P25 CHANGE IN BLOOD VOLUME FOLLOWING CORRECTION OF ANEMIA WITH RECOMBINANT HUMAN ERYTHROPOIETIN IN PATIENTS ON MAINTENANCE HEMODIALYSIS

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The aim of this study is was to evaluate the effect of recombinant human erythropoietin (rHuEPO) therapy on blood volume in 19 patients (12 male, 7 female, mean age 39 ± 11 years) with severe renal anemia (hematocrit <0.25), and having regular hemodialysis (mean duration 5.0 ± 3.4). Blood volume was measured using method adjusted in our laboratory as by-product during routine equilibrium radionuclide ventriculography with 740 Mbq Tc-99m-human serum albumin twice: 1) before rHuEPO treatment and 2) at the time when target hemoglobin (Hb) reached 100 g/l. Time elapsed to reach target Hb was 3.4 ± 1.4 months; Hb increased from 73 ± 6 to 111 ± 11 g/l,($p<0.0001$). Red-cells volume was significantly increased from 16 ± 3 prior therapy to 26 ± 6 ml/kg($p<0.001$) after therapy. Despite significant decrease in plasma volume (53 ± 10 before vs. 48 ± 11 ml/kg after, $p<0.01$) total blood volume was increased from 69 ± 12 to 73 ± 16 ml/kg($p<0.01$) after correction of anemia. Significant fall in cardiac index was found after treatment due to reduction of left ventricle end-diastolic volume($p<0.01$) and heart rate($p<0.05$), while ejection fraction and blood pressure remained unchanged during rHuEPO treatment. We concluded that increase in red-cell volume occurs within short time period through correction of anemia, along with decrease in plasma volume, but increase in total blood volume.

F1 A UNIFORM PROTOCOL FOR SCINTIGRAPHY OF THE MYOCARDIUM WITH 201-Tl IN AUSTRIA

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19851 heart studies were performed in Austria in 1993. Because of different developments, traditions, education and training in Nuclear Medicine multiple protocols for 201-Tl scintigraphy of the myocardium exist in the 41 departments of Nuclear Medicine in Austria.

Therefore results of 201-Tl scintigraphy of the myocardium may vary considerably in sensitivity, specificity and clinical findings. Referring physicians not familiar with this technique are confused, and heart studies are often repeated unnecessarily. A uniform protocol for scintigraphy of the myocardium with 201-Tl after exercise or pharmacological stress-testing would enable to compare the results obtained. Furthermore, it would avoid repetition of heart imaging and save time of examination and at least costs.

To overcome these problems a workshop was organized by the Austrian Society of Nuclear Medicine November 26th, 1993 in Vienna. The aim was to establish a uniform protocol for 201-Tl heart studies after exercise and pharmacological stress-testing. A consent was reached and therefore this uniform protocol will be used from the beginning of 1995.

This protocol describes indications for 201-Tl scintigraphy of the myocardium, the methods of stress-testing, acquisition and processing of the studies and quality control of the cameras.

F2 CARDIOVASCULAR NUCLEAR MEDICINE: STATE OF THE ART

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Evaluation of myocardial function: first pass studies can be obtained at time of almost every investigation. Assessment of myocardial function is improved using short living isotopes and repeated stress studies as well as gated tomographic imaging and technetium perfusion agents. Nonimaging probes have limited value in continuos monitoring of cardiac function. Stress-echo (transoesophageal) is competitive to nuclear techniques in assessment of contractility.

Myocardial perfusion imaging using knowledge from PET and available tomographic or planar imaging modalities gives unique possibilities to detect viable myocardium. Thallium remains the tracer for myocardial viability evaluation on convenient systems when new imaging protocols are applied. New technetium labeled radiopharmaceuticals allow better imaging possibilities for SPECT techniques. Several pharmacological agents are available in addition to traditional physical stress for assessing hemodynamic importance of coronary artery stenoses for diagnosis and in treatment evaluation.

Imaging myocardial necrosis is marginal in confirmation of majority of acute myocardial infarctions. It is used to assess area at risk after thrombolytic therapy for evolving myocardial infarction using dual-isotope techniques (perfusion agent with infarct-avid tracer in dual isotope technique). Antimyosin antibodies are useful also for confirmation of subacute or remote infarction, myocarditis or rejection after cardiac transplantation.

Metabolic and receptor imaging are promising in evaluation of cardiomyopathies and myocardial viability not only on positron emission tomography but also on avaliable imaging systems.

In conclusion, new techniques and new radiopharmaceuticals for cardiovascular imaging allow more accurate answers to clinical problems. As the possibilities for research and clinical PET are limited, further transfer of PET-results to convenient imaging modalities is promising.

F3 PHYSIOLOGIC BASICS AND CLINICAL EXPERIENCE WITH SOMATOSTATIN-RECEPTOR-SCINTIGRAPHY

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The introduction of radiolabelled octreotide, an analogon to the receptor binding hormone Somatostatin, has markedly increased the ability to detect structures and tumours carrying somatostatin receptors by nuclear medicine imaging with high sensitivity and specifity. It has been shown that in vitro receptor density and in vivo scintigraphic results correlate well in particular in tumours of neuroendocrine origin of the GI tract such as insulinomas, gastrinomas, glucagonomas, carcionoids, but also in paragangliomas, small cell lung cancer and meningeomas. As receptors were also shown to be present on so called activated leucocytes granulomas, lymphomas and autoimmune disease have been imaged with octreotide successfully.

The specific tracer (In-111-DTPA-D-PHE-Octreotide, Octreoscan^R) is rapidly cleared from the blood pool by the kidneys and, partially, via the liver providing a high target to background ratio. Physiologic uptake is usually observed in the pituitary and thyroid glands, in spleen and liver. Optimum tracer accumulation for tumour scintigraphy is seen on the 24-h-images with the best target to background ratios. Additional SPECT-imaging is recommended in particular in the abdominal regions.

The sensitivity in imaging the above named tumours ranges from 70 up to 100%. In-111 octreotide imaging is of diagnostic impact both for the primary diagnostic evaluation as well as for detecting or excluding secondary manifestations in known tumour sites. Of specific value is the information on relative receptor density in the tumour to be treated as may be obtained by quantitative In-111 octreotide imaging for decision making whether or not to use cold octreotide (Sandostatin^R) as a receptor blocking drug for therapy as well as for treatment follow-up studies.