information which corresponds to a metabolic reaction, possibly in relation with some aspect of the disease, and may contribute to better define the status of the patient.

The PET/CT centre in Hôpital Tenon, Paris is part of the EuroNet-PHL-C1 study which has a different aim than our project. We have the possibility to use a significant amount of multimodality data has been gathered over 3 years. At the first step, we included 19 patients examined between October 2009 and December 2011. The age range was 6–17 years. All patients had Hodgkin lymphoma. We evaluated the baseline and interim FDG PET/CT (iPET) after 2 cycles of chemotherapy searching for the next five "non-specific" signs: diffuse uptake of the bone marrow, of the thymus, of the spleen, of the spinal cord and activation of the brown fat. We made visual and semiquantitative analysis (with SUVmax) of "non-specific" uptakes. Based on clinical data, we were looking for correlation between any of the studied criteria, the clinical particulars of the patient (e.g. infection, inflammation, stress), the final response to therapy and possible side effects.

Based on the visual interpretation of the "non-specific" uptakes we had the following results: diffuse thymus hyperactivity was detected in 16% (3/19) at baseline and in only 5% (1/19) on the iPET; diffuse bone marrow hyperactivity was detected in 37% (7/19) at baseline and in 16% (3/19) on the iPET; diffuse spleen hyperactivity was detected in 48% (9/19) at baseline and in 5% (1/19) on the iPET; diffuse spinal cord hyperactivity was detected in 31% (6/19) at baseline and in 16% (3/19) on the iPET; 5% (1/19) of the patients had brown adipose tissue uptake on the baseline and the iPET as well. The semiquantitative analysis showed that there is a significantly decreased uptake on the iPET in the case of diffuse spleen uptake and a significant increase of diffuse liver uptake which was measured as reference value. Regarding the relation between "non-specific" uptake and clinical follow-up data of the patient, we are still gathering prospective data, these results are not yet available. We have just provisional preliminary conclusions. Our results showed that in paediatric Hodgkin lymphoma the diffuse spleen hyperactivation at baseline was more frequent than in adults, elevated diffuse thymus uptake was not frequent on the iPET and the liver uptake was elevated after 2 cycles of treatment.

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EARLY EXPERIENCE WITH 18F-DOPA PET/CT IMAGING IN CHILDREN

M.L. Udvardy[1], Ü. Méder[2], P. Hauser[3], M. Garami[3], M. Szabó[2], Á. Jermendy[2], A. Körner[2], P. Molnár[1], Sz. Szakáll[1], K. Kajáry[1], Zs. Lengyel[1]

[1]Pozitron Diagnostic Centre, Budapest, Hungary
[2]Semmelweis University 1st Department of Paediatrics, Hungary
[3]Semmelweis University 2nd Department of Paediatrics, Hungary

Background: Presently in Hungary more than ninety five percent of PET scans are performed using 18F-fluorodeoxyglucose (FDG) as the radiotracer. A wide range of cancer types are detectable with FDG, nevertheless in some malignancies the utility of FDG is limited. However, for some of these cases other agents are available, for example 18F-DOPA for the evaluation of neurendocrine tumours. Neuroendocrine tissues have several common biochemical characteristics; they are all have the capacity to take up and decarboxylate amine precursors. These cells convert 18F-DOPA to 18F-dopamine by L-aminoacid-decarboxylase and store the latter in their vesicles. Thus neuroendocrine tumours are detectable by 18F-DOPA proportional to their decarboxylase content. Our objective is to present our experience with the practical issues and evaluation of paediatric 18F-DOPA scans.

Material and methods: We have performed five PET/CT scans using 18F-DOPA radiotracer in children. The indications were restaging of neuroblastoma in four cases and the exploration of the diffuse or focal nature of the cause of congenital hyperinsulinaemia in one case. The injected 18F-DOPA activity was determined based on the EANM recommendation, the tracer (IASOdopa) was from IASON GmbH (Graz-Seiersberg, Austria). Additionally to the late (40–60 mins p.i.) early static acquisitions (5 mins p.i.) were also performed, if abdominal location of the tumour was suspected. Emission data was acquired for three minutes at each bed position using a Siemens Truepoint 6 HD instrument; images were reconstructed by iterative algorithm.

Results and conclusions: Based on the small number of cases it is not possible to evaluate the usefulness of 18F-DOPA scans in children. However, we would like to discuss some important technical details and evaluation issues of paediatric 18F-DOPA scans.

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INVESTIGATION OF SMALL ANIMAL TUMOR MODELS IN VIVO USING MINIPET-SCANNER

T. Nagy[1], Gy. Trencsényi[1], J. Szabó[1], M. Emri[1], É. Balogh[1], P. Kertai[2], T. Marian[1]

[1]Department of Nuclear Medicine, Debrecen, Hungary
[2]Department of Preventive Medicine and Public Health, University of Debrecen, Medical and Health Science Centre, Debrecen, Hungary

Background: Small animal PET technique is one of the most sensitive in vivo method for detection of tumors and for the monitoring of cancer therapy in preclinical studies. Earlier examinations showed, that carbohydrate and amino acid metabolism in cancer cells are more dynamic than in normal cells. The 18FDG (for the detection of glucose metabolism) and 11C-methionine (for the detection of amino acid transport and metabolism) are useful PET radiotracers for the detection of primary tumors and metastases. Aims: In our research, the growing of primary tumors was monitored in rodent models with two PET tumor diagnostic tracers using MiniPET-II scanner.

Material and methods: Myelomonocytic leukemia tumors (My1/De) were induced in Long-Evans rats by subcutan injection and surgery (implantation under the kidney capsule). The changes of the intensity of tumor metabolism was followed by 18FDG and 11C-methionine using small animal PET scanner (University of Debrecen, Department of Nuclear Medicine). The recordings were evaluated with BrainCAD software. The 18FDG and 11C-methionine uptake were expressed in terms of standardised uptake values (SUVs) and tumor to muscle (T/M) ratios.

Results: The subcutaneously injected and the surgically implanted myelomonocytic sarcoma tumors showed an intensive growing, which was manifested in the intensity of glucose and amino acid metabolism also. Five days after tumor cell implantation the primary tumor were clearly detected by MiniPET-II scanner using the two tumor-diagnostic tracers. The tracer accumulation and tumor growth was monitored for 15 days. The increased accumulation of radiotracers clearly demonstrated the malignancy of tumors. During the test period necrotic areas were not detectable in the experimental tumors.

Conclusion: Our results showed that 18FDG and 11C-methionine are useful tumor-diagnostic tracers for monitoring the growing of implanted tumors and the changes in metabolic processes in animal models. The MiniPET-II scanner is a helpful appliance in the experimental cancer research. With the help of this scanner, we can examine the physiological and pathological processes in the living body using PET-labeled molecules.