Detection and Serotyping of *Streptococcus Pneumoniae* Colonizing Nasopharyx of Egyptian Children

Thesis

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Summary and Conclusion

Pneumococcal infection refers to an infection caused by *Streptococcus pneumoniae* (the pneumococcus). It is a major cause of pneumonia, meningitis, bacteremia, sinusitis, and otitis media, and it occasionally infects tissues at other sites.

The World Health Organization estimates that ١.٦ million people, including up to ١ million children aged <٥ years, die of IPD every year with developing countries bearing the greatest burden.

The aim of this study was to determine the rate of nasopharyngeal carriage and serotype distribution of *Streptococcus pneumoniae* isolates colonizing the nasopharynx of children less than five years in Egypt in order to evaluate the effectiveness of introduction the pneumococcal conjugated vaccines in Egypt.

We used PCR techniques to detect the rate of nasopharyngeal carriage, since carriage precedes invasive disease. We used three multiplex reactions to determine the serotypes distribution of *Streptococcus pneumoniae* isolates colonizing the nasopharynx of children less than five years. The nasopharyngeal carriage of *S. pneumonia* was ٥٦.٥% by using RT-PCR technique, and the prevalence of pneumococcal carriage was highest in the first few years of life, peaking at approximately ٧٠.٣% in hosts ٦ months-١ year of age and decreasing in higher age groups. This rate of carriage is similar to that in the neighboring region prevalence studies on the nasopharyngeal carriage of *S. pneumonia.*

We correctly identified the serotypes of ٦٥.٥% of the samples by multiplex PCR reactions. In our study the most common serotype was ٦A/٦B of total typeable S. pneumonia serotypes followed by ١٩ F, ٢٣ F, ٣, ٩V, ١٤, ١٩ A, ٤, ٥, ١٨ in a decreasing order. These results agree with previous studies conducted in Egypt except for serotype١, which was not detected in any isolate.

Worldwide prevalence studies on the nasopharyngeal carriage of *S. pneumoniae* have shown that, mostly, the above mentioned serotypes are involved but with slight differences in percentages among them.

The vaccines coverage in our study were ٦٠.٢%, ٦٢%, ٦٣.٧% and ٦٥.٥% for ٧, ١٠, ١١ and ١٣ polyvalent conjugate vaccines respectively. Employing the PCV١٣ vaccine increases the protective spectrum.

Our findings demonstrated co-colonization with different serotypes of *S. pneumoniae* among carriers. Rate of co-colonization was ١١.٥% among all pneumococci carriers (١٣/١١٣) and ١٧.٦% among the serotyped carrier isolates(١٣/٧٤).

Limitation of this study:

- We used a limited protocol of multiplex PCR.
- We tested only ٢٠٠ samples.
- We did not study the antimicrobial resistance as this study focused on prevalence of vaccine serotypes.