



## Research Highlight

# EVALUATION OF ADHERENCE AND INVASION CAPACITY OF PNEUMOCOCCAL SEROTYPES

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Bacteria Pneumococci scientifically known as *Streptococcus pneumoniae* is a gram-positive bacterium which belongs to the family Streptococcaceae<sup>1</sup>. This bacterium does not produce spores and is commonly found in pairs known as diplococci.

This pathogen is often referred to as human lung pathogen because it resides in the respiratory tract of human beings<sup>2</sup>. *Streptococcus pneumoniae* adheres to the epithelial cells of lungs and start colonization and then invades the cells successfully.

At the colonizing sites, a bacterium multiplies without showing any symptoms and has a commensal relationship with the host. Afterward, they get penetrated and expand the area of infection in respiratory lining cells and cause diseases<sup>3</sup>.

In the progressive infection, pathological complications are caused because of the host inflammatory response to the bacterial extra- and intra-cellular components including pneumolysin (Ply), an intra-cytoplasmic toxin, which is released upon cell wall lysis<sup>4</sup>.

Accordingly, scientists conducted a new research in order to assess the adherence and invasion capability of clinically significant

pneumococcal serotypes at different levels during the bacterial exponential growth; early-, mid- and late-log phases, to human respiratory epithelial cells<sup>5</sup>.

For this purpose, the research team used 4 clinical isolates of diverse serotypes. Afterward, genetic accordance of the isolates was evaluated through Pulsed-field gel electrophoresis (PFGE). Bacterial pellets were then thawed at room temperature and resuspended in RPMI 1640 supplemented with 2% Fetal Bovine Serum (FBS). For statistical analyses, SPSS 11 of Mann Whitney's test was employed to compare two groups and Kruskal-Wallis's test for comparison of more than two groups<sup>5</sup>.

At the end of this experiment, it was revealed that the adherence capacity of tested serotypes differs among the different isolates at all growth phases. Moreover, bacterial adherence also gets amplified after longer exposure to the host cells. However, no bacterial invasion was noticed at 1-hour post-incubation. But, at 3 hours post-incubation, some bacteria were found to penetrate the host cells although the bacterial cfu (colony forming unit) numbers were statistically

### Key words:

*Streptococcus pneumoniae*

lung epithelial cells adherence capacity

pathological complications

bacterial cfu bacterial invasion

inadequate for examination. Further studies are required to verify these observations.

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