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# Multiple Organ Dysfunction Syndrome in an Immunocompetent Individual due to Burkholderia cepacia pneumonia: An Unusual Case.

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**Abstract**
*Burkholderia cepacia is a group of highly virulent organisms known as Burkholderia cepacia complex (Bcc). Bcc are ubiquitous and most commonly found in moist places, on plant roots and soil. Because of its high intrinsic resistance to antibiotics, Bcc is a major cause of morbidity and mortality in hospitalized patients.Usualy, It is reported in immunocompromised patients especially in patients with cystic fibrosis. Here, we report a rare case report of pneumonia by Burkholderia cepacia in an immunocompetent patient, who presented with fever and Multiple Organ Dysfunction Syndrome (MODS). Burkholderia cepacia was isolated from his sputum culture.*

**Case Report**

A 63-year-old male, was brought to the emergency of our hospital in march 2018 with complaint of high fever with chills and rigor, with cough and expectoration for 6-8 days. The patient was complaining of jaundice as well. There was no past history of any diabetes, hypertension, old koch's. Patient was febrile and icteric on examination. Pulse rate was 108 beats per minute, low volume, thready, with no radio-radial or radio-femoral delay. Blood pressure was 74/48 mmHg. Respiratory rate was 18 breaths per minute. His lab parameters were-Hb 7.8 gram %. His Total Leukocyte Count (TLC) was 39,100/mm3 with neutrophil count 86%, lymphocyte count 11% and eosinophil count 3%. Blood urea level was 191.9 mg/dl and serum creatinine was 4.2 mg/dl. Sputum for AFB were negative two times. Other investigations showed deranged LFT's as total bilirubin was 12.1 mg/ dl with direct bilirubin 9.4 mg/dl and indirect bilirubin 2.7 mg/dl. Level of Alanine Aminotransferase (ALT) was 57 IU/l, Aspartate Aminotransferase (AST) was 43.0 IU/ l and Alkaline Phosphatase (ALP) level was 87.0 IU/ l. Total protein was 4.2 g/dl with albumin 1.7 g/dl and globulin 2.5 g/dl. INR was 1.9. Serum electrolytes were normal. The patient was negative for Hepatitis C, Hepatitis B and HIV. Microbiological tests for malaria and typhoid were also negative. Ultrasonography showed, mild liver enlargement. Plain chest X-ray showed

consolidation in right upper lobe[figure1]. Chest CT scan were done with contrast which showed consolidation with infiltration in right upper lobe with nodulo-infiltrative lesions[figure2]. Two sets of sputum samples were cultured. The isolate was identified as Burkholderia cepacia complex on culture reports. Antibiotic culture-sensitivity was done. The isolate was susceptible to ciprofloxacin, levofloxacin, imipenem and meropenem. The patient was treated with broad spectrum injectable cephalosporin, cefepime and clindamycin initially as empirical therapy. It was changed to ciprofloxacin after sensitivity results were available. Intravenous fluids and nor-adrenaline infusion was given to correct low blood pressure. Vitamin K was also given to correct coagulopathy. The patient recovered within 15 days. All lab parameters were normal at the time of discharge. The patient was discharged in satisfactory condition with stable vitals.

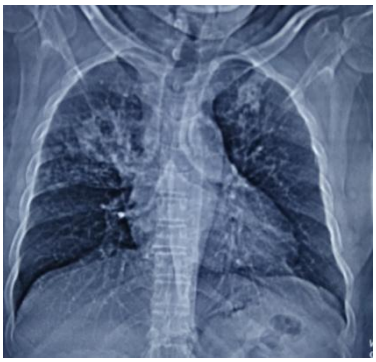

**Figure1:** chest xray showing consolidation in right upper lobe.

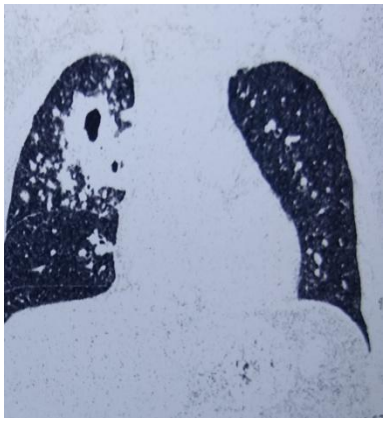

**Figure2:** ct chest showing right upper lobe consolidation and nodulo- infiltrative lesions.

**Discussion**

Burkholderia cepacia are complex organisms which are ubiquitous. They are found in moist environment, animal left-overs. Its named after, William Burkholder, who described it first[1]. Bcc constitute a group of highly virulent organisms. Bcc is intrinsically resistant to many commonly used antibiotics, such as, antipseudomonal penicillins (ticarcillin, piperacillin, and carbenicillin), aminoglycosides (amikacin), first and second generations of cephalosporins and polymixins[1]. These antibiotics are used for Pseudomonas infections and so the proper differentiation of Bcc from Pseudomonas is very important. Mechanisms causing resistance include efflux pumps, bacteria also produce beta lactamases and other modifying enzymes, as well as modification of antibiotic targets[2]. The organism is also related to Cepacia Syndrome which cause prolonged temperatures and a terminal disease[3]. Pathogenesis is because of the flagellin glycosylation system in Burkholderia cenocepacia which evades human innate immune responses. Flagella helps bacteria in making biofilm, as well as helps to adhere and invade epithelial cells. Flagellin protein interacts with Toll-Like Receptor 5 (TLR5) which causes epithelial inflammatory responses in lung tissues[4]. Burkholderia cepacia usually does not cause diseases in immunocompetant hosts. Mostly it has been reported in patients suffering from cystic fibrosis. These bacteria frequently cause fatal infections in vulnerable humans, such as those who have diabetes, chronic alcoholics, or patients with destroed lungs due to other causes like cystic fibrosis.

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**Conclusion**

We conclude that correct differentiation of Burkholderia cepacia from pseudomonas should be done for proper administration of treatment as they are intrinsically resistant to many antibiotics.

Burkholderia cepacia can cause infection in immunocompetent individuals also and it can present without pneumonia or chest complains as MODS.

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