

EFFECT OF GESTATIONAL AGE AND BIRTH WEIGHT ON NASO-PHARYNGEAL CARRIAGE OF PNEUMOCOCCUS IN HEALTHY CHILDREN

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INTRODUCTION

There are only a few studies comparing the association of nasopharyngeal carriage of pneumococcus with gestational age or birth weight^{1,2}. The aim of this study was to look for any association of nasopharyngeal carriage with term/preterm gestation and normal/low birth weight in healthy children in urban and rural populations in Nepal before the introduction of PCV10 vaccine. PCV10 vaccine was introduced into the national immunization program of Nepal in January 2015. Vaccine implementation commenced in different districts in a phase wise manner. In Kathmandu (the capital city), the program started in August 2015 and in Okhaldhunga (one of the rural districts) in October 2015.

METHODS

- Nasopharyngeal (NP) swabs were collected from healthy children aged 6 months to <24 months in Kathmandu (urban population) in 2014-2015 and in Okhaldhunga (rural population) in February 2015.
- Children who had fever in the last 24 hours or had taken antibiotic in the last 7 days were excluded from this study.
- In Kathmandu, the NP swabs were processed, cultured and serotyped onsite at Patan hospital, while in Okhaldhunga, NP swabs were frozen in liquid nitrogen after collection and then transported to Patan hospital for culture and serotyping.
- Gestational age (GA) was categorized as term (≥ 37 weeks GA) or preterm (<37 weeks GA) and birth weight was categorized as normal birth weight (NBW) if ≥ 2.5 kg or low birth weight (LBW) if <2.5kg.

- Birth Weight:** Of 1637 urban children, 1450 children had normal and 187 children had low birth weight. Of 476 rural children, 403 had normal and 73 had low birth weight.
- In the urban setting, the pneumococcal carriage prevalence in normal birth weight children was 64.6% (937/1450), and the carriage prevalence in low birth weight children was 64.7% (121/187), $p=0.980$.
- In rural setting, the carriage prevalence in normal birth weight children was 82.9% (334/403) and the carriage prevalence in low birth weight children was 71.2% (52/73), $p=0.019$

RESULTS

- Of the total 2349 healthy children enrolled, information on gestational age was available for 1689 urban children and 600 rural children, and birth weight was available for 1637 urban children and 476 rural children.
- Gestational Age:** Of 1689 urban children, 1579 children were born at term and 110 were born preterm. Of 600 rural children, 592 children were born at term and 8 were born preterm.
- In the urban setting, the pneumococcal carriage prevalence in term children was 65.5% (1034/1579), while the carriage prevalence in preterm children was 60.0% (66/110), $p=0.243$.
- In the rural setting, the carriage prevalence in term children was 83.6% (495/592) and the carriage prevalence in preterm children was 62.5% (5/8), $p=0.110$.

Pneumococcal carriage based on birth weight

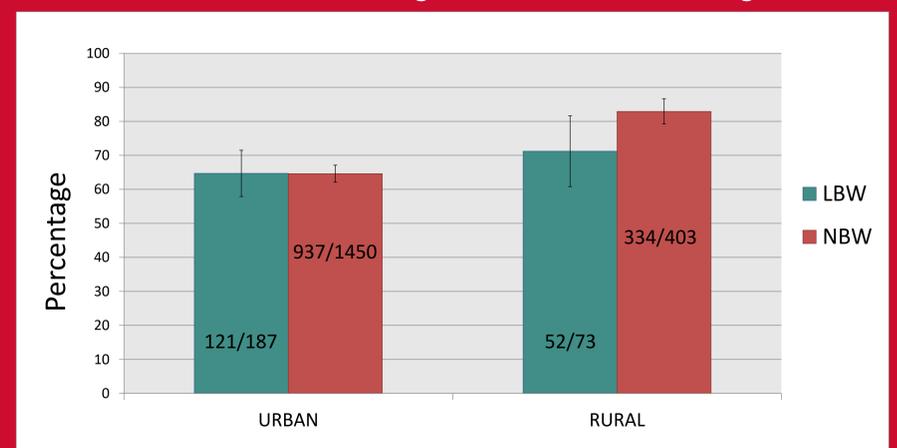


Figure 2: In the urban setting, the difference in pneumococcal carriage prevalence between NBW (64.6%) and LBW (64.7%) children was not statistically significant, $p = 0.980$. In the rural population, the carriage prevalence in NBW children (82.9%) was found to be significantly higher than in LBW children (71.2%), $p = 0.019$.

CONCLUSION

- No significant difference in nasopharyngeal pneumococcal carriage was seen between term and preterm children in both urban and rural populations.
- No significant difference in pneumococcal carriage was seen between normal birth weight and low birth weight children in urban population.
- However, in the rural population, a significantly higher pneumococcal carriage was seen in normal birth weight children than in low birth weight children.
- While further studies are required to confirm the findings, gestational age and birth weight do not seem to have major effects on carriage rate. The low carriage rate in low birth weight children in the rural setting may indicate differences in child rearing practices in this setting for babies with low birth weight.

REFERENCES

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This work is made possible with support from Gavi, the Vaccine Alliance

Pneumococcal carriage based on gestational age

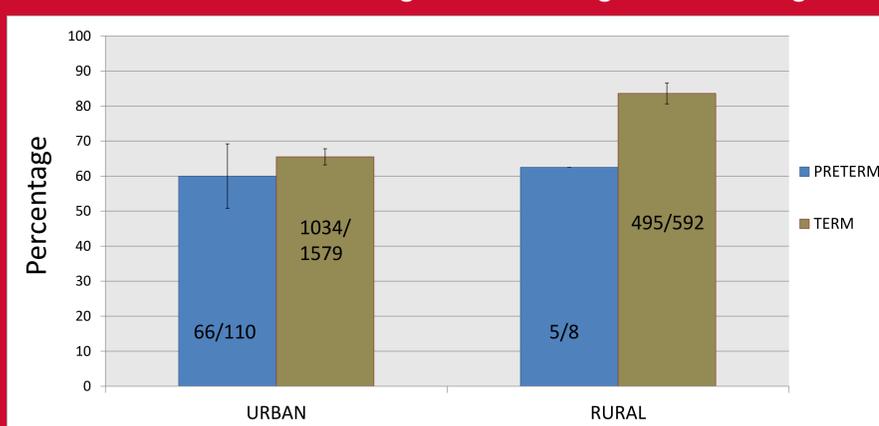


Figure 1: In the urban setting, the difference in pneumococcal carriage prevalence between term children (65.5%) and preterm children (60.0%) was not statistically significant, $p = 0.243$. Similarly, in the rural setting, the difference in carriage prevalence between term (83.6%) and preterm children (62.5%) was not statistically different, $p = 0.110$. The CI for rural preterm children could not be calculated because of small sample size.