Letter to the Editor

Urinary tract infection due to Aeromonas spp., a lesser known causative bacterium

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Aeromonas spp. are often associated with diarrhoeal illnesses, soft tissue infections, blood-stream infections leading to sepsis, and intra-abdominal infections, among others [1]. Although *Aeromonas* was isolated many years ago, evidence implicating this genus as a cause of gastro-intestinal disease in humans has been amassed only since the early 1980s. They are a lesser known cause of urinary tract infection (UTI) and are not known uropathogens. So far there have been few case reports regarding UTI caused by *Aeromonas* spp. [2-6]. They have also been associated with haemolytic uremic syndrome [3]. Here, we present a series of cases of UTI due to organisms of this genus.

Seven cases of *Aeromonas* spp. infection were reported to the Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) hospital, Puducherry, between 2007 and 2009. All the cases were from different wards and outpatient departments with no observable common link between any cases. All of our patients had attended different clinics at different times and in different departments. No gender or age group trend was noted; five cases were below 50 years of age, while one case was above 60 years and one was below five years of age. Three patients were treated on an outpatient basis, while four required hospital admission (see Table). Urine samples from suspected cases of UTI received in the laboratory were subjected to culture onto cysteine lactose electrolyte deficient medium (CLED) by the semi-quantitative technique and microscopic examination. Four of the samples had demonstrable significant pus cells while three samples did not have any pus cells; the latter three cases presented with significant bacteriuria and the organism was isolated in pure culture. The CLED plates were examined after an incubation period of 18 to 24 hours and processed [7] per recommendations. Significant bacterial isolates were identified according to standard methods [7] and antimicrobial susceptibility testing was performed by the Kirby Bauer method according to the Clinical Laboratory Standards Institute guidelines [8]. All of our *Aeromonas* isolates were obtained in pure culture [9]. The biochemical tests applied were aesculin hydrolysis, Voges-Proskauer reaction, lysine decarboxylase, ornithine decarboxylase, arginine hydrolysis, indole production, and production of acid and gas from fermentation of glucose, arabinose, mannitol, and sucrose. Four of the strains were identified as *Aeromonas caviae*, two strains as *Aeromonas veronii*, and one as *Aeromonas* schubertii. We have isolated these strains from samples of different patients in different units and at different times; therefore we are confident they were not contaminants. Moreover, the same strain was isolated on more than one occasion from some of the patients; for instance, as in

Table. Details of the cases with UTI due to *Aeromonas* spp.

Age/sex	Inpatient/ Outpatient; Department	Clinical Diagnosis	Culture Isolate identification	Antibiotic susceptibility pattern	
				Resistant	Sensitive
36 years/ Female	Inpatient; Internal Medicine	UTI	*Aeromonas caviae*	Ciprofloxacin	Amikacin, Gentamicin, Ceftriaxone, ceftazidime,Nitrofurantoin, Meropenem
35 years/ Female	Inpatient; Obstetrics & Gynaecology	Preterm labour	Aeromonas veronii	None	Amikacin, Gentamicin, Ceftriaxone, Ceftazidime, Ciprofloxacin, Nitrofurantoin, Meropenem
44 years/ Female	Outpatient; Urology	Left renal calculus	Aeromonas schubertii	None	Amikacin, Gentamicin, Ceftriaxone, ceftazidime, Ciprofloxacin, Nitrofurantoin, Meropenem
25 years/ Male	Inpatient; Urology	Post urethroplasty	Aeromonas caviae	None	Amikacin, Gentamicin, Ceftriaxone, Ceftazidime, Ciprofloxacin, Nitrofurantoin, Meropenem
63 years/ Male	Outpatient; General surgery	Periurethral abscess	Aeromonas veronii	None	Amikacin, Gentamicin, Ceftriaxone, Ceftazidime, Ciprofloxacin, Nitrofurantoin, Meropenem
46 years/ Male	Outpatient; Urology	Pelvi-ureteric junction-obstruction	Aeromonas caviae	Gentamicin, Nitrofurantoin, Ceftriaxone	Amikacin, Ceftazidime, Ciprofloxacin, Meropenem
4 years/ Female	Inpatient; Pediatrics	UTI with chronic renal failure	Aeromonas caviae	Ciprofloxacin	Amikacin, Gentamicin, Ceftriaxone, Ceft-zidime, Nitrofurantoin, Meropenem

patient 4, who was admitted in the hospital and had submitted more than one sample. Samples were also sent for culture after completion of an antibiotic course in two patients, which showed the urine to be sterile.

Recently, members of the genus *Aeromonas* have been increasingly recognized as important human pathogens. Their changing phylogenetic relationship, evolving taxonomy, and controversial role in human disease have been a matter of concern. Currently, there are 14 valid genomospecies in the genus *Aeromonas* that are best differentiated by molecular methods [1]. The pathogenesis of urinary tract infection due to *Aeromonas* spp. has not been elucidated in any of the available literature; however, they are known to produce a number of putative virulence factors such as fimbriae and haemolysin [5]. These organisms can affect any age group. There have been reports of vaginal colonization with *Aeromonas* from normal pregnant females [10] and patients in labour [11].

Clinically relevant *Aeromonas* spp. are uniformly resistant to many beta lactams such as penicillin and ampicillin and they are known to produce many beta-lactamases. Aminoglycosides are usually active against this genus, though resistance has been reported.

Fluoroquinolones are highly active against *Aeromonas* spp., although nalidixic acid resistance [5, 6] and carbapenem resistance have also been reported [12]. In the present study, two of the isolates of *A. caviae* were resistant only to ciprofloxacin; one strain was resistant to nitrofurantoin, gentamicin, and ceftriaxone; and one strain was sensitive to all

the antibiotics tested (amikacin, genatmicin, nitrofurantoin, ciprofloxacin, ceftriaxone, ceftazidime, and meropenem). Both the isolates of *A. veronii* and *A. schubertii* were sensitive to all of the antibiotics.

The niche of *Aeromonas* is mainly marine water sources and Puducherry is a coastal city, flanked by the Bay of Bengal to the east. In our patients, we did not look for this epidemiological link. Although it is an uncommon uropathogen, the likelihood of its isolation from unusual sites, especially in coastal regions, cannot be overemphasized.

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