

Survey of Microbial Prevalence and Antibiotic Resistance in Cystic Fibrosis Patients in Tehran

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Background & Objectives: Cystic fibrosis is the most common lethal genetic disease in white populations. Cystic fibrosis is caused by a mutation in a gene that encodes cystic fibrosis transmembrane conductance regulator (CFTR) protein, which is expressed in many epithelial cells and blood cells. Respiratory tract of Cystic fibrosis patients can be described as natural environments harbouring persisting microbes such as *Pseudomonas aeruginosa*, *Burkholderia cepacia*, *Achromobacter xylosoxidans*, and *Stenotrophomonas maltophilia*, *S. aureus*, *Streptococcus pneumoniae* and *Haemophilus influenzae*. Without antibiotic treatment the patients with CF are at risk of early infection and inflammation becoming established and ultimately progressing to fatal respiratory failure. The goal of this study was to examine the current microbiology and susceptibility of organisms isolated from Cystic fibrosis patients.

Methods: Sputum samples cultured on Blood agar, *B. cepacia* selective agar (BCSA), MacConkey's Agar, Ceftrimide agar and Chocolate agar. Isolates were detected by conventional microbial methods. Then antibiotic susceptibility of isolates was detected by Kirby-Bauer disk diffusion methods and serial microdilution (MIC) methods.

Results: In this study 24 sputum samples of cystic fibrosis patients were examined. 18 patients were infected with bacteria as *Enterococcus faecium* (n=1), *Enterobacter agglomerans* (n=1), *Enterobacter cloacae* (n=2), *E. coli* (n=2), *Pseudomonas aeruginosa* (n=1), *Acinetobacter johnsonii* (n=1), *Acinetobacter lwoffii* (n=1), *Acinetobacter baumannii* (n=1), *Staphylococcus aureus* (n=1), *Staphylococcus lugdunensis* (n=1), *Staphylococcus schleiferi* (n=1), *Stenotrophomonas maltophilia* (n=1), *Klebsiella pneumoniae* (n=2), *Moraxella osloensis* (n=1), *Moraxella atlantae* (n=1). In some patients more than one bacteria were isolated. *E. faecium* is the most resistant to all groups of antibiotics. The most antibiotic resistance is related to cephalosporins, Penicillin and Nitrofurantoin and the least of antibiotic resistance is related to meropenem and imipenem.

Conclusion: Our study showed that cystic fibrosis patients in Tehran are subject to various bacteria of gram-positive and gram-negative. Current antibiotics are not useful in eradication of bacteria involved in cystic fibrosis patients, so usage of newer antibiotics or other techniques are essential.

Keywords: Microbial Prevalence; Antibiotic Resistance; Cystic Fibrosis