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A comparison of two attenuation correction methods in ¹¹¹In-Pentetrotide 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.