



Contemporary Clinical Epidemiology of Pediatric *Shigella* spp. Infections in Houston, TX, 2016-2021

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Background

- Infections due to *Shigella* are a significant cause of morbidity in children.
- A comprehensive contemporary epidemiology of pediatric *Shigella* spp. infections in all geographic locations in the United States is not well described.

Methods

- We used a retrospective cohort of patients (0-18 y/o) from a large network of hospitals in Houston, TX.
- Only patients with *Shigella* spp. isolated from clinical samples dated from 2016 to 2021 were included in the study.
- Demographic, clinical, and microbiological data and susceptibility profile were extracted from the medical records.

Table 1. Characteristics of pediatric patients with *Shigella* spp. infections 2016-2021

Characteristic	<i>Shigella</i> n=73 (% , IQR) ¹
Total	73
Median age	5 (IQR, 3-8)
1-4 y/o	27 (37)
5-9 y/o	36 (49)
11-18 y/o	10 (14)
Gender	
Male	32 (44)
Female	41 (56)
Race	
African American/Black	16 (22)
Asian	2 (3)
Caucasian/white	18 (25)
Unknown	11 (15)
Other:	26 (36)
Ethnicity	
Hispanic	17 (23)
Non-Hispanic	40 (55)
Unknown	16 (22)
Hospital admission	23 (32)
Median length of stay	1 (IQR,1-2)
PICU	0

¹ Numbers in parentheses indicate percentage (%) except were indicated as interquartile range (IQR)

- We identified a total of 73 patients with a median age of 5.
- 80% of those with available clinical data (n=61) reported fever and 62% bloody diarrhea.

Table 2. Clinical features of pediatric patients with *Shigella* spp. infections 2016-2021

Characteristic ¹	<i>Shigella</i> n=61(%)
Past medical history	
Prematurity	3 (5)
Febrile seizures	2 (3)
Symptom or clinical finding	
Fever	49 (80)
Fever median duration (days)	1
Diarrhea (bloody)	38 (62)
Abdominal pain	39 (64)
Seizure	5 (8)
1-5 y/o	4
6-10 y/o	1
Abdominal tenderness	23 (37)
Exposure	
None	39 (64)
Daycare	6 (10)
Symptomatic ² (unconfirmed)	9 (15)
Symptomatic (confirmed)	2 (3)
Sexual assault	1 (2)
Pet/animal	4 (7)
Mother works in a nursing home	1 (2)
Food	2 (3)
Summer camp/swimming	2 (3)
Travel (international)	5 (8)

¹ Clinical information not available for *Shigella* (n=12) infections which were laboratory visits only.² Unconfirmed indicates exposure to individual with symptoms (e.g. diarrhea) but unknown etiology. Confirmed when known *Shigella* infection.

Results

Table 3. Treatment and outcome of pediatric patients with *Shigella* spp. infections 2016-2021

Treatment/Outcome	<i>Shigella</i> n=61 (%)
Treatment	19 (31)
Macrolide	1 (18)
Amoxicillin	1 (2)
Cephalosporin	7 (11)
Median length of treatment	5
Complications ¹	3 (5)
Recurrence/Readmission/Death	0

¹ urinary tract infections (n=1), septic shock (n=1), constipation (n=1)

- 32% of *Shigella* infected patients were hospitalized.
- 5 patients (8%) had a seizure (4 *S. sonnei* and 1 *S. flexneri*-3).
- 4 out of the 5 seizures were complex and all were associated with fever (>39 °C).
- 4 out of the 5 patients with seizures had either a history of febrile seizure or a family history of seizures.
- 90.4 % of *Shigella* spp. were *S. sonnei*.
- 5 patients (8%) reported a history of travel: Mexico (*S. sonnei* and *S. flexneri*), Italy (*S. flexneri*), Pakistan (*S. flexneri*), Guatemala (*S. flexneri*).
- No episodes of bacteremia were identified.
- Resistance to TMP-SMX was common (45/68, 66%) among *Shigella* spp. isolates tested.

Table 4. Microbiological features of pediatric *Shigella* infections 2016-2021

Characteristics	<i>Shigella</i> n=73(%)
Species-serotype	
<i>S. sonnei</i>	66 (90.4)
<i>S. flexneri</i>	6 (8.2)
<i>S. flexneri</i> -3	1 (1.4)
Source	
Blood	0
Stool	67 (92)
Urine	6 (8)
Resistance ^{1,2}	
Ampicillin (n=43)	7 (16) ³
TMP-SMX (n=68)	45 (66)
Levofloxacin (n=70)	2 (3) ⁴
Ciprofloxacin(n=30)	0
Ceftriaxone (n=5)	0

¹Number of *Shigella* isolates tested indicated in parentheses.²Susceptibility to Azithromycin was not performed. ³ 4/7 isolates resistant to ampicillin are *S. flexneri*.⁴ All *S. flexneri*.

Conclusion

- Infections due to *Shigella* spp. are a significant burden among pediatric patients in a major metropolitan health care system in Houston.
- Bloody diarrhea was a common presentation, although the presence of Shiga-toxin-positive isolates was unknown.
- The observed high frequency of resistance to TMP-SMX and emergence of multi-drug resistant *Shigella* spp. in other countries warrants continued surveillance.