Session ORAL SESSION 38 - Hot Topics in Infectious Diseases

373 - Bacteriophage Treatment in a Lung Transplant Recipient

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Authors

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Disclosures

S. Aslam: None. **G. Yung:** None. **J. Dan:** None. **S. Reed:** None. **M. LeFebvre:** None. **C. Logan:** None. **R. Taplitz:** None. **N. Law:** None. **E. Golts:** None. **K. Afshar:** None. **S. Lehman:** Employee; Current/Ongoing - Payment Made to Me; Amplihi Biosciences. **S. Morales:** Employee; Current/Ongoing - Payment Made to Me; AmpliPhi Biosciences Corporation. **C. Furr:** Employee; Current/Ongoing - Payment Made to Me; AmpliPhi Biosciences Corporation. **F. Rosas:** Employee; Current/Ongoing - Payment Made to Me; AmpliPhi Biosciences Corporation. **A. Gaidamaka:** Employee; Current/Ongoing - Payment Made to Me; AmpliPhi Biosciences Corporation. **I. Bilinsky:** Employee; Current/Ongoing - Payment Made to Me; AmpliPhi Biosciences Corporation. **P. Grint:** Employee; Current/Ongoing - Payment Made to Me; Ampliphi Biosciences Corporation. **B. Biswas:** None. **C. Duplessis:** None. **T. Hamilton:** None. **R. Schooley:** None.

Abstract

Purpose: We describe the case of a 67-year old male bilateral lung transplant recipient (LTR) who developed recurrent episodes of multi-drug resistant (MDR) ***Pseudomonas aeruginosa*** (PA) pneumonia in the setting of right anastomotic stricture requiring airway stent placement and chronic lung allograft dysfunction. We obtained an emergency Investigational New Drug approval from the US Food and Drug Administration to use sequential bacteriophage combinations (BC) as adjunctive treatment to systemic antibiotics.

Methods: Lytic bacteriophages that were active against the patient's PA strains were isolated from environmental samples and purified by ion exchange chromatography and tangential flow filtration. Serial respiratory PA isolates were monitored for susceptibility to BC and new BC were developed as bacteriophage-resistant PA emerged. BC used: AB-PA01 (4 phages), AB-PA01m1 (5 phages) - AmpliPhi Biosciences Corporation (San Diego, CA) and PA Navy Phage Cocktail 1 (3 phages), PA Navy Phage Cocktail 2 (2 phages) - Naval Medical Research Center (Fort Detrick, Maryland).

Results: BC given via intravenous (IV) and inhaled routes was well tolerated without any adverse events. We noted that BC given IV alone reached similar pulmonary concentrations as achieved with inhaled therapy alone. Pulmonary concentration of BC was higher than the given dose and indicative of bacteriophage replication in the lung. A shift in the antibiotic sensitivity patterns of PA was noted with BC treatment. We observed an increase in highly activated T follicular helper cells, plasma cells, and development of bacteriophage-specific CD4+ T cells during the course of treatment.

The patient clinically responded to bacteriophage and antibiotic therapy with resolution of pneumonia and improved respiratory status. During the next few weeks he developed a recurrent episode of PA pneumonia that resolved with bacteriophage and systemic antibiotics.

Conclusion: We describe the first report of bacteriophage therapy in a LTR. Given the concern for MDR PA in the lung transplant setting, we believe that bacteriophage therapy offers a viable adjunct to antibiotic therapy especially in the current era of increasing antimicrobial resistance and few novel antimicrobial agents in the development pipeline.