

Visual and quantitative assessment of interim 18F-fluorodeoxyglucose-positron emission tomography/computed tomography in children with Hodgkin lymphoma

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Introduction: The generally accepted visual assessment of Hodgkin's lymphoma (HL) with a 5-point scale (Deauville score, "DS") on interim PET/CT but the method may be subject to inaccuracies. One suggested way to solve this problem may be the use of a quantitative evaluation technique (qPET). This study aimed to assess the discrepancies between visual scoring (vDS) and a quantitative evaluation technique (qDS) of visually identified foci on interim scans.

Methodology: We conducted a retrospective, single-center study involving 115 pediatric HL patients diagnosed and treated under the EuroNet-PHL-C1 and DAL/GPOH-HD protocols. The median follow-up was 35 months, with 16 cases (13.9%) of relapse or progression observed. Event-free survival at three years was $86.3 \pm 3.3\%$. We evaluated visually detected foci for DS using qPET analysis through HERMES Medical Solutions software. Both visual and qPET assessments were performed on interim scans for foci with the highest metabolic activity.

Results: Our findings revealed a 30% discrepancy between vDS and qDS scores when analyzing interim PET/CT along with medical history, with no discrepancies when a DS5 score was assigned. Notably, 31 patients (27.0%) were overestimated by the visual scoring; specifically, 25 had a qDS score of 2 compared to a vDS score of 3, and 6 had a qDS score of 3 versus a vDS score of 4. Factors significantly associated with event-free survival included vDS score (hazard ratio: 2.49, $p = 0.009$) and the presence of bulk tumor mass (HR: 3.12, $p = 0.048$).

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Conclusion: Our study corroborates existing data showing that DS2 and DS5 scores reliably indicate metabolic remission and progression, respectively, serving as effective prognostic factors. However, for intermediate DS scores (DS3 and DS4), where visual assessment may be questionable, incorporating quantification software is recommended for improved accuracy.