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Introduction & Objectives: Urinary sepsis is the main complication after performing ureterorenoscopy for the treatment of lithiasis. Therefore we have developed a predictive model in order to identify those patients with the highest risk of developing this complication.

Materials & Methods: We collected the ureterorenoscopies performed in our center between January 2010 and December 2017, identifying those patients who developed urinary sepsis in the first 30 days. We evaluated 25 variables related to comorbidities, clinical symptoms, lithiasic characteristics and applied endourological treatment. An univariate and multivariate analysis was performed to identify those factors associated independently to the appearance of urinary sepsis, developing a predictive model by logistic regression using a backward strategy. The internal validity of the model was evaluated using the Hosmer-Lemeshow test (calibration) and the area under the ROC curve (discrimination).

Results: 678 ureterorenoscopies were performed in the study period, 54 developed sepsis (7.9%). The univariate analysis showed that female sex (14 vs 4.4%, $p < 0.001$); positive urine culture (40.6 vs 1.8%); as well as symptomatic debut (9.5 vs 1.6%, $p = 0.001$) or as urinary sepsis (36.7 vs 4.1%; $p < 0.001$) of the lithiasis, the use of antibiotic therapy (20.6 vs 5.6%; < 0.001) or double J (15.5 vs 4.1%; $p < 0.001$) in the clinical debut were significantly associated with the risk of sepsis. Regarding the lithiasic characteristics, the renal localization (13.9 vs 6.9% $p = 0.02$), the stone burden (17.5 vs 11.96 mm, $p < 0.001$) and presence of more than one stone (17, 7 vs 5.4%, $p < 0.001$) were significantly associated with the risk of sepsis. Finally, bilateral endourological treatment (26.3 vs 7.5%, $p = 0.02$), flexible ureterorenoscopy (13.1 vs 7.7%, $p = 0.02$), surgical time (67.68 vs 54.61 min; $p = 0.002$), double J (9.8 vs 0.8%, $p = 0.02$), leave residual lithiasis (17.2 vs 5.1%, $p < 0.001$) or maintain the antibiotic after surgery (13.1 vs 5, 4%; $p = 0.001$) were significantly associated with the risk of sepsis. The multivariate analysis identified positive preoperative urine culture (OR*24.2, $P < 0.001$), debut of the lithiasis with sepsis (OR10.9, $p < 0.001$); renal localization of the lithiasis (OR5.8, $p = 0.006$) and the stone burden (OR1.4, $p = 0.02$) as factors independently associated with the development of sepsis. With these data the predictive model defined by the formula was elaborated: $P(\text{sepsis}) = 1 / (1 + e^{-(4,893 + 0,074 \text{lithiasicburden} + 1,327 \text{sepsisatdiagnosis} - 1,204 \text{renallocation} + 3,145 \text{positiveculture})})$ The model's calibration using the Hosmer-Lemeshow test was 0.54. The area under the ROC curve was 0.90 (0.86-0.94), which implies a high probability of the model predicting the urinary sepsis event in the study sample.

Conclusions: The factors associated independently to the appearance of urinary sepsis has allowed us to develop a predictive model with good internal validity. This model requires external validation to confirm the results.