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CORRESPONDENCE

Both Interim and End-of-Treatment ^{18}F-Fluoro-2-Deoxy-D-Glucose Positron Emission Tomography Scans Have Low Value in Diffuse Large B-Cell Lymphoma

TO THE EDITOR: The article by Mamot et al[1] described their study, which included 138 patients with diffuse large B-cell lymphoma (DLBCL) who were treated with six cycles of rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP). Patients underwent ^{18}F-fluoro-2-deoxy-D-glucose positron emission tomography (FDG-PET) scanning at baseline, after two cycles of R-CHOP, and at the end of treatment. FDG-PET scans were evaluated centrally according to the Deauville criteria, with scores of one to three considered negative and scores of four or five considered positive, in line with the current guidelines.[2] Patients with a positive FDG-PET scan after two cycles of R-CHOP had a significantly shorter 2-year event-free survival (EFS; 41%) than did patients with a negative FDG-PET scan (76%), whereas there was no significant difference in overall survival between patients with positive (84%) and negative (94%) interim FDG-PET scans. At the end of treatment, 25 patients had a positive and 95 patients had a negative FDG-PET scan, according to the Deauville criteria. Patients with a positive end-of-treatment FDG-PET scan had a significantly worse EFS (24%) compared with patients with a negative end-of-treatment FDG-PET scan (72%). Mamot et al[1] concluded that interim FDG-PET has limited prognostic value in DLBCL patients who are homogeneously treated with six cycles of R-CHOP. However, in contrast to the interim FDG-PET assessment, they reported end-of treatment FDG-PET/computed tomography scanning to have high prognostic value, a statement with which we disagree.

According to the Deauville criteria, only 25 patients were positive at and 95 were negative at the end of treatment FDG-PET scanning. Although patients with a positive FDG-PET/computed tomography scan at the end of treatment had a poor outcome (EFS, 24%), the prognosis of patients with a negative FDG-PET scan was not good either (EFS, 72%), which demonstrates that a considerable proportion of end-of-treatment FDG-PET–negative patients eventually develops disease relapse during follow-up. Indeed, considering the fact that the group of FDG-PET–negative patients at the end of treatment was much larger than the FDG-PET–positive group, it has to be concluded that the majority of patients in whom R-CHOP eventually seemed to have failed had a complete remission status according to end-of-treatment FDG-PET.

The unsatisfactorily low predictive value of end-of-treatment FDG-PET has been demonstrated by multiple previous studies[3] and is due to several causes. First, recent studies have shown that FDG-PET is insufficiently sensitive for the detection of bone marrow involvement in DLBCL at baseline.[4] This, in turn, indicates that FDG-PET cannot confirm bone marrow remission status at the end of treatment. Second, the spatial resolution of current FDG-PET systems is only 6 to 7 mm. Consequently, it cannot detect residual microscopic lymphoma deposits at the end of treatment. The latter notion is supported by multiple studies that reported that radiation therapy reduces the risk of disease relapse and improves survival in DLBCL patients (including patients with advanced-stage DLBCL) who acquire complete remission, according to end-of-treatment FDG-PET.[5-8] Finally, it is well known that patients with incurable, baseline FDG-avid indolent lymphomas treated with immunochemotherapy or palliative DLBCL patients treated with a noncurative chemotherapy regimen may achieve a complete remission status according to end-of-treatment FDG-PET, but this does not signify the absence of residual microscopic disease.

In conclusion, interim FDG-PET has limited prognostic value in DLBCL patients treated with R-CHOP. In addition, the majority of patients in whom R-CHOP eventually proves to have failed during follow-up have a negative end-of-treatment FDG-PET scan, which indicates that the sensitivity of this test for the detection of residual disease is lower than 50% in this setting.

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AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

Disclosures provided by the authors are available with this article at www.jco.org.

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