

Risk Factors for Pneumonia and Pneumococcal Vaccine Serotypes Among Children in Afghanistan

Rahmani Zabihullah^a, **Bhim Gopal Dhoubhadel**^{b*}, Ferogh Abdul Rauf^c, Sahab Ahmad Shafiq^c, Motoi Suzuki^a, Kiwao Watanabe^a, Lay Myint Yoshida^a, Michio Yasunami^a, Salihi Zabihullah^c, Christopher M Parry^b, Rabi Mirwais^d, Koya Ariyoshi^a

^aInstitute of Tropical Medicine, Graduate School of Biomedical Sciences, Nagasaki University, Japan; ^bSchool of Tropical Medicine and Global Health, Nagasaki University, Japan; ^cAbu Ali Sina Balkhi Regional Hospital, Mazar-e-Sharif, Afghanistan; ^dPublic Health Department, Balkh Province, Afghanistan.

Abstract

Objective: To investigate risk factors for death due to pneumonia at the time of hospitalization, and pneumococcal serotype distribution in children in Afghanistan.

Methods: We enrolled 639 under-5 children who fulfilled the World Health Organization (WHO) criteria for clinical pneumonia in a regional hospital in Afghanistan. Epidemiological, clinical and laboratory data were collected, and nasopharyngeal carriage of pneumococcus and its serotypes were determined.

Findings: Malnutrition was detected in 39.9%, anaemia in 46.3%, and maternal illiteracy was reported in 85.9%. The case fatality ratio (CFR) of pneumonia was 12.1% (75/617) (95% CI: 9.6-14.9) with three quarters of the deaths occurring within 2 days of hospitalization. Age less than one month and malnutrition were the major risk factors for death, whereas female sex was also found to a risk factor among malnourished group of children. BCG vaccination was protective. Pneumococcus was detected in 38.0% (124/326), which was characterized by 22 different serotypes. The thirteen-valent pneumococcal conjugate vaccine (PCV13) covered 41.1% of the circulating serotypes.

Conclusion: Early detection and treatment of serious pneumonia cases, and dietary interventions for malnutrition are urgently needed in Afghanistan. Although pneumococcal conjugate vaccine serotypes cover less than 50% of the circulating serotypes, the vaccination programme still can save many children's lives.