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PET/CT in management of oncologic patients

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This issue of the journal contains review articles concerning the role of positron emission tomography (PET) in the management of oncologic patients.

Marino et al. [1] describe a weak fluorodeoxyglucose (FDG) uptake in ductal carcinoma in situ and in invasive lobular carcinoma of the breast, while infiltrating ductal carcinoma has the highest FDG uptake among breast neoplasms. Furthermore, they point to significantly higher FDG uptake in tumors with unfavorable prognostic characteristics.

Vassilakopoulos et al. [2] summarize PET/computed tomography (CT) as the "gold standard" for response assessment in lymphoma patients and consider it mandatory for baseline staging, obviating the need of bone marrow biopsy. Total lesion glycolysis, which has a possible prognostic impact, has also been discussed.

Roelcke [3] reports on the use of PET with radiolabeled amino acids in patients with glioma. In low- and high-grade gliomas, amino acid PET allows response assessment during chemotherapy, and in high-grade gliomas, it enables the differentiation of treatment-related changes from tumor progression during cytotoxic therapy.

Tufman et al. [4] conclude that additional metabolic information during or following treatment for non-small-cell lung carcinoma (NSCLC) is increasingly valuable in clinical decision making. They argue that following surgical treatment, PET is more effective than CT alone in identifying recurrence.

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In summary, FDG-PET imaging is increasingly being employed for diagnosis, determining the extent of disease, and assessing response to therapeutic interventions. As such, whole-body PET imaging has been accepted by the medical community as the study of choice in patients with a variety of disorders, including those with cancer. However, issues related to optimal quantification at baseline and following treatment are still evolving, and there is some controversy and, to an extent, crisis in ideal utilization of this powerful modality in various stages of the disease, including cancer. Conventional approaches including measurement of standardized uptake value by assigning regions of interest to a limited number of lesions in cancer are associated with significant errors and do not allow optimal assessment of disease activity at baseline and following treatment. Therefore, there is a dire need to standardize these approaches in a way that adequately addresses the serious issues that have been cited in the literature. We strongly believe that partial volume correction is a must for accurate quantification of lesions that are almost of any size and at any location in the body [5]. Furthermore, we believe global disease assessment for each lesion, and measurement of disease burden throughout the whole body must be performed routinely to generate a single value that can be easily communicated to clinicians at baseline and following treatment [6]. The software for the latter purpose is available through industry vendors and is being modified to meet the needs of the community on a routine basis. Furthermore, the use of novel quantitative techniques such as dynamic imaging (dual and multiple time-point imaging) further defines tumor biology and will play a major role for improving the sensitivity for detecting tumors and determining its degree of aggressiveness in the future [7]. FDG will remain the agent of choice for years to come because of its important role in many biological disorders, including cancer, inflammation, and clot detection. Although other tracers are being

employed for specific purposes (such as amino acids for brain tumors and others), FDG remains the ideal agent for the foreseeable future. We believe that reports of either negative or minimally active lesions based on FDG-PET are misinterpretations of the true nature of such findings [8]. Tumors with negative or low levels of activity are mostly due to highly differentiated and likely benign lesions.

Conflict of interest
None.

References

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