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**Pneumococcal Virulence Genes Expression In Representative Isolates Of Penicillin Susceptible S. Pneumoniae (PSSP) And Penicillin Non-Susceptible S. Pneumoniae (PNSP) of Medically Important Serotypes**

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**ABSTRACT**

Streptococcus pneumoniae can cause pneumococcal diseases especially among young children, the elderly and patients with immunosuppressive illness. The 90 serotypes of S. pneumoniae differ in virulence, geographical distribution and extent of drug resistance. There is a potential correlation between penicillin susceptibility pattern and functionality of the pneumococcal surface virulence proteins. This is because resistance mechanism occurs in the cell wall while the virulence proteins are also anchored here. In this study, expression pattern of cbpA, cbpG, psaA, pavA and pspA genes that encode for pneumococcal associated-virulence proteins in the cell wall and important in promoting pneumococcal carriage or disease were examined. Six S. pneumoniae isolates of medically important serotypes (6A, 19F and 23F) were chosen to represent Penicillin Susceptible S. pneumoniae (PSSP) and Penicillin Non-susceptible S. pneumoniae (PNSP). Expression of the genes in Todd Hewitt Broth (THB) with 0.5% yeast extract (control medium) as well as in presence of 2% Fetal Bovine Serum (FBS) (treated medium) was analyzed using relative quantification real-time PCR from two independent experiments. Gene expressions data was analyzed using Kruskal-Wallis test computed in Statistical Package for the Social Sciences (SPSS). The cbpA and cbpG genes were frequently up-regulated at a variable degree as compared to other genes in most isolates especially PSSPs. The most frequently down-regulated gene was psaA where only 1 isolate of PSSP serotype 19F showed up-regulation, followed by pavA and pspA. Based on the genes expression analysis, pneumococcal proteins may be differentially expressed by different pneumococcal serotypes and potentially strain specific properties. Choline binding protein A has been known as an important pneumococcal virulence factor. Interestingly a high expression of cbpA was observed in all three PSSPs agreeing with the hypothesis that there is a potential correlation between penicillin susceptibility pattern and functionality of the pneumococcal surface virulence proteins. This warrant a wider study to examine the effect of penicillin resistance in relation to virulence gene expression.