**PEDIATRIC HODGKIN LYMPHOMA: VISUAL AND SEMIQUANTITATIVE ANALYSIS OF INTERIM 18FDG-PET/CT IN PREDICTING TREATMENT RESPONSE AND OUTCOME**

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## BACKGROUND-AIM

Interim 18FDG PET/CT (PET-2) helps predict outcome and tailor treatment in adults with Hodgkin Lymphoma (HL). In contrast, PET-2 data on pediatric HL are rare, with discordant results.
Visual analysis using Deauville Score (DS) was proposed to assess PET response. However a 5-point scale did not preclude inter-observer reproducibility issues. Alternative approaches were developed to improve the accuracy and reproducibility of PET-2, mainly based on PET semiquantitative parameters. We evaluated the clinical usefulness of PET-2, analyzing visually and semiquantitatively pediatric HL patients referred to a single center study.

## METHODS

18FDG PET/CT was performed in 27 pediatric HL patients at baseline (PET-0), after 2 cycles of chemotherapy (PET-2) and at the end of treatment. PET response assessment was carried visually according to the DS as well as semiquantitatively by use of absolute decrease in semiquantitative parameters from PET-0 to PET-2 ($\Delta$sumSUVmax0-2, $\Delta$sumSUVmean0-2, $\Delta$sumMTV0-2, $\Delta$sumTLG0-2) and the corresponding Response Indexes (RI%sumSUVmax0-2, RI%sumSUVmean0-2, RI%sumMTV0-2, RI%sumTLG0-2). Clinical response assessment was performed according the Cheson's Revised Response Criteria considering patients as responders (R) or non-responders (NR). Mean follow up was 24 months. T-student test for unpaired groups was performed to compare PET semiquantitative parameters between R and NR. Chi-square and Fisher exact test were performed to evaluate the association among categorical variables. The prognostic capability of 18FDG PET/CT was calculated by ROC analysis and expressed as area under curve (AUC). A Cox regression model was built to evaluate potential prognostic factors among PET parameters.

## RESULTS

5/27 (18%) patients were NR at the end of therapy based on clinical outcome and, among them, only one became R at 24 months follow-up; another one remained NR while the other two died. Visual assessment was: DS=1 in 14/27 (52%), DS=2 in 1/27 (3%), DS=3 in 4/27 (15%) and DS=4 in 8/27 (30%) patients. Differences between R and NR were statistically significant for $\Delta$sumSUVmax0-2 (t=2.45, p=0.026) and almost statistically significant for $\Delta$sumSUVmean0-2 (t=1.88, p=0.071). No significant difference was found for the other parameters. Any association among Deauville evaluation and outcome at the end of therapy was found (Fisher exact test p=0.136). The better AUCs resulted for $\Delta$sumSUVmax0-2 (0.836; cut-off<12.5, sensitivity 80%, specificity 91%). Any PET parameters resulted as prognostic factors by Cox regression. These results may also depend on the low number of events (NR).

## CONCLUSION

Semiquantitative analysis seems to be more accurate than visual analysis to interpret PET-2 and predict outcome in pediatric HL patients. In particular, $\Delta$sumSUVmax0-2 appears to be the best PET parameters in predicting therapy response assessment in pediatric HL patients. However these encouraging results warrant further confirmation in larger series.