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A comparison of two attenuation correction methods in 111In-Pentetriotide abdominal SPECT

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Abstract Introduction: Tomographic image can be degraded, partially by patient based attenuation. The aim of this paper is to quantitatively verify the effects of attenuation correction methods Chang and CT in 111In studies through the analysis of profiles from abdominal SPECT, correspondent to a uniform radionuclide uptake organ, the left kidney. **Methods and Materials:** Our study population consisted of 15 individuals, undergoing 111In-Pentetreotide tomography. 150-220 MBq were administrated intravenously and tomography performed approximately 4 hours after tracer administration. Tomographies were reconstructed using OSEM iterative method and then corrected using the 2 different methods: uniform Chang and nonuniform CT based. Transaxial slices were selected and profiles were drawn upon the left kidney, limiting the sample to 10-12 pixels. The mean error and correlation between non-corrected, Chang method and CT data was evaluated using the Student's t-test. **Results:** Decreased count rates were observed in the noncorrected slices, displaying a relatively low mean error and strong correlation with both correction methods, mainly with CT. The two methods showed a similar behaviour, with close count rates and mean errors in most of the cases and a strong correlation between them (≥ 0.85 in 80% of the cases). However, the CT presented relatively better results, with decreased mean errors in 73.3% of the cases and a stronger correlation with the non-corrected data (80% *vs.* 66.7%). **Conclusions:** In this specific region, a CT-based correction does not present such a significant improvement, as it would be expected in comparison to Chang method. Both methods show, however, better values than the non-corrected approach.

Keywords: Abdominal SPECT/CT, attenuation correction, Chang method.