

Impact of Non-FDG-Avid Areas Inside a Tumour Mass in Paediatric Hodgkin Lymphoma (PHL) Patients

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Congress Abstract

Aim: Necrotic areas within solid tumours are known to be a source of impaired progression-free and overall survival since anaerobic conditions may lead to the formation of hypoxia resistant cells. Necrotic areas do not show FDG-uptake in PET/CT. The aim of our investigation was to characterize this phenomenon within the population of PHL patients regarding frequency, localisation, therapy intensity and outcome.

Method: 1422 patients of the EuroNet-PHL-C1 trial were retrospectively reviewed for the occurrence of areas with missing tracer uptake inside the tumour lesions in FDG-PET/CT at initial staging and after 2 courses of OEPA. The volumes of no-uptake areas (NUA) were measured. Patient and disease specific data were compared between patients with and without NUA.

Results: 102 of the 1422 (7.2%) PHL patients displayed NUA, mostly within a mediastinal tumour bulk (93%). In 81% the NUA had disappeared or were markedly reduced and in 19% volume reduction was inadequate after 2 courses of OEPA. The average volume of the NUA decreased from 48.05 ml [range 0.24 – 524.76] on initial staging to 19.48 ml [range: 0 – 361.5]. Patients with NUA had in comparison to the control group: 1. a larger tumour volume (467 ml vs. 122 ml), 2. a higher rate of B-symptoms (59% vs. 39%, $p = 0.0001$) and 3. more indication for radiotherapy (81% vs. 53%, $p = 0.000$). 36 months progression free survival (PFS) between the two groups differed significantly ($p = 0.001$) even if only higher therapy groups (TG 2/3) were analysed ($p = 0.004$). The area of PET-positivity after 2 courses OEPA was in 66% located on the edge of the former NUA.

Conclusion: Tumour areas with locally missing tracer uptake at initial staging in PET/CT are a risk factor for PET-positivity after 2 courses of OEPA. Patients with NUA had a reduced PFS rate compared to patients without NUA after standard treatment.