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Case Report

Microbiology Section

A Rare Urinary Tract Infection by *Salmonella Paratyphi A*

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ABSTRACT

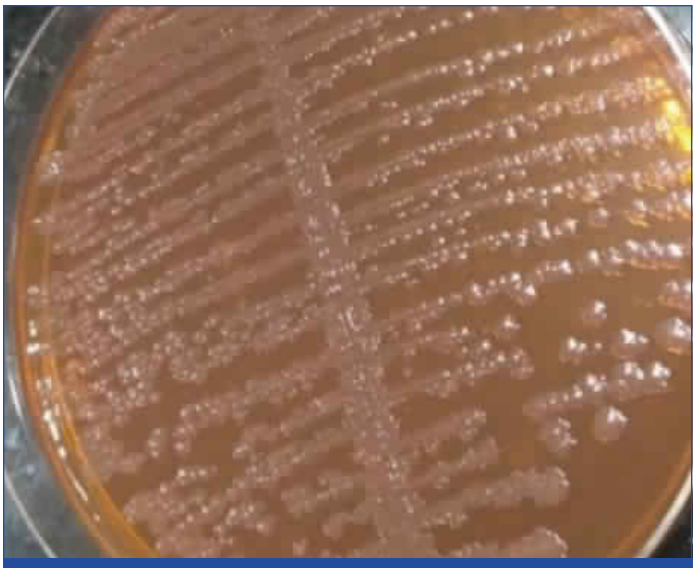
Urinary Tract Infection (UTI) caused by *Salmonella* is very rare and occurs mainly in immunocompromised patients, infants and those over 60 years of age. A 12-year-old patient admitted with history of fever, burning micturition and suprapubic abdominal pain, diagnosed with a rare variant of *Salmonella* from UTI which had showcased abnormal biochemical reaction unlike typical *Salmonella paratyphi A* reactions. Here, we are communicating the rare H_2S variant *Salmonella paratyphi A*, causing UTI which caused clinical and microbiological confusion in the diagnosis. A high suspicion is required for adequate diagnosis and treatment when non-lactose fermenting colonies are seen in the culture plate.

Keywords: H_2S variant *Salmonella* spp, Non-lactose fermenting colonies, Paediatric age group

CASE REPORT

A 12-year-old boy was admitted in the paediatric ward of the peripheral hospital with complaints of fever, pain abdomen and burning micturition for past 14 days. Fever was of high grade and was associated with chills followed by pain abdomen in suprapubic region which was insidious in nature and not associated with diarrhea and vomiting. No predisposing factor was present except a travel history to a gulf country two weeks before and returned to India a week before the presentation. None of the family members had similar features or any history of enteric fever.

Haematological parameters were in normal range. Liver and renal parameters were also normal. Blood and urine samples were sent to Microbiology laboratory for culture and susceptibility testing. Urine sample was inoculated into blood agar and MacConkey's agar following semi quantitative method. Blood agar had a count of $>10^5$ CFU/mL growth of gram negative bacteria and MacConkey's agar showed non-lactose fermenting colonies [Table/Fig-1] Biochemical test showed abundant H_2S production. *Salmonella paratyphi A* was confirmed as *Salmonella* group by Matrix-Assisted Laser Desorption Ionization-Time of Flight (MALDI-ToF), Mass Spectrometry (MS) and with serotyping. Antimicrobial susceptibility testing was performed by VITEK 2 system (bioMerieux, Inc., Durham, NC). Organism was sensitive to ceftriaxone, ciprofloxacin and trimethoprim/sulphamethoxazole. Blood culture was sterile. Widal test did not show any significant titer done in the first week of admission. *Salmonella* isolate was reconfirmed by another urine sample to rule out contamination. Consent was not given for the stool sample. Patient was empirically started with Amoxicillin-Clavulanic acid but after antibiotic susceptibility testing report, it was changed to Ceftriaxone. Repeat urine sample culture after one week also showed *Salmonella paratyphi A* with a count of $>10^5$ CFU/mL. No organism was seen in the urine culture plate collected after three weeks of therapy. Patient improved symptomatically and was discharged.



[Table/Fig-1]: MacConkey's agar showing non-lactose fermenting colonies.

DISCUSSION

Salmonella bacteriuria occurs in <1% cases of enteric fever even in the endemic areas like India [1]. The patient had no previous history of enteric fever as urinary shedding of *Salmonella* may occur several months after infection in a carrier. Prolonged *Salmonella* shedding is seen in patients with abnormalities of urinary tract or in case of nephrolithiasis [2]. In this patient we could not find any abnormalities. Initially, enteric fever was suspected and blood culture and WIDAL were sought but it was of no contribution to the diagnosis. Isolation of *Salmonella* in urine with findings of $>10^5$ colony forming units/mL in the patient suggested more in favour of a localised infection or previous unnoticed asymptomatic blood infection, rather than a carrier state. According to Abdullah FE et al., 36.6 % were *paratyphi A* among the isolated *Salmonella* strains from urine [3]. *Salmonella paratyphi A*, normally does not produce H_2S and such H_2S variants can be easily misdiagnosed as other non-fermenter like *Citrobacter* spp. and other *Salmonella* spp., leading to inappropriate antibiotic therapy [4]. As the identification was inconclusive, we had sent the isolate to reference *Salmonella* laboratory for typing but the strain was not typable. To the best of my knowledge this is one of the rarest cases of H_2S producing *Salmonella paratyphi A* possibly causing UTI. Probably he might have got the infection during his stay in gulf country where the *Salmonella paratyphi A* infection is endemic [2].

CONCLUSION

We conclude that *Salmonella paratyphi A* suspicion should also be there, whenever non-lactose fermenting gram negative organisms are grown in the culture medium and biochemical results are inconclusive. Identification of organism helps in better antibiotic

stewardship.

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