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Original Article

Isolation, Characterization and *in vitro* Evaluation of Specific Bacteriophages Targeting Extensive Drug Resistance Strains of *Pseudomonas aeruginosa* Isolated from Septic Burn Wounds

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No conflict of interest.

ABSTRACT

Background: Antibiotic resistant bacteria and various infections caused by them especially extensive drug resistance (XDR) strains and worrying statistics of mortality due to these strains and also the lack of a clear vision for development and production of new effective antibiotics have made the necessity of using alternative therapies more apparent.
Materials and Methods: In this study, specific phages affecting the *Pseudomonas aeruginosa* XDR strain were extracted from hospital wastewater and their laboratory characteristics along with lysis effect on 40 XDR strains of *P. aeruginosa* were investigated.
Results: The results indicated that three isolated phages (PaB1, PaBa2 and PaBa3) belonged to the *Myoviridae* and *Pododoviridae* families and were specific to *Pseudomonas aeruginosa* strains. More than 98% of phages absorbed their host in less than 10 minutes (Adsorption time <10 min) and completed their lytic cycle after 40 minutes (latent time = 40 min). Burst size of PaBa1, PaBa2 and PaBa3 was 240, 250 and 220 pfu/cell, respectively. PaBa1 lysed 62.5% of the XDR strains with the highest efficiency. The three Phage cocktail was effective against 67.5% of the studied strains.
Conclusion: The results of this study indicate the significant potential of these phages for therapeutic use and prophylaxis of infections caused by this bacterium.

Keywords: Bacteriophage; *Pseudomonas aeruginosa*; Drug resistance; Antibiotic resistance

INTRODUCTION

Pseudomonas aeruginosa as an opportunistic bacterium can cause serious infections in people with deficient immune systems. This group of patients includes people with severe burn wounds, patients with cystic fibrosis, cancer patients and patients suffering from acquired immunodeficiency syndrome [1-3]. Various studies have reported a significant prevalence of