

RESEARCH ARTICLE

Isolation and Characterization of *Burkholderia cepacia* from Respiratory Infections

*Rima Hasan¹

¹Department of Community Health, Technical Institute Samawa, Iraq

*Correspondence: rimahasan2016@gmail.com

Abstract

Present study aimed to study prevalence of *B. cepacia* in respiratory infection patients, 50 sputum samples were collected from respiratory infection patients were admitted to Al-Hussein training hospital, cultured specimen directly on blood agar then sub cultured on MacConkey agar, bacteria tested biochemically and with antibiotic sensitive test. Results showed 4 samples positive for culture with *B. cepacia* also isolates showed sensitive for cefataxime 100% and resistant 100% for tetracycline.

Keywords: *B. cepacia*, Cefataxime, Tetracycline. Respiratory Infection, Sputum

Introduction

Burkholderia cepacia demonstrates significant nutritional changeability. Various micro-organisms have an inherent or attained capability to decrease antibiotics, but less are capable to use penicillin as the only carbon source (Beckman and Lessie, 1979).

The public features of *B. cepacia* are gram-negative, non-spore forming, aerobic bacillus, motile with a respiratory metabolism as well as catalase and oxidase-positive. Numerous non-fluorescent pigments are also created and poly-phydroxyalkanoates collected as reserve supplies. The optimal temperature to grow is 30- 35°C (Palleroni and Genus, 1984). Recent molecular analyses has exhibited scientific indication that may consider for the organism's impressive changeability that is multi-locus linkage disequilibrium analysis. Compare to environmental populations (Wise et al, 1995) that were proposed for this study have an extremely increased level of recombination in *B. cepacia* comparative to binary fission, showing of a various

replicons and insertion sequences in type strains (Cheng and Lessie, 1995; Holmes, 1986).

The ordinary habitats of *B. cepacia* is soil, water and vegetation (Pitchford, 1987). Anyway, it is a public but imprecise confidence show that *B. cepacia* is a universal saprophyte that have same habitats as *Pseudomonas aeruginosa*. Common subsequent researches explained that culture of *B. cepacia* additional to plants, from hospitals, food stores, restaurant salad bars and patient's homes are more serious, with recognition rates of 1-16% (Holmes; Shaw et al, 1995).

Prior to 1980s, information of human infections triggered by *B. cepacia* were sporadic and usually limited to hospitalized patients visible to contaminated disinfectant and anesthetic solutions that this nutritionally adaptable saprophyte lasts for elongated times. Infections that affect soft tissues and the respiratory and urinary tracts, but bacteremia may exist occasionally, related with endocarditis and septic shock (Miller, 1995; Vandamme et al, 2003).

Materials and Methods

For this study 50 sputum samples were taken from respiratory distress patients admitted at Al-Hussein Teaching Hospital in Samawa city, Iraq. Clinical signs of respiratory infections for patients were recorded by physician. No invasive sampling method was applied.

For specific isolation of *B. cepacia*, sputum specimens were cultured on blood agar then incubated at 37°C for 24 hrs, then purified by subcultures on MacConkey agar. The identification tests for the isolates, including cultural, morphological, and biochemical characteristics was done for each isolate then confirmation by API-20 kit (biomerienx, France), vital system (biomerienx, France) suspected colonies of *B. cepacia* were confirmed using slide agglutination test with *B. cepacia* antiserum (Remel / USA).

Isolates were tested for susceptibility to nine different antibiotic agent including Cloramphenicol, Penicillin, Tetracycline, Ciprofloxacin, Trimethoprim, Amoxiclave, and Cefotaxime. The disc diffusion of these antibiotic agents were determined by standard method which recommended in the national committee for clinical of laboratory standards (NCCLS).



Figure 1: Growth of *B. cepacia* on Blood agar showed hemolysis.



Figure 2: Growth of *B. cepacia* on MacConkey agar showed non lactose fermenter.

Table 1: Sensitivity and Resistance Rate of Different Antibiotics

Antibiotic	Sensitive %	Resistance %
Penicillin G	1(25%)	3(75%)
Ampicillin	1(25%)	3(75%)
Amoxicillin	2(50%)	2(50%)
Amoxiclave	3(75%)	1(25%)
Cefotaxime	4(100%)	0
Chloramphenicol	2(50%)	2(50%)
Trimethoprim	3(75%)	1(25%)
Ciprofloxacin	2(50%)	2(50%)
Tetracycline	0	4(100%)

Results

Four samples (8%) were positive for *B. cepacia* when cultured on MacConkey agar where lactose non fermenter on MacConkey agar with Smooth and round colonies. *B. cepacia* were positive for oxidase and catalase, all strains were motile as well as were hemolysed on blood agar, and also all infected persons were suffered from massive inflammatory pneumonia.

Antibiotic sensitivity and resistance rate for 4 isolates of *B. cepacia* to 9 different antibiotics were used in our study are shown in table 1.

Discussions

B. cepacia is an opportunists pathogen in immunocompromised patients particularly individuals with chronic granulomatous disease and cystic fibrosis (De Soyza and Corris, 2003). From results

showed bacterium is motile and oxidase positive. Antibiotic susceptibility of *B. cepacia* isolates to 9 antibiotic agents as in table 1. The isolates are high resistance to β -lactam antibiotics, excluding cefotaxime and amoxiclavate, penicillin G, ampicillin, amoxicillin and ciprofloxacin, chloramphenicol, trimethoprim and tetracycline.

The clinical observation study were same as mentioned concerning about the appearance of this opportunistic pathogen among patients due to increase isolation since the late 1970s, its role in damaging lung function and its innate multi-antibiotic resistance, thus it is important to employ reliable diagnostic techniques for this organism.

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