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A Case of *Streptococcus pneumoniae* Urinary Isolate

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Abstract

Streptococcus pneumoniae is not a common agent of urinary tract infection. Here we report a case of *S. pneumoniae* urinary isolate, which we thought might be important due to the urine analysis result, pure growth, and underlying diseases of patient.

Key words: urinary tract, *Streptococcus pneumoniae*, infection

Резюме

Streptococcus pneumoniae не е често срещан агент за инфекция на пикочните пътища. Настоящият доклад съобщава за случай на уринарен изолат на *S. pneumoniae* с потенциално значение, базирайки се на резултатите от анализа на урина, чистия растеж и на основните заболявания на пациента.

Introduction

Streptococcus pneumoniae leads to a wide spectrum of infections ranging from acute otitis media and pneumonia to severe invasive diseases, such as septicemia and meningitis. It is not a common agent of urinary tract infection (Kadioglu *et al*., 2008; Kline and Lewis, 2016; Balsells *et al*., 2017).

Here we present a case of *S. pneumoniae* urinary isolate at the Medical Microbiology Laboratory of University of Health Sciences, Dışkapı Yıldırım Beyazıt Training and Research Hospital. Although several documented cases of urinary tract infections due to *S. pneumoniae* are present in the literature, to the best of our knowledge, this is the second case report of urinary *S. pneumoniae* isolate in our country (Safak *et al*., 2014).

Case presentation

Patient KA, male, a 17 year-old refugee from Afghanistan, applied to the nephrology outpatient clinic with abnormal impairment of renal functions. His medical records were checked from the Hospital Information System, and relevant clinical details including laboratory parameters were noted. Unfortunately, due to missing records, a complete history of the patient could not be obtained. There are several outpatient applications of the patient to our hospital, including plastic surgery, neurosurgery and nephrology clinics. The patient was operated for meningomyelocele (operation date and place are unknown) and had chronic renal disease for seven years. He also has upper and lower limb spasticity, neurogenic bladder and does clean intermittent self-catheterisation due to urinary incontinence. At patient's admission to the nephrology outpatient clinic, routine biochemistry, urine analysis and microscopy, blood gas and urine culture were tested.

Results from laboratory tests of the patient revealed blood sugar of 100 mg/dL, abnormal renal function tests; with a creatinine level of 2.84 mg/dL (normal level, 0.84-1.25 mg/dL) and a blood urea nitrogen level of 105 mg/dL (normal level, 17-43 mg/dL). Venous blood gases showed acidosis (pH 7.27; pCO2, 46.8 mmHg; pO2, 20.8 mmHg).

His urine analysis revealed cloudy urine with increased leucocyte esterase and hemoglobin. Urine microscopy revealed 15/HPF erythrocytes, 120/HPF leucocytes with several clusters, and scattered bacteria, with kidney epithelium 6/HPF. Urine sample of 0.001 mL was inoculated on 5 % sheep blood agar (SBA) and Eosin Methylene Blue (EMB) agar (Becton Dickinson, USA). After 18-24 hours of incubation at 5% CO2 incubator, a pure growth of 100.000 cfu/mL faint alpha-hemolytic mucoid colonies were seen on sheep blood agar. The col-

onies were confirmed as *S. pneumoniae* based on colony morphology, Gram stain, alpha haemolysis, bile solubility and optochin susceptibility. The biochemical profiles generated by Phoenix 100 automated system (Becton Dickinson, USA) identified the isolate, also, as *S. pneumoniae*. Penicillin susceptibility was tested with oxacillin disc screen test, and interpreted according to European Committee on Antimicrobial Susceptibility Testing (EUCAST) criteria. The isolate was detected as susceptible to penicillin. Antimicrobial susceptibilities of vancomycin, co-trimoxazole, erythromycin, clindamycin, levofloxacin were detected also as susceptible by Phoenix 100. Acute phase reactants like sedimentation and CRP were not tested. No history of his medications was learned. Patient's blood and nasopharyngeal cultures were not performed.

Discussion

Urinary tract, due to urine flow, regular bladder emptying, and low pH, has its own clearance mechanisms, which are not convenient for growth of *S. pneumonia*. All the cases reported in the literature had a renal or urogenital structural or other abnormality as an accompanying factor. When isolated from urine, many of the authors had the tendency to accept *S. pneumoniae* as a periurethral contaminant (Krishna *et al*., 2012; Choi *et al*., 2013). Here in this case, although not fully proven as an agent of urinary tract infection, the growth of *S. pneumoniae* was considered as important, because of purity, colony count and confluence of growth. Although multidrug resistant *S. pneumoniae* are increasing, it is pleasing that we did not detect resistance in this isolate.

A literature search revealed only several *S. pneumoniae* urinary tract infection cases. In a research paper published in 2011 Burckhardt and Zimmermann reported three cases of *S. pneumoniae*, considered as agent of UTI in three children with UTI abnormalities, and a high number of growths with varying clinical symptoms. Choi *et al*. (2013) reported three cases of urinary tract infection due to *S. pneumoniae*, all three cases had underlying urinary tract abnormalities.

A case from Greece was reported from a 4 year-old child, which was considered to be perineal contamination, and taken into consideration because of symptoms (Meletis *et al.*, 2013). In their extensive study with 53,499 urine cultures, Miller and colleagues detected pneumococcusuria in 0.08% of the specimens. In 17.8% of these patients *S. pneumoniae* was isolated as pure culture, the others were considered as perineal contamination (Miller *et al.*, 1989). Krishna *et al.* (2012) presented six cases of pneumoccusuria (from 18 months to 69 years of age) during a time period from May 2008 to May 2010. All patients at their presentation had a co-existing predisposing factor with the isolation of *S. pneumoniae* in urine. Noble, 1985 presented a mild case of urethritis and urethral colonization of *S. pneumoniae* five days after orogenital sexual contact. As *S. pneumoniae* is not one of the residents of urethral flora, his partner's oral flora was suspected because of his history. In a retrospective study in 1988, *S. pneumoniae* was detected in 31 urine specimens, of these 11 were mixed with other bacteria, only two had more than 105 cfu/ml growth (Mark *et al.*, 2016).

Here in this case, although there are many missing points in the history of the patient, underlying disorders were easily understood from medical records and *S. pneumoniae* is thought to cause UTI through multiple factors of the host immune system and bacterial virulence.

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