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## Influencing residual stone size and stone-free rate subsequent to flexible ureteroscopy – Evidence-based “means to an end” by combination potassium, magnesium citrate and pyridoxine within a prospective, randomized-controlled clinical trial

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**Introduction & Objectives:** The aim of the study was to evaluate the impact of combination potassium, magnesium citrate and pyridoxine treatment in renal lithiasis' cases of residual stone fragments secondary to digital flexible ureteroscopy (FURS) and holmium laser lithotripsy.

**Materials & Methods:** A total of 150 consecutive patients with renal calculi up to 2 cm treated by holmium-assisted FURS and subsequently presenting residual stone fragments of 3-5 mm were prospectively enrolled and equally randomized in the two study arms. As additional selection criteria, patients with calcium oxalate, calcium phosphate, uric acid or cystine lithiasis confirmed by the postoperative crystallographic analysis of the FURS extracted calculi were exclusively included. The 75 patients of the study arm underwent potassium, magnesium citrate and pyridoxine combination oral therapy for 6 months, while in cases of the control arm, solely the diet and hydration classical management was applied. All patients were evaluated immediately after surgery as well as during the 6 months' follow-up by abdominal ultrasound, KUB and intravenous pyelogram or contrast CT scan, urinary pH and citrate excretion.

**Results:** No significant differences were determined between the 2 series during the initial postoperative check-up with regard to mean stone size, total number of detected residual fragments, mean urinary pH and citrate excretion. At 6 months, the control group emphasized no substantial variations as to the latter two parameters (from 5.54 to 5.48 and from 219.15 to 226.37 mg/dL, respectively). On the other hand, the study arm displayed a statistically significant increase at the end of oral treatment in the mean citrate excretion (from 225.84 mg/dL to 549.36 mg/dL) and urinary pH (from 5.49 to 6.81). The 6 months stone expulsion rate (26.7% versus 19.5%), mean residual stone size reduction (2.39 versus 1.57 mm) and proportion of stone-free patients (84.6% versus 72.0%) were significantly improved among cases of the study series undergoing the combination therapy when compared to the standard regime series.

**Conclusions:** The combination of potassium, magnesium citrate and pyridoxine induced statistically significant increases in the mean urinary citrate excretion and pH after 6 months of treatment. As a consequence, a substantially positive clinical impact was emphasized in the study arm of the trial, as confirmed by the significant reduction in stone burden and residual lithiasis cases' proportion, with the concomitant benefit of an enhanced stone expulsion capacity.