

Effect of chaetomelic acid on hematocrit, urine specific gravity and urinary volume values in a rat model of renal mass reduction

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Introduction

The development of chronic renal disease has been frequently investigated using the 5/6 renal mass reduction model. Along time, the animals develop a syndrome of systemic and glomerular hypertension, hypertrophy, hyperfiltration, proteinuria, and progressive glomerular and interstitial fibrosis of the initially normal remnant nephrons. Due the clinical relevance of this problem, some therapeutic and experimental options have evolved over the time to improve the recovery of renal injury or to successfully prevent this disease. One of drugs used in experimental studies is chaetomelic acid (CA) a potent and highly specific inhibitor of ras farnesyl-protein transferase that seems to reduce both functional and histological damage in uninephrectomized rats subjected to renal ischaemia-reperfusion injury.

Objective

The aim of this work was to evaluate the effect of chronic treatment with CA on hematocrit, urine specific gravity and urinary volume in a model of renal mass reduction.

Material and methods

Fifty-two male Wistar rats were subjected to 5/6 nephrectomy (RMR) or sham-operated (SO). Surgical reduction of renal mass was performed under anesthesia with ketamin at 70mg/Kg (Imalgene® 1000, Merial S.A.S., Lyon, France) and xilazin at 10mg/Kg (Rompum® 2%, Bayer S.A., Kiel, Germany). Animals from RMR groups were subjected to right uninephrectomy and removal of both poles of the left kidney and rats from sham-operated groups were submitted to the same surgical technique without reduction of renal mass. One week after surgery, rats have been placed in four experimental groups: RMR rats without treatment (n=13); RMR rats treated with CA (n=13); SO rats without treatment (n=13); SO rats treated with CA (n=13). CA was intraperitoneally administered in a dose of 0.23 µg/Kg three times a week for three months. Once-a-month were collected blood and urine samples to determine haematocrit value, urinary volume and urine specific gravity.

Results and Discussion

We observed that animals from SO groups showed a higher hematocrit (Figure 1) and urine specific gravity (Figure 3), and a lower urinary volume (Figure 2) than animals from RMR groups ($p<0.05$). These results are in accordance with studies of this renal mass reduction model previously published. Animals from RMR group with treatment showed a higher urine specific gravity than animals from RMR group without treatment ($p<0.05$). In other groups we did not observe differences between treated and no treated animals.

Conclusion

These results suggest that three months of treatment with CA does not have a beneficial effect on hematocrit, urine specific gravity and urinary volume. However, these are preliminary data that warrant a larger scale study.

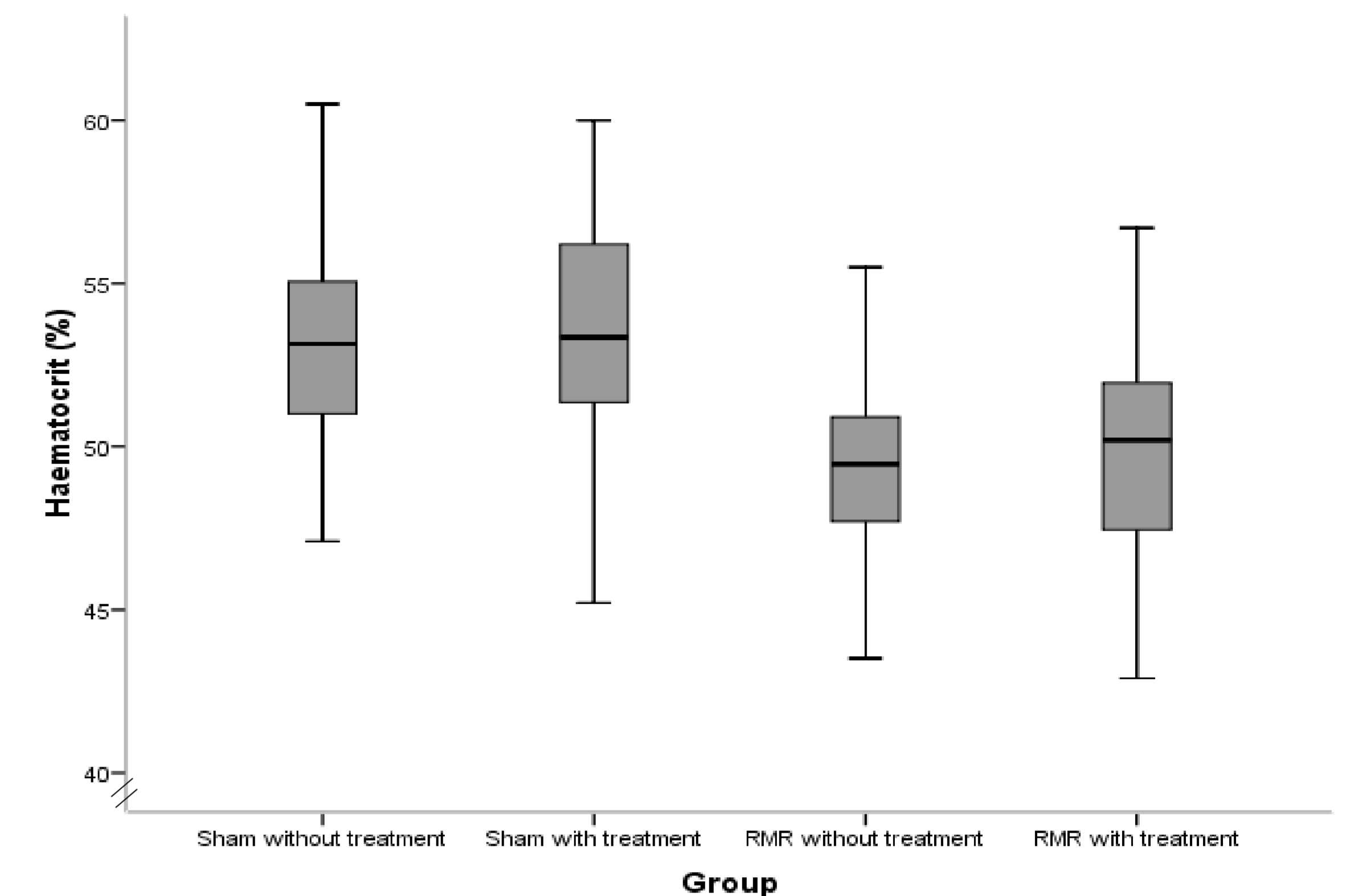


Figure 1. Determination of haematocrit (%) in groups: Sham without treatment, Sham with treatment, RMR without treatment and RMR with treatment.

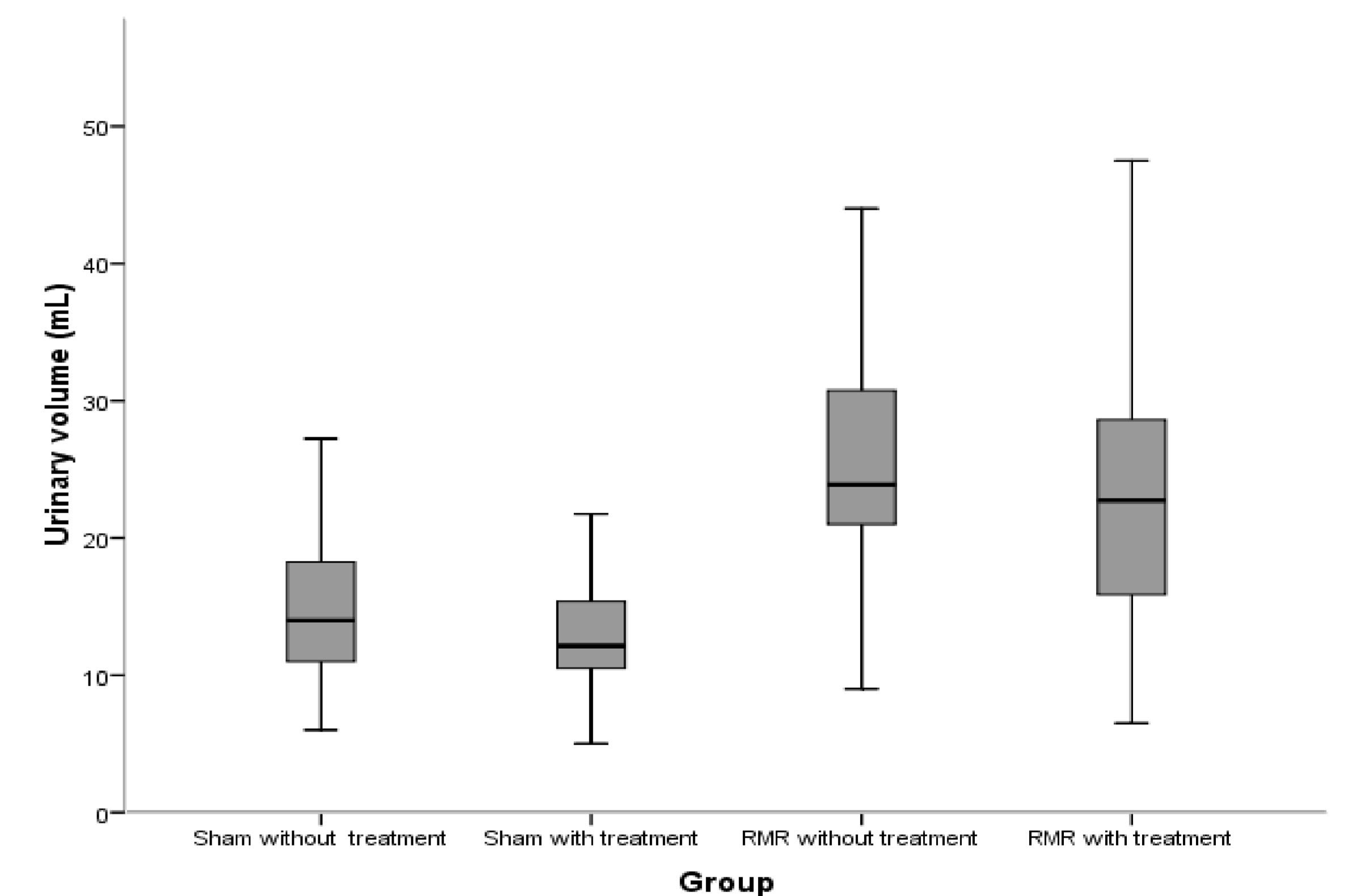


Figure 2. Measurement of urinary volume (mL) in groups: Sham without treatment, Sham with treatment, RMR without treatment and RMR with treatment.

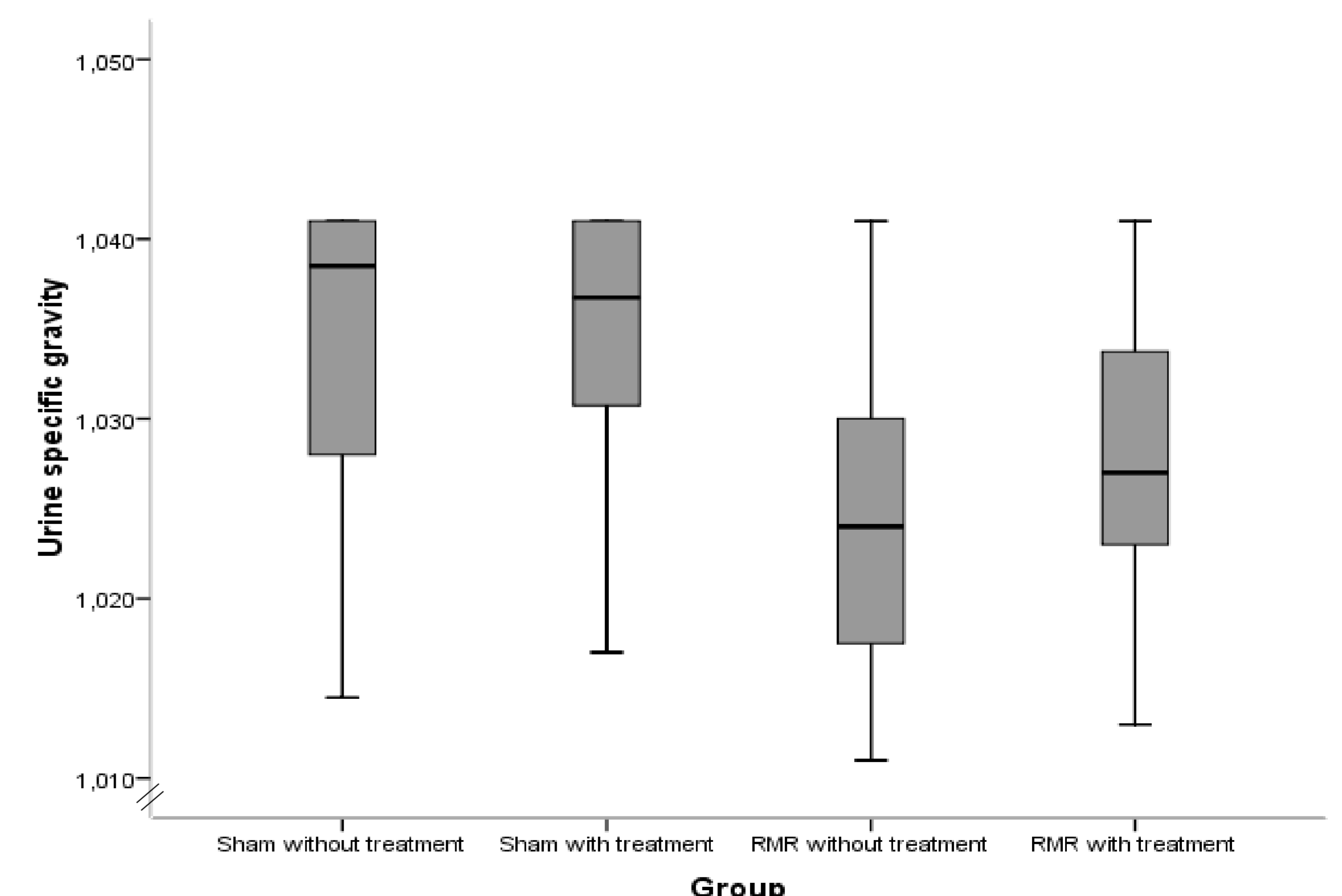


Figure 3. Determination of urine specific gravity in groups: Sham without treatment, Sham with treatment, RMR without treatment and RMR with treatment.

Bibliography

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