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Ingested probiotics reduce exacerbations in *Pseudomonas aeruginosa* and *Staphylococcus aureus* pulmonary infections

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Staphylococcus aureus and *Pseudomonas aeruginosa* are largely the cause of morbidity and mortality in both hospital and community settings. These pathogens remain the important cause of pulmonary infections in patients with cystic fibrosis with a worldwide prevalence. Although, antibiotics are efficient measures of treating bacterial lung infections, the occurrence of antibiotic resistant bacteria has been encouraging the researchers to explore novel therapeutic approaches. It has been discovered that certain lactic acid bacteria possess protective effects against bacterial and viral respiratory infections. The aim of present study was to investigate the capability of orally administered probiotics, *L. acidophilus*, to ameliorate *S. aureus* and *P. aeruginosa* pulmonary infections. Animals were exposed to aerosol of pathogenic suspension. After 24 hours of infection, *L. acidophilus* treatment was administered orally for 7 consecutive days. Evaluation of tissue bacteriology, histopathology and serum cytokines was performed. In parallel, human alveolar A549 cells were utilized to determine possible role of probiotic on pulmonary infections. Oral administration of *L. acidophilus* significantly ($P<0.05$) alleviate lung bacterial load and severity of infection as depicted by our histopathological studies. Results obtained from cytokinomics revealed that pro-inflammatory cytokines induced due to lung infection were suppressed in oral probiotic treatment groups. In addition, treatment with *L. acidophilus* induced murine lung anti-inflammatory, IL-10 cytokine level. Current work suggests that orally administered *L. acidophilus* in mice is able to attenuate *S. aureus* and *P. aeruginosa* induced lung cytotoxicity by modulation of host immune response.

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