Urinary tract infection caused by nontypable *Haemophilus influenzae* in the elderly

Since the introduction of the *Haemophilus influenzae* serotype b (Hib) vaccine, the decrease in invasive Hib disease predominantly affecting children and the relative increase in nontypable *H. influenzae* (NTHi) infections have been well documented in many parts of the world. The increasing trend in the number of cases, especially among older adults, deserves attention (Heath et al., 2001; De Almeida et al., 2005; Dworkin et al., 2007; Tsang et al., 2007).

*H. influenzae* has been rarely implicated as the causative agent of urinary tract infections in adults. The isolation of *H. influenzae* from a urine sample was first reported in 1898 when Kretz recovered influenza bacillus from the urine sample of a 36-year-old man with haematuria and polyuria (Wright, 1905). Since then, fewer than 30 cases of this bacterium as the cause of adult urinary tract infections have been reported (Reichman, 1999; Papaioannides et al., 2002). In Sweden, a study over a 24-year period showed 36 children with *Haemophilus* species infection (Hansson et al., 2001; Campos, 1999). Urine culture collected after surgery inoculated on CLED agar was negative after 48 h. Treatment was initiated with i.v. 3 g/6 h ampicillin–sulbactam (1 g sulbactam + 2 g ampicillin) for 8 days, since the initial suspected aetiological agent of the infection was *H. influenzae*. After culture confirmation, the antibiotic therapy was parenteral 8 g/1 g per day (4 g/500 mg/12 h) for 8 days of piperacillin–tazobactam (Wagenlehner et al., 2003).

Negative slide agglutination for serotyping, biotyping and negative PCR capsular typing confirmed NTHi biotype VIII as the causative agent of infection. The NTHi strain isolated was nalidixic acid resistant (MIC >256 μg ml⁻¹), β-lactamase-negative, and sensitive to ampicillin and fluoroquinolones (ciprofloxacin, levofloxacin, lomefloxacin, moxifloxacin). After antibiotic therapy, the patient showed complete resolution of symptoms, return of normal function and normalization of blood parameters.

There are few reports of urinary tract infection caused by *Haemophilus* species. The inability of *Haemophilus* species to grow in standard media commonly used for culture of uropathogens suggests that the true frequency of these strains as a cause of urinary tract infections is underestimated. *H. influenzae* has rarely been implicated as the causative agent in urinary tract infections in adults, with most cases affecting men with anatomical or functional genito-urinary abnormalities. The true incidence of *H. influenzae* genito-urinary infection is unknown. The apparent rarity of *H. influenzae* urinary tract infection may be ascribed to three factors: (i) bacteriological media for recovery of uropathogens do not support the growth of *H. influenzae*; (ii) the organism is not generally part of the genitoperineal flora; and (iii) growth of *H. influenzae* is inhibited by urine even when it is supplemented with the necessary growth factors (Gabre-Kidan et al., 1984).

*H. influenzae* may be a more common uropathogen in adults than previously recognized. We should consider the use of more sensitive culture techniques and greater physician awareness of the genito-urinary pathogenicity of this bacterium, particularly in male elderly patients with anatomical or functional genito-urinary abnormalities, to enhance the detection of *H. influenzae* urinary tract infection. Therefore the nalidixic acid resistance of *H. influenzae* should be investigated according to the age of patients (Pérez-Vázquez et al., 2004). Prompt institution of therapy with antibiotics active against *H. influenzae* following sensitivity studies could prevent systemic septic complications in this group of frail patients.

Clearly, further studies are required to characterize the impact on pathogenicity and virulence of NTHi in unimmunized adult patients and the epidemiology of such micro-organisms. Also, nalidixic acid resistance may be useful as a baseline for future studies to monitor antimicrobial susceptibilities including susceptibility to fluoroquinolones.

To our knowledge, this is the first report of urinary tract infection caused by NTHi in adults in Brazil after the introduction of the Hib conjugate vaccine.
Acknowledgements
This study was supported by CAPES/CNPq/INCQS/FIOCRUZ/MS.

Antonio Eugenio Castro Cardoso de Almeida,1 Nathalia Gonçalves Santos Caldeira,1 Leticia Ferreira Lima Schroeder,1 Alice Aurora Batalha de Jesus,1 Lucia Rodrigues Serradas,2 Andrea Ferreira da Costa,2 Carla Ormundo Gonçalves Ximenes Lima2 and Ivano de Filippis1

1Instituto Nacional de Controle da Qualidade em Saúde (INCQS), Departamento de Microbiologia, Fundação Oswaldo Cruz (FIOCRUZ), Av. Brasil, 4365 – Manguinhos, 21045-900 Rio de Janeiro, Brazil
2Hospital de Clínicas RioMar Barra, Av. Cândido Portinari, 555 – Barra, 22793-310 Rio de Janeiro, Brazil

Correspondence: Antonio Eugenio Castro Cardoso de Almeida (eugenio.almeida@incqs.fiocruz.br)


