A New Technique: Quantitative Global Disease Assessment of FDG-PET/CT

Yeni Bir Teknik: FDG-PET/CT ile Quantitative Global Hastalık Degerlendirme

Global Hastalik Degerlendirme / Global Disease Assessment

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To the editor:

Molecular imaging has great potential for clinical application and for advanced scientific research. Fluorodeoxyglucose positron emission tomography/computed tomography (FDG-PET/CT) is currently among the most commonly used imaging modalities for this aim. Accumulation of FDG in many malignant cells makes FDG an excellent and sensitive marker for detecting changes in glucose metabolism in cancer cell [1]. FDG PET imaging is a functional imaging technique, which is able to measure in vivo distribution and quantification of this radiotracer and is routinely performed for staging, restaging, treatment planning and follow-up of a variety of human cancers in the clinic [2, 3]. Hybrid imaging modalities that combine computed tomography (CT) or magnetic resonance (MR) imaging with PET imaging improve the diagnostic accuracy of PET images [4].

The methodologies used in clinical settings for PET data interpretation are categorized into three groups: (a) qualitative or visual scoring; (b) regional quantitative analysis, which is currently used in daily practice of PET, ie. SUVmax , SUVpeak etc. and (c) Global disease assessment which reflects the total disease burden in the body [5].

The concept of global metabolic activity measurement was first introduced by Alavi and coworkers in the early 1990s for assessment of the whole brain metabolism in patients with AD and in age-matched controls [2, 6]. This technique allows assessment of global disease burden that is especially useful for evaluation of metabolic response in cancer. Over the past two decades, quantitative PET imaging became the most optimal noninvasive approach for assessing regional and global metabolic state in clinical oncology [5]. This approach has been effectively employed in clinical practice in lung cancer [6], malignant mesothelioma [4], lymphoma [7], and benign disease such as atherosclerosis [8] and Crohn's disease [9] pioneered by Alavi and colleagues [10].

Quantitative global assessment provides useful information about disease activity in malignant or benign disorders as a prognostic biomarker and monitoring response to treatment. We believe that, in the future, global quantitative approach will allow meeting the challenges faced in daily practice of medicine.

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