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Case Report

Peritonitis by *Leclercia adecarboxylata* in a patient with continuous ambulatory peritoneal dialysis: the first case report from India

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ABSTRACT

Peritonitis is a major complication in patients on continuous ambulatory peritoneal dialysis (CAPD), which is increasingly being caused by rare, saprophytic microorganisms. We present a case having CAPD admitted in our hospital that came with complaint of pain abdomen and cloudy peritoneal effluent, from which pure culture of *Leclercia adecarboxylata* had been isolated *L. adecarboxylata* is a rarely reported gram negative human pathogen, very easily misdiagnosed as *Escherichia coli*.

Keywords: CAPD, Peritonitis, *Leclercia adecarboxylata*

INTRODUCTION

Peritonitis is a major complication in patients on peritoneal dialysis (PD) and is the primary reason why patients switch over from peritoneal dialysis to haemodialysis. In the United States it is a direct contributing factor to the death of 16% of PD patients.[1,2] The peritoneal fluid used in patients maintained on peritoneal dialysis contains both glucose and protein and therefore serves as an excellent culture medium for micro-organisms. In addition, patients with renal failure on dialysis have an altered immune status due to which organisms with low pathogenic potential are able to cause peritonitis. Recently, there are increasing reports of rare and unusual organisms causing peritonitis in patients maintained on peritoneal dialysis.3 We present here the first case report of continuous ambulatory peritoneal dialysis peritonitis caused by *Leclercia adecarboxylata* as the sole pathogen, from India.

CASE REPORT

A 38 years old woman, known case of dilated cardiomyopathy receiving CAPD for end stage renal disease since March 2010 presented in November, 2013 with turbid PD effluent, high grade fever, recurrent vomiting and dull aching pain in abdomen for 4 days. She was trained for continuous ambulatory peritoneal dialysis in a stable state of health. Even though the patient was compliant with medical care she had had three previous episodes of peritonitis all of which were managed successfully with antibiotics. The patient denied any contact with soil or plant material or any pet animals. She was admitted to the hospital as her abdominal pain worsened. On physical examination blood pressure was 100/70 mm Hg, temperature 101.8° F, pulse 78 and respiration rate 22. There was no clubbing, cyanosis, lymphadenopathy or icterus. Her lungs were clear and no cardiac murmur was heard. Her abdomen was tender in all quadrants with rebound tenderness. Bowel sounds were present and active.

Pertinent laboratory values were haemoglobin 0.3 gm/dL, WBCs 66,000/mm^3, serum creatinine 7.1mg/dl, serum BUN 38mg/dl, serum uric acid 6.5mg/dl, sodium 134 mmol/l, potassium 4.0 mmol/l, albumin 2.9 g/dl, serum bilirubin (total) 0.40 mg/dl, AST (SGOT) 15U/L, ALT (SGPT) 10U/L, alkaline phosphatase 102 U/L, amylase 29U/L. Peritoneal dialysis fluid was sent for cell count, gram staining and culture. Effluent analysis revealed a WBC count of 5800/mm^3 with 90% neutrophils. Gram stain of the fluid showed plenty of gram negative bacilli with pus cells. A presumptive diagnosis of CAPD peritonitis was made and empiric intra-peritoneal therapy with tobramycin 40mg and cefazolin 1gm was started. PD fluid culture yielded heavy growth of catalase positive, oxidase negative, lactose fermenting gram negative bacilli. A battery of tests were put up for identification and the characteristic reactions included, methyl red (positive), Voges-Proskauer (negative), indole production (positive), citrate (negative), DNase (negative), malonate utilization (positive),lysine decarboxylase (negative), ornithine decarboxylase (negative), arginine dihydrolase (negative), D-glucose (positive), D-mannitol fermentation (positive),hydrogen sulfide (negative), esculin hydrolysis (positive), nitrate reduction (positive), adonitol fermentation (positive), D-sorbitol fermentation (negative), inositol fermentation (negative). The isolate was identified as *Leclercia adecarboxylata*. The identity of the isolate was further confirmed by the biochemical profile obtained by BD Phoenix automated microbiology system (BD Diagnostic Systems, Sparks, MD). Antimicrobial susceptibility testing results showed the isolate to be sensitive only to amikacin, trimethoprim-sulfamethoxazole, tetracycline and meropenem. It was moderately sensitive to imipenem and resistant to cefazolin, ceftazidime, cefotaxime, cefoxitin, gentamicin, tobramycin, piperacillin-tazobactam, ticarcillin-clavulanic acid, ciprofloxacin and levofloxacin. The antibiotic treatment was changed to amikacin but the abdominal pain worsened and the patient did not respond even after five days of anti-microbial treatment. The peritoneal catheter therefore had to be eventually removed. The catheter tip also yielded growth of *Leclercia adecarboxylata*.

DISCUSSSION

Leclercia adecarboxylata is an ubiquitous, motile, gram-negative rod, previously designatedas *Escherichia adecarboxylat* or Enteric group 41.[4] *Escherichia adecarboxylata* was the name proposed by Leclerc in 1962 for a group of yellow pigmented organisms resembling *Escherichia coli*.[5] Reports on the isolation of this organism from human clinical samples are rare. It is possible that it is an under reported and under diagnosed opportunistic pathogen due to misdiagnosis as *Escherichia coli* with which it shares several biochemical characteristics.[4] We identified our isolate by a large array of biochemical tests and automated identification system. However, nucleic acid analysis, especially of 16s ribosomal DNA will more accurately identify such rare pathogens. *Leclercia adecarboxylata* is a part of normal flora in the gut of animals and its epidemiological significance is not clear though it has been recovered from cases of wound infection, bacteraemia, sputum samples, urinary tract infections, vaginal discharge.[6-8] Most recently it has been reported from India, as the cause of ventilator associated pneumonia and pharyngeal, peri-tonsillar abscess and in immune-competent patients.[9,10] It has most commonly been isolated from different infections as a part of mixed flora and most of the cases were immune-compromised, the clinical significance of which is not clear.[6,11] Few reports raised suspicion of association between *L. adecarboxylata* cutaneous infection and contaminated sea water especially in cases wound infection among healthy individuals.[12] Stock et al studied the natural antimicrobial susceptibility pattern of 101 strains and showed that all of them were naturally sensitive to all tested aminoglycosides.[13] Our isolate was however resistant to gentamicin and tobramycin but sensitive to amikacin. The dialysis-related infections update recommends an aminoglycoside or a third generation cephalosporin such as ceftazidime or cefepime or a carbapenem for gram negative coverage.[14] Quinolones should be used for empiric coverage only if local sensitivities support such use. Our case was clinically significant because the isolate was recovered in pure culture and was resistant to multiple antibiotics including two aminoglycosides and ceftazidime. Resistance and non-response to the recommended antimicrobial agents lead to the removal of the catheter. Mazzariol et al have reported isolation of *L. adecarboxylata* from blood culture producing an SHV-12 extended-spectrum beta-lactamase.[15] Another interesting characteristic of *L. adecarboxylata* is its natural resistance to fosfomycin and has been mentioned by Pe´rezMoreno et al and Rodrı´guez et al in their published case reports.[16,17] *Escherichia coli* is however naturally sensitive to this agent. This phenotypic parameter may allow reliable differentiation between the two organisms since they share several bio-chemical properties.

CONCLUSION

In conclusion, as per review of literature ours is the first case report from India, in English language literature of a pure culture from a case of CAPD peritonitis in an adult– without other coinciding pathogens. More studies and reports are needed to determine the true pathogenic potential of this organism.

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