



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

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Clinical Predictors of urological intervention in children with a first febrile urinary tract infection

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Objectives : Urological interventions after pediatric febrile urinary tract infection (UTI) are guided by clinicians' expert judgement based on risk factors for vesicoureteral reflux, recurrent UTI, and renal scarring. We sought clinical predictors of undergoing a urological intervention using variables available at the time of an outpatient UTI diagnosis.

Methods : We retrospectively reviewed the medical records of 2,155 children aged <10 years who experienced their first febrile UTI. Among the clinical factors assessed at the time of UTI diagnosis, those associated with subsequent urological intervention were identified using multivariate analysis. The sensitivity and specificity of renal and bladder ultrasonography (RBUS) for predicting urological intervention were evaluated when RBUS was performed universally and selectively based on the identified predictors.

Results : Of the 2,155 children, 88 (4.1%) eventually underwent a urological intervention. Hospitalization or antibiotic use within the preceding month ($p < 0.001$), age ≥ 24 months ($p < 0.001$), infection with a non-E. coli pathogen ($p < 0.001$), failure to achieve defervescence ≤ 2 days after antibiotic therapy ($p = 0.038$), and peak body temperature > 39.0 °C ($p = 0.007$) were independently associated with undergoing a urological intervention. Among the 2,047 children who underwent RBUS, 993 (48.5%) had at least one identified predictor. Universal ($n = 2,047$) and selective ($n = 993$) RBUS demonstrated similar sensitivity and specificity for predicting urological intervention, while selective use reduced RBUS utilization by approximately 50%.

Conclusions : Applying clinical predictors of urological intervention may be used to guide selective RBUS in children after their first febrile UTI.

Table1.jpg



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Factor	Non-intervention group (n = 2,067)	Intervention group (n = 88)	p-value
Study period			
2010-2014	1,001 (48.4)	49 (55.7)	0.182
2015-2019	1,066 (51.6)	52 (44.3)	
Sex			
Male	1,381 (66.8)	52 (59.1)	0.133
Female	686 (33.2)	36 (40.9)	
Age ≥24 months	135 (6.5)	21 (23.9)	<0.001
Fever duration ≤2 days before antibiotic therapy ^a	1,693 (82.1)	69 (78.4)	0.383
Peak body temperature >39.0 °C ^b	762 (37.5)	51 (58.0)	<0.001
Family history of urinary tract infection	10 (0.5)	1 (1.1%)	0.369
Preterm birth	89 (4.3)	4 (4.5)	0.790
Underlying medical conditions	50 (2.4)	4 (4.5)	0.279
Hospitalization/antibiotic use within the preceding 1 month	74 (3.6)	14 (15.9)	<0.001
Concurrent febrile illnesses			
Upper respiratory infection	205 (9.9)	6 (6.8)	0.338
Lower respiratory infection	144 (7.0)	6 (6.8)	0.957
Pathogen			
Non-E. coli pathogen	31 (1.5)	0 (0.0)	0.636
Non-susceptible to empirical antibiotics ^c	241 (11.7)	18 (20.5)	0.014
Response to antibiotic therapy			
Defervescence during empirical therapy ^d	1,960 (96.1)	77 (87.5)	<0.001
Defervescence ≤2 days after antibiotic therapy ^e	1,850 (95.1)	74 (85.1)	<0.001

Table1.jpg

Factor	Odds ratio	95% confidence interval	p-value
Age ≥24 months	3.77	2.14–6.67	<0.001
Peak body temperature >39.0 °C	1.90	1.20–3.03	0.007
Hospitalization/antibiotic use within the preceding 1 month	4.03	2.09–7.78	<0.001
Defervescence >2 days after antibiotic therapy	2.06	1.04–4.08	0.038
Non-E.coli pathogen	3.51	1.97–6.25	<0.001
Pathogen non-susceptible to empirical antibiotics	1.72	0.98–3.03	0.060