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Paper Poster Session

Influenza - clinical epidemiology

Clinical significance of *Streptococcus pneumoniae* co-infection during respiratory syncytial virus infections in young children

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Background: Respiratory syncytial virus (RSV) is the most significant cause of acute respiratory infection (ARI) in children. The opportunistic pathogen *Streptococcus pneumoniae* is commonly detected during RSV infection; however the clinical significance of such bacterial co-infection is currently unclear.

Material/methods: The role of RSV and *S. pneumoniae* co-infection was investigated in children under 2 years presenting with ARI at the emergency department of the Royal Children's Hospital in Brisbane, Australia. Disease severity scores were assigned, and nasopharyngeal samples were screened for respiratory pathogens by quantitative PCR.

Results: RSV was detected in 50% of the 58 infants with viral ARI. *S. pneumoniae* was more frequently detected in RSV infections (64%) compared to other viral infections (46%) and was associated with RSV infection after adjustment for confounding factors (adjusted odds ratio: 4.09; 95% confidence interval: 0.95-17.62). Furthermore, infants with RSV and *S. pneumoniae* co-infections had significantly higher severity scores compared to those with other respiratory viruses and bacteria ($p=0.03$), with increased wheezing a contributing factor. Clinical isolates of these pathogens will be used in an epithelial cell culture model of co-infection, to investigate interactions between RSV, *S. pneumoniae* and the host immune system.

Conclusions: These results suggest that RSV and *S. pneumoniae* may together enhance disease severity during paediatric ARI. Understanding the role of *S. pneumoniae* during RSV infections is necessary to ensure the effective treatment of paediatric ARI.