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IMPACT OF URINARY STONES COMPOSITION ON ESWL EFFICIENCY
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Introduction. The extracorporeal shock wave lithotripsy (ESWL) is a non-invasive and very effective treatment method for kidney collector system and ureteropelvic junction calculi. It is the first choice of treatment for urolithiasis if stone diameter is less than 2cm, but is substantiated that efficiency of ESWL is dependent on many factors such as stone localization, and ESWL parameters. Due to increased treatment costs of repeated ESWL it is crucial to find out other factors, such as calculi composition, which affect the procedures effectiveness. In case of ineffective ESWL procedure, endoscopic treatment methods should be applied.

Aim: to estimate extracorporeal shock wave lithotripsy (ESWL) efficiency depending on urinary tract calculus chemical composition identified by infrared spectroscopy.

Methods. Retrospectively 53 cases analyzed of patients who were treated for nephrolithiasis in Vilnius University Santariskiu Clinics department of Urology during January 2012- December 2016. The research includes only cases with endoscopic procedures, performed after ESWL treatment. Detected kidney stones during endoscopy were analyzed by spectrophotometry method and divided into three groups by structure (stones with calcium, uric acid and magnesium-ammonium-phosphate). Calculi of each composition were divided into three groups, regarding destruction success ESWL procedure: success (stone destruction with spontaneous passage), partial success (stone decomposition without spontaneous passage) absolute failure (stone unchanged). Data was processed with Microsoft Excel 2016, and analyzed by IBM SPSS[®] (version 23.0). Differences were considered to be statistically valid if $p < 0,05$.

Results and discussion. 53 respondents were included into the research: women 41,5% (n=22) and men 58,5% (n=31). Average age 55, 58+- 14,524: women 55, 48+-11,639, men 56, 07+- 16,216. Stones with calcium were 83% (n =44). Uric acid stones -13% (n =7) and magnesium-ammonium-phosphate (struvite) - 4% (n= 2). ESWL efficiency depend on calculus chemical compounds ($p = 0,13$, $p < 0,05$). Stones with calcium success rate: success - 6,8% (n=3), partial success - 34,1% (n=15), absolute failure - 59,1% (n=26). Uric acid stones group success rate: success - 0%, partial success - 100% (n=7), absolute failure - 0%. Magnesium-ammonia-phosphate group: success - 0%, partial success - 0%, absolute failure -100% (n=2).

Conclusions. 1. ESWL efficiency is dependent on calculus chemical composition. 2. Stones with calcium are more resistant to treatment: 59,1 percent of stones do not fragment. 3. Infrared spectroscopy is reliable method to investigate stone composition and predict ESWL treatment outcome.