



A CASE OF TUBERCULOMA BRAIN IN ASSOCIATION WITH CUPRIAVIDUS PAUCULUS INFECTION – OPPURTUNISTIC ENVIRONMENTAL PATHOGEN

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ABSTRACT Ralstonia paucula (previously classified as CDC (Centre for Disease Control) group Ivc-2, Wautersia paucula; newly retitled as Cupriavidus pauculus) is an environmental Gram-negative bacillus sequestered from water cradles and be able to origin grim human infections. Patients get well bacteriologically representing virulence on lower side. Many cases have been described worldwide but no sequestration has ever been stated from cerebrospinal fluid of adult patient having Tuberculoma in India. The first case of R. paucula meningitis from patient with Tuberculoma is being testified here alongside with the short summary of case.

KEYWORDS :

Introduction

This isolate Cupriavidus pauculus belongs to family of Burkholderiaceae is an environmental Gram-negative bacillus, which is able to root infrequently opportunistic pathogen particularly in major risk patients. Seclusion from a clinical sample is normally preserved with great index of disbelief and frequently considered as contamination without recognized else. It has been caught up in pseudo-outbursts,^[1,2,3] but might be measured a pathogen if secluded from a body fluid which are sterile in nature and associates with medical illness. We account hereby, the first case of Ralstonia paucula from cerebrospinal fluid (CSF) of adult having immunocompromised status in India.

Case Report

A 66 yrs old male patient visited to our institute in April with complaints of 2 seizure episodes and dysarthria 10-15 days back with reduced appatite. Relatives had given history of seizure on 5/04/22 and 9/04/22. There was no significant past medical history/allergic history. Patient was admitted under medicine department.

On examination his pulse was 78/min ,temp 96,blood pressure was 130/80, his R/R was 19/min, oxygen saturation was good. Pt was conscious oriented, nothing abnormal was detected in cardiovascular system, left side crepitations were present in lungs, Per abdomen was soft and non tender. MRI brain (plain plus contrast done outside) was suggestive of multiple nodular ring lesions in bilateral cerebral and cerebellar hemisphere with significant perilesional edema s/o infective aetiology tuberculoma or Neurocysticercosis. In light of the above findings a provisional diagnosis of Tuberculoma/NCC was made and treatment was initiated Inj Levipil 500 mg IV BD.

Investigations revealed normal CBC,LFT,KFT and raised C-reactive protein; blood sugar were normal. Patient was seronegative. Lumber puncture was done and CSF was sent for routine microscopy ,gram stain, ZN stain, gene expert and culture sensitivity. CSF cell count was 100% for lymphocyte . Gram stain of centrifuged CSF deposit showed pus cells with faint staining Gram-negative bacilli. CSF culture presented clean pure growth of Gram-negative organisms (>10⁵ CFU/ml) after an overnight incubation at 37°C on blood agar, chocolate agar and MacConkey agar. Growth was processed further . The colonies were non haemolytic, non-lactose fermenter,opaque non-pigmented 1-2 mm size and easily emulsifiable. catalase and oxidase positive, the bacilli were actively motile; hence tentatively identified as Pseudomonas spp. Conventional biochemical reactions presented positive results for urease, citrate production and nitrate reduction while indole test was negative, triple sugar iron agar showed k/k reaction with no gas formation and no H₂S production. Growth was simultaneously subjected to Gram-negative panel on BD Phoenix for identification and antimicrobial susceptibility testing. The isolate was identified as Cupriavidus pauculus with 99.99% confidence value. At the same time CSF was also inoculated in blood culture bottle and kept for incubation in Bactec which alarmed positive within 48 hrs which was further processed and yielded same pure growth of Cupriavidus pauculus. The panels were read manually also and compared with

biochemical reactions mentioned.^[3] However we couldn't do Molecular analysis of the isolate. The isolates were susceptible to Amikacin, Gentamicin, ceftazidime, ceftriaxone, cefepime, ciprofloxacin, levofloxacin, amoxicillin/ clavulanic acid, cefosulbactam edta disc, piperacillin/tazobactam, imipenem and meropenem; resistant to co-trimoxazole, aztreonam (determined by Minimum inhibitory concentration in ug/ml). His HRCT showed a well defined large isodense lesion with slightly speculated margins involving posterior segment of left lower lobe lung with morphology and extent as described suggestive of infective granulomatous etiology lesion, however possibility of neoplastic etiology need to be in consideration. Patient was started on AKT therapy and steroids in view of Tuberculoma. He was advised PET CT scan and sos lung biopsy or bronchoscopy on discharge.

Discussion

In history, C. pauculus has infrequently been identified in human infections. Stovall et al. documented the first known evidence of hospital acquired infection with C. pauculus accountable to infection from Extra Corporeal Membrane Oxygenation (ECMO) equipment.⁴ Further on are environmental pathogen which might be originate in soil, on plants or water. It has been caught up in false -occurrences of dermal and superficial site illnesses⁵. Freshly Tasbakan et al. recounted a case of C. pauculus ventilator related pneumonia in a 47 years-old female with breast cancer.⁶ S Duggal et al has reported a case report of septicemia and meningitis caused due to Cupriavidus pauculus.⁷ This patient was admitted under medicine with tuberculosis or neurocysticercosis. To our understanding, this is the first case of tuberculoma associated with Cupriavidus pauculus in a adult patient who was immunocompromised.

Hospital acquired transmission is ruled out in this case as patient was having seizure with fever.⁷ Contagion in laboratory is also not possible since both manual as well as automated system has grown C. pauculus. CSF were acknowledged in sterile containers; gram stain of CSF was expressive of bacterial infection, CSF count of this organism was high and Pauculus was not grown from any other specimens⁸. Infection appears to be acquired from either community or through nasopharyngeal route. Ralstonia paucula belongs to genus 'Ralstonia', named in esteem of an American bacteriologist; E. Ralston and species 'paucula' to specify that these strains only seldom source of human diseases. In the beginning it was recognized as CDC group IV c-2 organism.^[9] Well ahead genus Wautersia was announced to include species of Ralstonia, which non fermenter of carbohydrate, motile by peritrichous flagella. Nonetheless , it was lastly been positioned in the genus Cupriavidus, species pauculus.

In this case, positive direct smear, concomitantly positive CSF cultures have supported its role as a pathogen. Patient was effectively treated anti KOCHS AKT-4 and third generation cephalosporin to which it was sensitive and other medical management tab levipil, tab dexton, tab pan and tab beadon. Although authenticated approaches of antimicrobial susceptibility test and treatment guidelines are not available for Cupriavidus, effects of antibiotics were concluded depending on lowermost MIC values displaying no growth. Case

reports on this organism are inadequate, comprising cases of tenosynovitis septicemia, peritonitis, pneumonia. This organism has on no occasion been involved as a contributory agent of meningitis in adults with features suggestive of Tuberculoma and immunocomprised state before. Furthermore, this is the first case commenting its isolation in India . Present case spotlights the fact that these organisms be able to origin community acquired infections, which may be entirely treated if identified correctly. Consequently, primary exertion should be to stop extent of these organisms.

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