OPEN

Citation: Blood Cancer Journal (2017) 7, e556; doi:10.1038/bcj.2017.39

www.nature.com/bcj

LETTER TO THE EDITOR

The prognostic value of 18-FDG positron emission tomography in T cell non-Hodgkin lymphoma

Blood Cancer Journal (2017) **7,** e556; doi:10.1038/bcj.2017.39; published online 21 April 2017

18F-fluorodeoxyglucose positron emission tomography (FDG-PET) scans are typically positive in patients with T cell non-Hodgkin lymphoma (T-NHL) and can assist in the diagnosis and staging of this uncommon malignancy. Previous studies have suggested that FDG-PET is a useful tool in initial staging of T-NHL; however, there is relatively little evidence for the role of the post-treatment FDG-PET in this patient population. Some published studies support the role of a negative post-treatment PET in predicting progression-free survival (PFS) and overall survival (OS),[1,2] while other studies have found that a negative interim or post-treatment PET does not predict outcome.[3,4] Recently published guidelines remain ambivalent about the utility of the PET scan in T-NHL, stating 'there is no clearly defined role for FDG-PET in this disease group'.[5] We aimed to evaluate the predictive value of interim and post-treatment PET scans in T-NHL to determine their effect on PFS and OS.

Patients who underwent a PET scan for a diagnosis of T-NHL from 2002 to May 2016 were retrospectively identified by a search of the medical records and NSW Cancer Registry in a single tertiary hospital. Demographics, treatments and survival outcomes were recorded in a de-identified database. Final PET results were correlated with PFS and OS outcomes. Ethics approval was obtained for the study. Kaplan − Meier survival analysis and the log − rank test were used to assess the difference in survival with a *P*-value of < 0.05 to indicate statistical significance.

A total of 47 patients were identified as eligible for inclusion, 29 were male (62%), with an average age of 52 years at diagnosis. Out of the total patients, 45 (96%) had an initial PET, 26 (62%) had an interim PET, and 39 (83%) had a post-treatment PET. The majority of patients had advanced disease at diagnosis, with an Ann Arbor stage of III or IV (70%) and an international prognostic index score of 2 or above (60%). The frequency of specific T cell histologies were anaplastic large cell, ALK-1 positive (15%), ALK-1 negative (24%), and unspecified (2%); peripheral T cell lymphoma not otherwise specified (28%); angioimmunoblastic T cell lymphoma (11%); subcutaneous panniculitis-like T cell lymphoma (4%); mycosis fungoides (4%); and others (6%). The majority of patients were treated with CHOP (cyclophosphamide, doxorubicin, vincristine and prednisone, 66%), with other chemotherapy regimens including CHOP with etoposide, HyperCVAD (cyclophosphamide, doxorubicin, vincristine, dexamethasone, methotrexate and cytarabine), SMILE (dexamethasone, methotrexate, ifosfamide, L-asparaginase and etoposide), and cyclosporine with prednisone. Radiotherapy alone was given in 6% of cases. Patients were followed up for a mean of 33.8 months. During the follow-up period, 22 patients progressed (47%) and 20 died (43%).

Those with a positive post-treatment PET scan ($n = 11$) had a median OS of 27.9 months (Figure 1). OS was not reached for those with a negative post-treatment scan ($P = 0.0017$). The median PFS for those with a positive post-treatment PET scan was 5.2 months, with PFS not reached for those with a negative scan ($P = 0.0012$; Figure 2). The interim PET scan did not appear to be significant in predicting PFS or OS in our cohort.

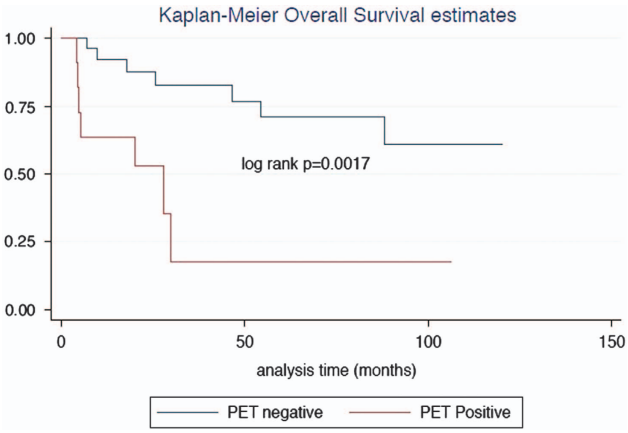

Figure 1. Kaplan – Meier overall survival curves for those with a negative post-treatment PET, compared to those with a positive post-treatment PET.

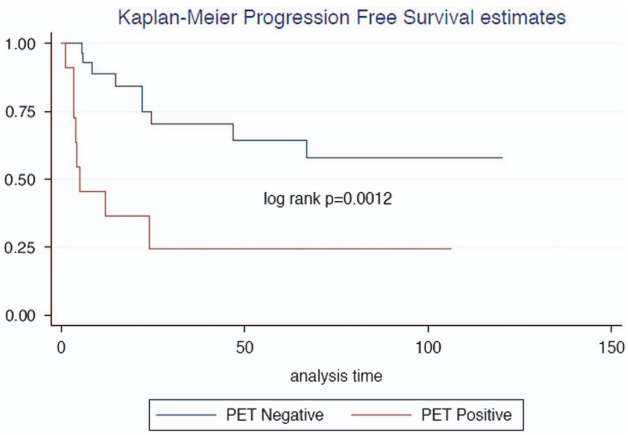

Figure 2. Progression-free Kaplan – Meier survival curves for those with a negative post-treatment PET, compared to those with a positive post-treatment PET.

The post-treatment PET scan appears to be of value in predicting both PFS and OS in T-NHL. Our study is limited by the low patient numbers due to disease rarity and the inherently heterogenous behaviour of the different subtypes of T-NHL. The retrospective, single-centre nature of the study is also an inherent limitation. Nevertheless, this study adds to the growing body of evidence supporting the importance of the post-treatment PET scan in predicting outcomes in T-NHL.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

R Eslick[1], L Dunlop[1], M Lin[2], D Hsu[1] and S Ling[1]
[1]*Department of Haematology, Liverpool Hospital, Sydney, New South Wales, Australia and*
[2]*Department of Nuclear Medicine and PET, Liverpool Hospital, Sydney, New South Wales, Australia*
E-mail: renee.eslick@sswahs.nsw.gov.au

REFERENCES

1 Li Y-J, Li Z-M, Xia X-Y, Huang H-Q, Xia Z-J, Lin T-Y *et al*. Prognostic value of interim and posttherapy ^{18}F-FDG PET/CT in patients with mature T-cell and natural killer cell lymphomas. *J Nucl Med* 2013; **54**: 507–515.

2 Tomita N, Hattori Y, Fujisawa S, Hashimoto C, Taguchi J, Takasaki H *et al*. Post-therapy ^{18}F-fluorodeoxyglucose positron emission tomography for predicting outcome in patients with peripheral T cell lymphoma. *Ann Hematol* 2015; **94**: 431–436.

3 Casulo C, Schoder H, Feeney J, Lim R, Maragulia J, Zelenetz J *et al*. ^{18}F-¯uorodeoxyglucose positron emission tomography in the staging and prognosis of T cell lymphoma. *Leuk Lymphoma* 2013; **54**: 2163–2167.

4 Cahu X, Bodet-Milin C, Brissot E, Maisonneuve H, Houot R, Morineau N *et al*. 18 F-fluorodeoxyglucose-positron emission tomography before, during and after treatment in mature T/NK lymphomas: a study from the GOELAMS group. *Ann Oncol* 2011; **22**: 705–711.

5 Barrington S, Mikhaeel N. When should FDG-PET be used in the modern management of lymphoma? *Br J Haematol* 2014; **164**: 315–328.