Abstract

Background: High grade vesicoureteral reflux (VUR) is associated to long term renal outcome. Regarding to current guidelines for febrile UTI, prevalence of VCUG avoidance increases, and high grade VUR can be missed without performing voiding cystourethrogram (VCUG). We aimed to establish a model to predict VUR grade IV-V in young children presented with febrile urinary tract infection (UTI).

Methods: We retrospectively reviewed children aged 2-60 months presented with febrile UTI who underwent both renal and bladder ultrasonography (RBUS) and VCUG during 2004-2013. Risk factors of VUR grade IV-V were analyzed by multivariate logistic regression. Predictive model and scoring system were developed.

Results: Of the 329 children with febrile UTI, VUR grade IV-V was detected in 47 (14.3%) children. The independent risk factors for VUR grade IV-V were abnormal bladder emptying (β: 2.84; odds ratio (OR): 17.17), recurrent UTI (β: 2.12, OR: 8.35), non-*Escherichia coli* pathogen (β: 1.13, OR: 3.11), and abnormal RBUS (β: 1.29, OR: 3.66). The predictive model showed an area under of the receiver operating characteristic curve of 0.81 (95% confidence interval [CI]: 0.75-0.88, p<0.001). The predicted score was calculated, as follows: [3 x abnormal bladder emptying (0-1 point)] + [2 x recurrent UTI (0-1)] + [1 x non-*E. coli* (0-1)] + [1 x abnormal RBUS (0-1)]. Cutoff points of 1 showed sensitivity and specificity of 91.5% and 57.8%, respectively, while score of more than 1 increased the probability of VUR grade IV-V.

Conclusion: Combination of independent predictors and use of the predictive score improve the decision regarding the need for VCUG.