

Anatomical and clinical study on effects of sonography with pulse inversion and microbubble contrast in rabbit kidney

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SUMMARY

Aim of the present study was to evaluate by transmission electron microscope (TEM) modifications in rabbit kidney-parenchyma after submission to ultrasound contrast agent (UCA) with Pulse Inversion Harmonic Imaging (PIHI).

Seven inbred male albino rabbits were divided into three groups: 1) control group (n= 1 animal); 2) sonicated group (n= 3 animals); 3) sonicated group with UCA injection (CEUS) (n= 3 animals). The first group was not exposed to ultrasonography (US) and/or UCA. The second and third groups underwent baseline US and later to US with PIHI with a high mechanical index; in the third group UCA was simultaneously administered. Ultrastructural studies and image analysis were blindly performed on 50 samples (2mm³), including cortex and medulla, by two experienced pathologists with TEM.

By TEM observations of the first and second groups showed no structural modifications of renal cortex and medulla. TEM observations of the third group showed ultrastructural changes of renal corpuscle, proximal and distal convoluted tubules and collecting tubules; further in the most of observed sections the filtration membrane had an alteration of typical trilaminar pattern and vacuolisation of glomerular endothelial cells with irregular edges. Therefore in rabbit kidney submitted to CEUS some ultrastructural modifications were observed.

INTRODUCTION

It is known that the human parenchymas, in the diagnostic imaging, are submitted to ultrasonic investigations to evidence their alterations.

To verify if after the ultrasound exposure the parenchymas show ultrastructural modifications some animal parenchymas (rabbit, rats) were submitted to sonication with /without contrast agent.