Nuclear Medicine and its promising applications in gynecological cancers

Nuclear medicine is defined as: "the scientific and clinical discipline in which free radionuclides and radionuclide compounds, redistributed in vivo or in vitro by physical or chemical mechanisms, are used for diagnostic, therapeutic or investigative purposes" [1]. It seems that the above definition of Nuclear Medicine well includes the fact that Nuclear Medicine embraces into very important areas such as molecular imaging, cellular imaging and tissue imaging.

Related to the interesting papers of Çerçi S. S. et al in HJNM [2, 3], we may additionally state the following: During the last decade much research has drawn attention to the role of nuclear medicine as a promising modality in gynecology. ^{18}F-FDG PET/CT highlighted its useful role in gynecological imaging, especially, for the investigation of gynecological cancers. In high grade endometrial cancer, ^{18}F-FDG PET/CT accurately detected distant metastases in the abdomen and extra-abdominal regions and the above findings influenced patients' management [4]. ^{18}F-FDG PET/CT also performed better than conventional imaging (pelvis US, CT, MRI) in detecting recurrence in post-therapy patients with endometrial carcinoma [5]. In regard to primary ovarian cancer, PET/CT was found to be superior to pelvis US, abdomino-pelvic CT and pelvic MRI for the diagnosis of malignant ovarian tumors and valuable for identifying metastatic ovarian cancer [6, 7].

Çerçi S. S. et al in an original research [2] studied the relation between SUVmax, Hif-1a (hypoxia inducible factor), adrenomedullin angiogenetic factor and Bcl-2 (antiapoptotic factor) in cases with endometrial cancer. The pathfinder results showed that SUVmax, is not associated with Hif-1a, adrenomedullin or Bcl-2 as expected and also that increased uptake of ^{18}F-FDG in endometrial cancer seemed to be independent of Hif-1a and its downstream factors. In the near future we will be able to study hypoxia also in other types of human tumors and perhaps perform a better evaluation of cancer metabolism [2]. It is interesting that pelvic MRI imaging and whole-body PET/CT play complementary roles in imaging evaluation of gynecological cancer. MRI diagnoses and defines tumor extent in central pelvic soft tissues while PET/CT diagnoses lymphadenopathy and extra-pelvic metastases. Fused PET/CT may also detect placental site trophoblastic tumors [3]. PET/MRI has also an important role in the detection and treatment follow-up of gynecological cancer [7]. More research on this field by Nuclear Medicine is warranted.

The authors declare that they have no conflicts of interest

Bibliography

1. Howard J. Definition of Nuclear Medicine. *J Nucl Med* 1968; 9: 465.
2. Çerçi S. S, Yalçn Y, Bozkurt K. K et al. Hypoxia-inducible factor-1α, adrenomedullin and Bcl-2 although expected are not related to increased uptake of fluorine-18-fluorodeoxyglucose in endometrial cancer. *Hell J Nucl Med* 2015; 18: 228-32.
3. Çerçi S. S, Erdemoglu E, Bozkurt K. K et al. Placental-site trophoblastic tumor and fluorine-18-fluorodeoxyglucose positron emission tomography/compputed tomography. *Hell J Nucl Med* 2015; 18: 264-7.
4. Picchio Maria, Mangili Giorgia, Samanes G et al. High-grade endometrial cancer: value of [^{18}F]FDG PET/CT in preoperative staging. *Nucl Med Commun* 2015; 31(6): 506-12.
5. Punit S, Rakesh K, Harmandeep S et al. Carcinoma Endometrium: Role of ^{18}F-FDG PET/CT for Detection of Suspected Recurrence. *Clin Nucl Med* 2012; 37: 649-55.
6. Eun Ji N, MI Jin Y, Young Taik O et al. Diagnosis and staging of primary ovarian cancer: Correlation between PET/CT, Doppler U/S and CT or MRI. *Gynecologic Oncology* 2010; 116: 389-94.
7. Lee S, Catalano O and Dehdashti F. Evaluation of Gynecologic Cancer with MRI, ^{18}F-FDG PET-CT, and PET/MRI. *J Nucl Med* 2015; 56: 436-43.

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Errattum: In the paper of «^{18}F-FDG PET/CT findings in a case of a semantic variant of primary progressive aphasia», published in HJNM 2015; 18(2): 163-5, the name of Erdal Guzeldemir should be Erdal Eroglu