Jack Vojak, J Infect Dis Ther 2018, Volume 6
DOI: 10.4172/2332-0877-C1-039

The influence of mucus on *Streptococcus pneumoniae* and how this impacts bacterial colonisation of the human nasopharynx

Jack Vojak
Liverpool University School of Medicine, UK

Morbidity and mortality caused by *Streptococcus pneumoniae* is a global issue affecting all age groups from every walk of life. Disproportionately high levels of pneumococcal disease are associated with abnormalities of nasopharyngeal mucus production. Additionally, an association between viral co-infection and increased pneumococcal pathogenicity has been observed. Pneumococcal disease requires the bacterial colonisation of the human nasopharynx; without which colonisation and disease cannot occur. Despite this, colonisation does not inevitably result in disease. In order to understand why this may be, it is essential to understand the roles of immune factors at the epithelial barrier with regards to colonisation and how this progresses to invasive disease. Using an experimental human pneumococcal carriage model, colonisation in the nasopharynx of human volunteers was studied to elucidate the dynamic relationship between pneumococcus and the immune responses present at the epithelial barrier. To achieve this, quantification of MUC5AC, a key glycoprotein found in the mucus of the nasopharynx, was performed. This was done in the presence of attenuated viral co-infection in participants who were carriage positive or negative for pneumococcus. Additionally, the direct killing effect of secretory mucus was measured on pneumococcal colonies. Finally, we assessed the impact of secretory mucus on pneumococcal adherence to a living population of cells. We found there no killing effect of mucus on pneumococcus ($p=0.20$) and instead found the mucus to significantly increase bacterial replication. Secretory mucus was also found to possess barrier properties. These properties significantly reduced the proportion of pneumococcus in an environment from adhering to a living cell layer ($P<0.001$). Finally, our study indicated no relationship between raised MUC5AC levels and pneumococcal carriage with attenuated viral co-infection ($P>0.05$). Mucins role in pneumococcal colonisation is not yet well characterized. The study concluded that further investigation into the effect of mucus will be vital in fully understanding the immunological processes at play. Only then therapies can better target invasive pneumococcal disease and reduce the impact of this globally significant pathogen.

Biography

Jack Vojak is medical student pursuing his final year in medical school at University of Liverpool. He completed his MSc at Liverpool School of Tropical Medicine where he studied biology and control of parasites and disease vectors. During his time at the school, he undertook research into the host pathogen relationship between the infectious bacterial pathogen *Streptococcus pneumoniae* and the human nasopharynx.

hljvojak@liv.ac.uk

Notes: