



Urinary symptom management in children with neuropathic bladder presenting to the emergency department

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Background

- Children with neuropathic bladders are at high risk for developing urinary tract infections (UTIs)
- The accurate diagnosis of UTI is complicated by altered sensation and the ubiquity of bacterial colonization of the urinary tract
- Overdiagnosis and overtreatment for presumed UTIs is common

Objective

To estimate potential overdiagnosis and unnecessary antibiotic treatment in children with neuropathic bladder presenting to the Emergency Department (ED) with urinary symptoms

Methods

- Retrospective cohort study of patients with neuropathic bladder presenting to the Children's National Hospital ED between Oct 2008 and Dec 2019
- Chart review was used to determine presenting symptoms, urinary evaluation, and antibiotic treatment
- Validated urinary symptoms questionnaire (USQNB-IC) was used to categorize ED visits as 'evaluation warranted' if the patient presented with at least one of the actionable symptoms found on the questionnaire
 - <https://www.medstarnrh.org/our-services/spinal-cord-injury-rehabilitation-services/urinary-symptoms-questionnaire/>
- Spina Bifida Association's published definitions for UTI were used to determine which patients warranted presumptive antibiotic treatment, which includes presence of pyuria, positive urine culture with >50,000 colony forming units/mL from a catheterized specimen or >100,000 from a voided sample, and presence of symptoms (including fever ($\geq 38.0^{\circ}\text{C}$) +/- other symptoms for children under age 6 years)
 - <https://www.spinabifidaassociation.org/guidelines/guidelines-by-age/>

Table 1: Descriptive characteristics of children with neuropathic bladder seen in CNH ED between October 2008 and December 2019.

Number of ED visits	253
Number of unique patients	82
Mean age at ED visit	5.1 years (SD 4.4 years)
Gender	
Male	47 (57%)
Female	35 (43%)
Presenting symptoms	
Fever	99 (39%)
Emesis	67 (26%)
Abdominal pain	43 (17%)
Foul-smelling urine	21 (8%)
Cloudy urine	13 (5%)
Nausea	9 (4%)
Back pain	8 (3%)
Incontinence	1 (0%)

Results

Table 2: Urinary evaluation (UA and/or urine culture) in children with neuropathic bladder seen in CNH ED between October 2008 and December 2019.

	Evaluation warranted N (% of total visits)	Evaluation not warranted N (% of total visits)
Urinary evaluation	131(52%)	19(8%)
No urinary evaluation	25(10%)	78(31%)

Table 3: UTI treatment in children with neuropathic bladder seen in CNH ED between October 2008 and December 2019.

	Fulfilled SBA's UTI definitions N (% of visits with urinary evaluation)	Did not fulfill SBA's UTI definitions N (% of visits with urinary evaluation)
Treated with antibiotics	40(27%)	56(37%)
Not treated with antibiotics	2(1%)	54(36%)

Conclusions

- Most children with neuropathic bladder presenting to the ED were appropriately evaluated and treated for presumed UTI
- Over one-third of children evaluated for UTI received empiric antibiotics despite not meeting SBA criteria for UTI, indicating this may be a target for educational initiatives to promote antibiotic stewardship
- Further research is needed to generate and validate clinical guidelines for emergency department providers to limit unnecessary testing and antibiotic therapy in this population