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The PneumoNIA Study Group

Comparison of childhood pneumococcal carriage and serotype distribution between inpatients with pneumonia and healthy controls in Nepal prior to pneumococcal conjugate vaccine introduction

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BACKGROUND

- Some pneumococcal serotypes are infrequently carried by healthy children but represent a large proportion of disease isolates.
- Detection of serotype-specific pneumococcal colonization in children with pneumonia, although not diagnostic of etiology at an individual level, likely enriches the group of cases for true pneumococcal pneumonia.
- We aimed to assess serotype-specific carriage among Nepalese children admitted to hospital with physician diagnosed pneumonia and compare it with that of healthy community controls prior to PCV10 introduction.

METHODS

- Community children aged 6-24 months without pneumonia were recruited from the outpatient department of Patan Hospital, Kathmandu, Nepal.
- All children aged 2 months to 14 years admitted with clinician diagnosed pneumonia to Patan Hospital were approached for enrolment into the study and those aged 6-24 months included in this analysis.
- Nasopharyngeal swabs were collected from recruited children, processed according to WHO guidelines, and serotype determined by Quellung reaction (Serum Staten Institute, Denmark).

RESULTS

- Between April 2014 and August 2015 we enrolled 1751 healthy children aged 6-24 months and 164 children with clinician diagnosed pneumonia aged 6-24 months.
- Carriage prevalence differed between the groups (p<0.0001):
  - Community children: 65% (95% CI 62.8-67.2; 1141/1751)
  - Hospitalized pneumonia children: 37.8% (95% CI 30.9-46.3; 62/164)
- In the pneumonia cohort 27% (95% CI 16.6-39.7; 17/63) of carriers had had antibiotics in the week before admission compared with 46.5% (95% CI 36.6-56.7; 47/101) of non-carriers (p=0.0140)
- Pneumococcus colonized pneumonia cases were more likely to have a PCV10 strain than were colonized community children (p=0.0166).
  - Community children: 31.2% (338/1082; 95% CI 28.5-34.1%)
  - Hospitalized children with pneumonia: 46.8% (95% CI 34-59.9, 29/62)

Serotype-specific pneumococcal carriage in children admitted with pneumonia compared with healthy community controls

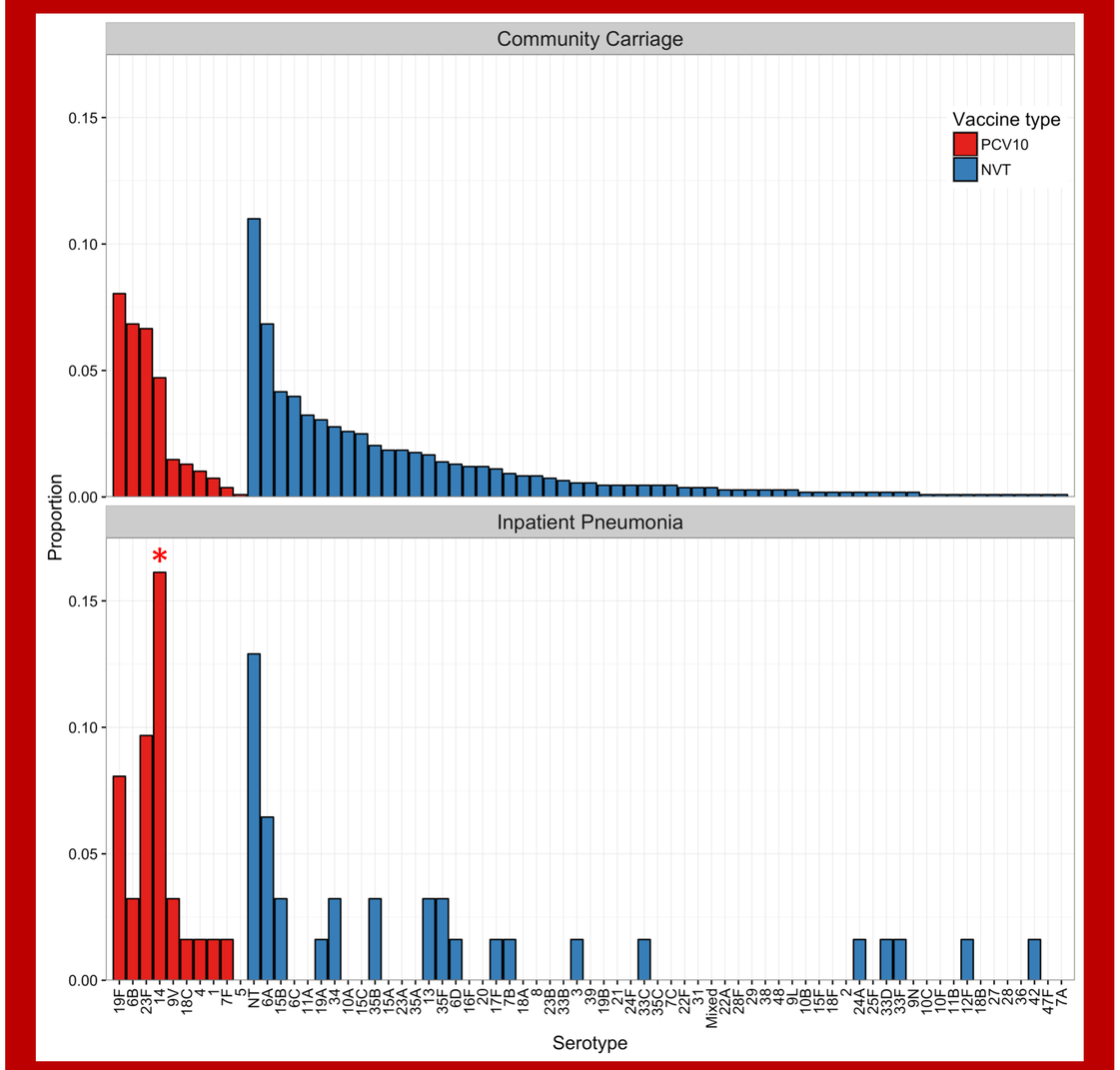

Figure 1. Serotype-specific pneumococcal carriage distribution in paediatric inpatients with pneumonia at Patan hospital, Kathmandu and healthy community controls prior to PCV10 introduction. Children were aged 6-24 months from Kathmandu, Nepal and had not received a pneumococcal conjugate vaccine had a single nasopharyngeal swab collected and any isolated pneumococci serotyped by Quellung. NT = non-typeable. *Significantly higher odds of being identified in inpatients compared with community controls (p=0.0011)

CONCLUSIONS

- Carriage prevalence in inpatients with pneumonia is significantly lower than community controls.
- Antibiotic usage prior to presentation is a significant modifier of carriage prevalence in inpatients with pneumonia.
- Assessment of pneumococcal carriage of paediatric inpatients with pneumonia may provide improved insight into PCV effect on serotypes infrequently isolated from healthy children.

FUNDING

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