CHANGES IN RENAL PAPILLARY DENSITY AFTER HYDRATION THERAPY IN CALCIUM STONE FORMERS

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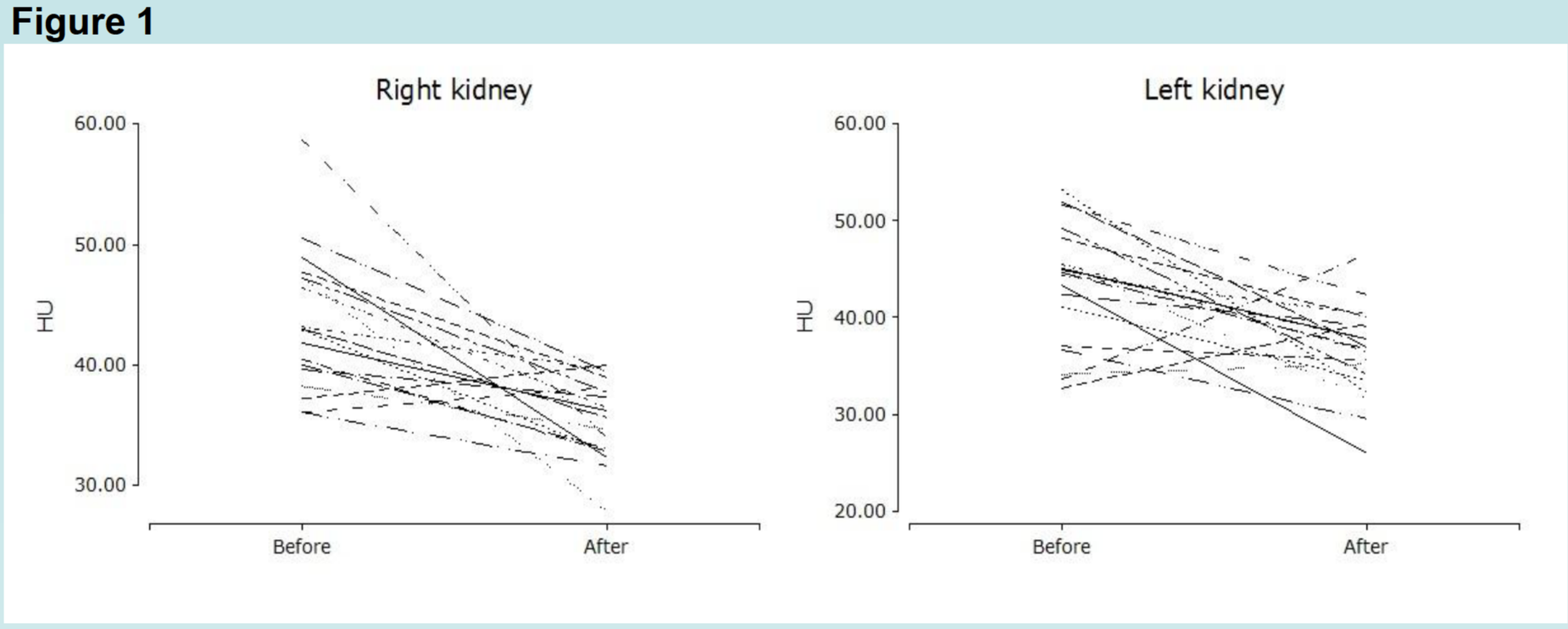
Objectives:

Calcium stone formers have higher values of renal papillary density compared with unaffected subjects. This phenomenon might be due to lithogenic processes leading to the deposition of calcium and formation of Randall plaques. To date, the effect of hydration therapy on renal papillary density of calcium stone formers is not known.

Methods:

We enrolled 19 calcium stone formers (>50% of the stone made of calcium salts) who were prescribed >2 L/day of a hypotonic, oligomineral water low in sodium and minerals (fixed residue at 180° C <200 mg/L) after endoscopic removal of their stones. Renal papillary density was evaluated on CT scans performed before the urological procedure and 6 months after the hydration course and expressed in Hounsfield Units (HU) as an average of 6 papillae per kidney. Differences were analyzed with the paired t-test.

Figure 1



Results:

Average age of the 19 enrolled patients was 56.8 ± 18.2 years, 17 (89.5%) of whom were males. Average values of papillary density before urological interventions were 43.6 ± 5.9 HU for the right kidney and 43.4 ± 6.2 HU for the left kidney. After 6 months of hydration, average values decreased to 35.5 ± 3.3 HU for the right kidney and 36.4 ± 4.7 HU for the left kidney; the difference was statistically significant for the right kidney (average difference −8.2 HU, 95% confidence interval [CI] −11.6, −4.7; $p < 0.01$) as well as for the left kidney (−7.1 HU, 95% CI −11.0, −3.1; $p < 0.01$) (Figure 1).

Conclusions:

In calcium stone formers, hydration therapy is associated with a significant reduction in renal papillary density. Our data suggest a potential role of hydration therapy in reducing the medullary deposition of calcium and formation of Randall plaques.

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