Summary

Antibiotic resistance is a major barrier to successful treatment of infections caused by *Pseudomonas aeruginosa.* Additional and novel measures to control this pathogen are needed, along with contemporary information about antibiotic resistances that are present in isolates from different environments. In the present study 72 (54%) from blood, 43 (32%) from sputum, and 19 (14%) from of tracheal aspirates from patients suffering from chronic and acute lung infections admitted to a local hospital in Lahore. Susceptibility of 134 isolates of *P. aeruginosa* was tested against selected antibiotics Meropenem, Imipenem, Piperacillin, Amoxicillin, Amikacin, Gentamicin, Tobramycin, Kanamycin, Clarithromycin, Clarithromycin, Cefepime, Cefixime, Levofloxacin, and Ciprofloxacin, *Lactobacillus* strains and copper, ferric and zinc metal nanoparticles were conducted. *P. aeruginosa* isolates showed *in vitro* resistant to many available antibiotics and among these Meropenem, Piperacillin, and Amoxicillin were with greatest susceptibility.

A significant inhibition of these resistant *P. aeruginosa* strains by *Lactobacillus* spp. was also observed in this study. *Lactobacillus* spp. with antagonistic activity or the products they produce metabolically which destroy or inhibit the spoilage causing and pathogenic bacteria so can be used effectively for various treatments. These lactic acid bacteria (LAB) produced bacteriocin antagonistic compounds along with the production of organic acids and hydrogen peroxide which inhibited the growth of other bacteria. The supernates of *Lactobacillus* spp. showed significant results in standard growth curve of *P. aeruginosa.* These LAB bacteria can be used alternative to antibiotic as are considered to be safe and provide substantial health benefits to man.

The anti-bacterial activity of silver, zinc and ferric oxide NPs were also showed significant results against *P. aeruginosa* isolates. This study may help in the development of chemotherapeutic methods against multidrug resistant bacterial pathogens and also for the identification of virulence factors and genes involve in chronic and acute lung infections. It provides a practical approach towards the use of nanoparticles to enhance antimicrobial activity against this pathogen