Nasal carriage rate and antibiotic susceptibility pattern of Neisseria meningitidis among healthy Ethiopian children and adolescents

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Abstract

Background: Community nasal meningococcal carriage rates are high across Africa. Meningococcal infections are major causes of morbidity and mortality in the continent; especially among children and adolescents. This study aimed to determine the prevalence of nasal carriage and antibiotic susceptibilities of meningococcal isolates from healthy Ethiopian children and adolescents.

Method: A cross-sectional study was conducted in one of the sub-cities of Addis Ababa, Ethiopia. Nasal swabs were collected and processed for identification, serogrouping and testingsusceptibilities for three antibiotics using standard microbiological techniques. Data on epidemiologic risk factors were collected using a structured questionnaire and the magnitude of their association with carriage was assessed using bivariate and multivariate analysis.

Result: A total of 240 samples were collected (115 from males and 125 from females). The mean age of study participants was 11.1 years. The prevalence of nasal carriage for *Neisseria meningitidis* was 20.4% (49/240). Carriage was significantly higher among children living under crowded conditions (OR1.268; 95% CI: 1.186 – 1.355; p = 0.006). The predominant serogroups were W135 – 20/49 isolates (40.8%) and C - 12/49 isolates (24.5%) and 83.7% of meningococci were sensitive for Ciprofloxacin. In contrast, isolates showed high resistance to Ceftriaxone (69.4%) while only 4.2% were sensitive for Penicillin. Multi-drug resistance was documented for 14.3% of the isolates.

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Conclusions: Meningococcal carriage rate was found to be high with higher rates associated with children and adolescents living in crowded living conditions. Predominant isolates were of serogroup W135 and C and the isolates showed marked susceptibility to Ciprofloxacin and resistance to Ceftriaxone and Penicillin.

Keywords: *N. meningitidis*, Nasal carriage, Antibiotic susceptibility, Serogroup, Children, Adolescents, Ethiopia

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