



## (TECHNOLOGISTS PROGRAM)

(Proposed to be presented as Oral Communication or as a Poster)

### Abstracts List of Topics:

Physics & Instrumentation & Data Analysis

### 102. Image Reconstruction

Abstract Title:

**Comparative study between two distinct methods for attenuation correction and the use of no-attenuation correction for the assessment of relative uptake of  $^{99m}\text{Tc}$ -DMSA on pediatric patients**

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Referência: SC HES33 030

## Abstract Text:

**Introduction:** Although relative uptake values aren't the most important objective of a  $^{99m}\text{Tc}$ -DMSA scan, they are important quantitative information. In most of the dynamic renal scintigraphies attenuation correction is essential if one wants to obtain a reliable result of the quantification process. Although in DMSA scans the absent of significant background and the lesser attenuation in pediatric patients, makes that this attenuation correction techniques are actually not applied. The geometric mean is the most common method, but that includes the acquisition of an anterior (extra) projection, which it is not acquired by a large number of NM departments. This method and the attenuation factors proposed by Tonnesen will be correlated with the absence of attenuation correction procedures.

**Material and Methods:** Images from 20 individuals (aged 3 years  $\pm$  2) were used and the two attenuation correction methods applied. The mean time of acquisition (time post DMSA administration) was 3.5 hours  $\pm$  0.8h.

**Results:** The absence of attenuation correction showed a good correlation with both attenuation methods ( $r=0.73 \pm 0.11$ ) and the mean difference verified on the uptake values between the different methods were 4  $\pm$  3. The correlation was higher when the age was lower. The attenuation correction methods correlation was higher between them two than with the "no attenuation correction" method ( $r=0.82 \pm 0.8$ ), and the mean differences of the uptake values were 2  $\pm$  2.

**Conclusion:** The decision of not doing any kind of attenuation correction method can be justified by the minor differences verified on the relative kidney uptake values. Nevertheless, if it is recognized that there is a need for an accurate value of the relative kidney uptake, then an attenuation correction method should be used. Attenuation correction factors proposed by Tonnesen can be easily implemented and so become a practical and easy to implement alternative, namely when the anterior projection - needed for the geometric mean methodology - is not acquired.

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