Twenty-two pts. performed the ISG before any form of therapy (surgery or radiotherapy); the remaining ten were evaluated post-therapy. Among these 22 pts, 7 (30.4%) were later submitted to surgery, 5 (21.7%) were submitted to radiotherapy, 5 (21.7%) were lost to follow-up, 3 (13.04%) are undergoing further evaluation, one (4.3%) was diagnosed with a benign disorder, and one pt. (4.3%) has thus far refused surgery. The dimensions of the lesions were unknown to the Nuclear Medicine department in 13 of these 22 pts. The remaining 9 pts. had lesions ranging in size from 9.6 to 21 mm. The smallest lesion detected by ISG had a greater diameter of 12 mm, whereas a 20 mm lesion was missed.
Among the pts. studied pre-surgery, we have been able to review the histological diagnosis in 7 pts., which together with the results of the ISG resulted in 3 true positives, one false positive, and 3 false negatives (42.9%, 14.2% and 42.9%, respectively). The one case considered a false positive had both US and CT lesions indicative of choroidal melanoma. The ISG revealed a faint and dubious uptake in the same location. The pathological exam revealed a hemorrhagic area and a hemossiderin deposit measuring 8 mm. When we considered the group of pts (n=22) who underwent ISG pre-therapy, excluding those lost to follow-up and those still undergoing diagnostic procedures, the results were similar: 7 (50.0%) false negatives, 5 (35.7%) true positives, 1 (7.1%) true negative, and 1 (7.1%) false positive. In summary, in this group of pts., the sensibility of the ISG was 41.6%, the specificity 50.0%, the positive predictive value 83.3% and the negative predictive value 11.1%.

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A COMPARISION OF RECONSTRUCTION ALGORITHMS WITH FDG PET. ITERATIVE RECONSTRUCTION SEGMENTED ATTENUATION CORRECTION (IRSAC) ALLOWS GREATER DETECTABILITY THAN FILTERED BACK PROJECTION (FBP).

AIMS: To compare standard FBP reconstruction with an iterative reconstruction algorithm in patients using CT or Pathology as a gold standard. METHODS: A group of 24 patients with primary aerodigestive tract tumours studied on a GE Advance camera prior to adjuvant chemoradiotherapy had their images reconstructed with both the standard FBP method and a new IRSAC algorithm. The emission scans were performed for 6 minutes per field of view. Transmission data was acquired for 4 minutes per axial field with 68-Ge rod source in all cases. The FBP reconstruction parameters were 128x128 matrix with a Hanning filter cutoff 8.6, 15 mm smooth. The IRSAC parameters were 28 subsets, 2 iterations, with a loop filter of 4.3 mm, a Z axis filter and a post filter of 6mm. A blinded consensus reading was made with 3 experienced PET physicians. The IRSAC images read earlier than the FBP with the reading sessions separated by about 8 weeks. Lesions seen were graded on a 5-point confidence scale (0-4). Lesions were considered true positive if there was confirmatory evidence of disease on either the pretreatment CT scan or the post treatment pathology. As there was no sampling of normal tissues, no statement can be made as to the rates of false positives. RESULTS: There were a total of 69 lesions identified. All 24 primaries were seen with complete concordance. Twenty-one other lesions were seen in 11 patients in a concordant fashion. Thirteen unconfirmed lesions in 10 patients were seen with IRSAC that were not seen with FBP. There were five unconfirmed lesions in five patients seen with FBP that were not seen with IRSAC. There were six lesions in five out of the 24 patients (20.8%) that were proven on CT or pathology seen only with IRSAC. The mean confidence level of reading on a lesion by lesion basis was 3.3/4 with FBP and 3.4/4 with IRSAC. The difference of the means of the ease of readings was 1.08 and was statistically different at the level of $p<0.0001$. Overall image quality on a per patient basis was judged as 2.5/4 with FBP and 3.5/4 with IRSAC. CONCLUSION: IRSAC is more sensitive in the detection of disease, and produces more "pleasing" images than FBP.

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INFLUENCE OF THE POSITRON RANGE IN PET IMAGING: COMPARISON OF BROMINE-76 AND FLUORINE-18.

We address the influence of positron range, structure size and ROI size on the quantitation of radioactive concentration using Positron Emission Tomography (PET), in similar imaging conditions as those used for the clinical routine at our institution. Two phantoms were scanned on an ECAT EXACT HR+ (HR+) and an ECAT 953B/31 (ECAT) PET systems: a 3D Hoffman phantom to visually assess the image quality and a resolution phantom with six spheres of different diameters to measure the quantitation loss. The Hoffman phantom was filled with a solution of bromine-76 (^{76}Br) and a solution of fluorine-18 (^{18}F). The spheres of the resolution phantom were filled with either ^{76}Br or ^{18}F solutions while the cylinder surrounding the spheres was filled with ^{11}C. Dynamic scans were performed on each scanner following the decay of the radioisotopes leading to various contrast conditions. Data were reconstructed using the same parameters as those used in clinical protocols. The quantitative loss was assessed using the contrast recovery coefficient (CRC) and the spill-over coefficient (SOC). Time activity curves measured in ROIs placed on each sphere, M(t), were fitted using the following function $M(t) = CRC\ A(t) + SOC\ B(t)$, where A(t) and B(t) represent the true radioactivity concentrations present at time t in the spheres and in the cylinder respectively. The visual analysis of the images obtained using an Hoffman 3D phantom showed that image resolution and image contrast between different regions were radioisotope dependent and clearly better when using ^{18}F. Linear profiles taken on these images confirmed the visual assessment. For a given scanner and a given ROI, the CRC values obtained with ^{18}F were systematically higher than those measured using ^{76}Br, specially for the smallest spheres. For a given radioisotope and tomograph, the CRC values decreased with the size of the structures. The CRC values also decreased when the size of the ROI increased. The use of a tomograph with a better spatial resolution greatly increased the CRC values for ^{18}F while the improvement of these values was mild when using ^{76}Br. These differences may be due to the differences in the positron ranges of the radioisotopes used in this study. The measurements performed in this study showed that the comparison of studies obtained on a same camera depends on the radioisotope used and may need the adaptation of ROI size between exams.