Material and methods: We have performed five PET/CT scans using 18F-DOPA radiotracers 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 hyperinsulinemia in one case. The injected 18F-DOPA activity was determined based on the EANM recommendation, the tracer (IASONdopa) 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. Nagy², Gy. Trencsényi¹, J. Szabó², M. Emri¹, É. Balogh¹, P. Kertai², T. Marian¹
¹Department of Nuclear Medicine, Debrecen, Hungary
²Department 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 (MyI/De) were induced in Long-Evans rats by subcutaneous 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.