The Impact of 2-(18) Fluoro-2-Deoxyglucose Positron Emission Tomography/Computed Tomography (FDG-PET/CT) in Treatment Strategy of Hodgkin Lymphoma-Current Hematologic Concepts

Oana STANCA; Anca Roxana LUPU; Anca CIOBANU; Irina TRIANTAFYLLIDIS; Cecilia GHIMICI; Ileana Delia MUT

a “Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania
b Department of Hematology, Coltea Clinical Hospital, Bucharest, Romania

ABSTRACT

Positron emission tomography/computed tomography (PET/CT) is useful in staging of Hodgkin lymphoma (HL), for early response – adapted therapy and choosing an individualized therapy, and is useful in determination of disease extent in relapsed and refractory Hodgkin lymphoma. Interim PET using 2-(18) fluoro-2-deoxyglucose (FDG) and low dose CT performed in one scanning session (FDG-PET/CT) helps to predict outcome in Hodgkin lymphoma and to assess therapeutic stratification.

Keywords: PET/CT, Hodgkin lymphoma, stage, response to treatment

Hodgkin lymphoma is a high curable hemopathy, but the treatment has acute and late related toxicity (1). The stage of disease defined according to Ann Arbor system and its Cotswold variant is an important prognosis factor and staging work-up include physical exam, imaging and bone marrow biopsy (1,2). PET/CT improves both quality and accuracy of staging identifying 25% more lesions than are found with conventional methods, including extranodal involvements. 18 FDG-PET/CT is recommend in the National Comprehensive Cancer Network guidelines for initial staging at the onset of Hodgkin disease/restaging at completion of therapy and to evaluate the response after treatment protocol (1).

FDG-PET/CT is also a sensitive and specific method for diagnosis of bone marrow involvement in pretreated patients with Hodgkin lymphoma and is useful to establish the score prognostic (3,4).
The controversies in the application of FDG-PET scan and PET/CT scan is the optimal timing to perform this imaging procedure: for staging, during therapy, after treatment, monitoring the disease in remission (5,6).

Early interim FDG-PET/CT is a predicting factor of progression-free survival in Hodgkin lymphoma and a positive result after few cycles of standard chemotherapy is an unfavorable prognostic factor for evolution in patients with advanced – stage or extranodal disease and may thus identify the patients with poor response (1,5,6).

In situation of advanced stage Hodgkin lymphoma doing PET after reduced intensity chemotherapy regimen can guide the need for additional radiotherapy (7).

Negative findings on an interim PET are important for chemotherapy-reduction strategy to avoid the treatment-related toxicity and to improve the quality of life (6).

Normal findings on the scan after therapy are highly predictive of a good prognosis (6). Some data show that a negative PET may be predictive after 2 cycles of chemotherapy.

In the United Kingdom the RAPID trial of 3 cycles of ABVD after which PET/CT negative patients are randomized in observation versus involved field radiation revealed that a progression-free survival about 5%-7% inferior is acceptable if radiation can be avoided (8,9).

PET-based risk – adapted approaches can be used to select patients with risk of failing to standard chemotherapy.

PET/CT is performed to assess the extent of disease before and after chemotherapy in Hodgkin lymphoma, the interim findings being helpful for identifying patients at high risk of treatment failure at an early time point when chemotherapy intensification could be considered (8).

The clinical trials demonstrates that planned surveillance for relapse in first remission after standard therapy by PET/CT scanning has no role in predicting outcome (9). Although PET/CT has a negative predictive value, this technique is the method to evaluate a clinically suspect relapse (1).

Clinical trials also recommend PET/CT scan to assess the response to secondary treatment of relapsed or refractory disease and to assess the response prediction before high-dose salvage chemotherapy and autologous hematopoietic stem cell transplantation (9,10).

In the current guidelines PET/CT scan has been accepted as standard of care at staging and to evaluate the response to initial standard regimen of chemotherapy (1). In clinical practice the patients with Hodgkin lymphoma should be treated within clinical trials investigating risk – and response adapted-treatment, avoiding the use of PET/CT results to guide therapeutic options in the absence of clear evidence from clinical trials (1,9).

Since 1990 PET/CT come into use, it has demonstrated superiority over PET, including better anatomical localisation, early assessment of chemosensitivity and making a clearer difference between pathological findings and normal physiological uptake (10). Because Hodgkin lymphoma is a disease more common in young people are important investigations accurately evaluating extent of disease and thus help to avoid excess treatment and its side effects: second malignancy, cardiovascular toxicity, lung’s late toxic effect, gonadal dysfunction.

Unlike conventional imaging procedures in Hodgkin lymphoma, PET and PET/CT scans provide additional informations on the stage of disease and items of predictors of response to treatment and outcome.

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REFERENCES


