

# The impact of the Point-spread-function (PSF) reconstruction on the response assessment in the Interim-PET (iPET) in Hodgkin lymphoma (HL)

**T. W. Georgi**<sup>1</sup>, L. Kurch<sup>1</sup>, D. Hasenclever<sup>2</sup>, D. Körholz<sup>3</sup>, O. Sabri<sup>1</sup>, R. Kluge<sup>1</sup>, C. Mauz-Körholz<sup>3</sup>

<sup>1</sup> *University of Leipzig, Department of Nuclear Medicine, Leipzig, Saxony, Germany*

<sup>2</sup> *University of Leipzig, Institute for Medical Informatics, Statistics and Epidemiology, Leipzig, Saxony, Germany*

<sup>3</sup> *Justus-Liebig-University Gießen, Department of Pediatric Oncology, Gießen, Hesse, Germany*

## Introduction

Within the EuroNet-PHL-C2 study the iPET result has an impact on the further treatment. The iPET assessment is done quantitatively by the qPET method (mean SUV of the hottest connected voxel inside the tumor divided by mean SUV of the liver). A qPET-value  $< 1.30$  corresponds to a Deauville score  $\leq 3$  and implies omission of radiotherapy (RTx). The aim of this study was to investigate the impact of the PSF reconstruction on the further treatment decision in comparison to a pure Ordered-subset-expectation-maximization reconstruction without PSF (OSEM) (current standard).

## Methods

The iPET datasets from 106 EuroNet-PHL-C2 patients were investigated. All datasets were available as PSF- as well as pure OSEM-reconstructions. The qPET-values were measured in both reconstruction forms. Based on these results, the influence of PSF concerning the treatment decision (RTx yes/no) was investigated.

## Results

98/106 HL patients showed tumor residuals in iPET. The PSF-qPET-values were 13.3% ( $\pm 17.1\%$ ) higher than the OSEM-values. These results would have induced a change of treatment in 16/106 patients. The main reason seemed to be the Time-of-Flight (TOF) reconstruction which was applied more often with PSF (84x) than with OSEM (18x). If OSEM and PSF were both reconstructed with or without TOF, the PSF-qPET-values were 4.1% ( $\pm 13.7\%$ ) higher and a change of treatment would have occurred in 2/36 patients. If only PSF was reconstructed with TOF, the PSF-qPET-values were 19.3% ( $\pm 15.9\%$ ) higher and the treatment would have changed in 13/61 patients.

## Conclusion

The PSF-qPET-values in iPET were higher than the OSEM-qPET-values, especially if PSF was reconstructed with TOF and OSEM without. In these cases, PSF would have induced a radiotherapy in additionally 21% of the patients.

## Acknowledgment

nothing to declare