

## Reliability of intrasubject absolute quantification of kidney function measured with $^{99m}\text{Tc}$ -DMSA in piglets

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Quantitative uptake of  $^{99m}\text{Tc}$  DMSA can be used to evaluate and monitor individual kidney function in children in longitudinal studies. Information is scarce concerning intrasubject validation of the tracer under minor physiological altered conditions.

### Aim:

to evaluate the reproducibility of quantification measures of kidney function in the same subject under alterations of hydration status and base excess in a limited time span prior to the examination.

### Materials and methods:

5 male castrated piglets, aged 10 weeks at the start, were included. Total duration of investigation was 4 weeks. The animals were kept in metabolic cages in order to collect urine and faeces separately.  $^{99m}\text{Tc}$ -DMSA was injected IV (ear vein) (dose:) 4 –5,5 hours prior to acquisition at 2 and 3 days alternating interval. All piglets were anaesthetized with a combination of midazolam (0.5mg/kg) and ketamine (dose:10mg/kg) IM. Urine (density, pH) and blood analysis (base excess, pH, pO<sub>2</sub>, pCO<sub>2</sub> and Hct) were performed. Information concerning absolute quantification was obtained from dorsal and ventral planar images with and without a standard.

*Experimental setting 1:* acquisitions were taken at 4 successive occasions under standardized conditions.

*Experimental setting 2:* each piglet was then subjected to a scan after: dehydration during 24h, hyper hydration (NaCl added to food: 5g/1kg food) and decreased pH (CaCl<sub>2</sub> added to food:).

*Quantification method:* Geometrical mean was calculated for both kidneys, corrected for background and attenuation.

### Results:

No significant intrasubject variability was noted, neither under standardized conditions, nor under altered physiological conditions.

### Conclusion:

This study demonstrates that physiological alterations of the hydration and metabolic status does not influence absolute quantification with  $^{99m}\text{Tc}$ -DMSA.