

Carriage rate of Meningococcal Meningitis among Riyadh Population, 2002

Meningococcal carriers are the primary source of transmission of infection under both epidemic and endemic conditions, where the risk of epidemic increases with the percentage of carriers in the population. This study aims to determine the carriage rate of meningococci among the population of Riyadh, Saudi Arabia.

The study was conducted using a cross-sectional approach. A total sample size of 700 was determined. Seven Primary Health Care Centers (PHCC) were selected randomly using a list of all PHCC in Riyadh city provided by the Riyadh Regional Health Affairs. For each PHCC selected, an equal number of male and female patients were taken, regardless of the type of complaint. All ages over 5 years were considered eligible. Systemic random sampling was done, where every fifth patient coming to the PHCC was selected. All were interviewed and an oro-pharyngeal swab was taken. A pre-designed questionnaire was created inquiring on demographic information, possible factors that influence carriage of meningococci (e.g. vaccination status, type of vaccination, antibiotic uses during the past four weeks, contact with meningococcal meningitis case) and indicators of living to calculate the index for crowding. All swabs collected were sent to the microbiology laboratory at Al-Sulaimaniah Children Hospital in Riyadh.

During the period from 3-9 February 2002 (21-27/11/1422 H), we were able to interview 700 persons who had visited one of the seven selected PHCC's in Riyadh. The mean age was 27.4 ± 14.3 . Males accounted to 52% and females 48%. There was no significant difference between the ages of males and females. The majority of the sample selected were Saudis (73%) followed by Egyptians, Sudanese, Yemenis, Pakistanis, and Bangladeshis.

Regarding vaccination status, 51.1% were vaccinated, the majority of them had taken the bivalent vaccine (47.4%) and an almost equal number don't know which type of vaccine they had received (48.6%). Four persons (1.1%) reported receiving the

single vaccine "A". Those who took the single vaccine were vaccinated more than 3 years previously, and were therefore not protected. Among others who reported their being vaccinated, only 187 (52.2%) were vaccinated within the last three years.

Among the 700 Oro-Pharyngeal Swabs, 44 (6.3%) were culture positive for *Moraxella Catarrhalis*, and 38 (5.4%) for other types of *Neisseria* rather than *meningitidis*. Among other *Neisseria* types, there were 2 (0.3%) *Neisseria Cinerea*, 29 (4.1%) *Neisseria Elongata*, 6 (0.9%) *Neisseria Gonorrhoeae*, and 1 (0.1%) *Neisseria Subflava*. Non of the cultures were positive for *Neisseria Meningitidis*.

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Editorial notes: Meningococcal meningitis is an inflammation of the lining of the brain and spinal cord that can lead to sudden death or permanent brain damage, especially among young children. Five to ten percent of those suffering from the disease die as a result.¹ Its infectious agent is *Neisseria meningitidis*, which is a gram-negative bacterium that occurs in pairs (diplococcus). The serogroup of meningococcus is determined by its polysaccharide capsular antigen, and the serogroup of culture can be recognized by slide agglutination.² Meningococcal meningitis is also common in regions with high temperature and is widespread in the so-called "meningitis belt" of sub-Saharan Africa, from Ethiopia in the east to Senegal in the west. In this particular area, epidemic waves are seen every 8-14 years.¹ The incidence of meningococcal meningitis is 1-3 per 100,000 population in Europe, and America and 10-25 per 100,000 populations in developing countries. Incidence rate of up to 200-800 cases per 100,000 populations have been reported during epidemics.³

Transient nasopharyngeal carriage rather than disease is the normal status of meningococcal colonization. The natural habitat of the meningococci is the human nasopharynx.

Among healthy children 5-15% are carriers of *Neisseria Meningitidis*, compared to 1% of the adult population. In countries with endemic disease, up to 5-10% of the population may be asymptomatic carriers.^{2,4} Meningococcal carriers are the primary source of transmission of infection under both epidemic and endemic conditions where the risk of epidemic increases with the percentage of carriers in the population.⁴ While vaccination is 90 to 95% effective in prevention of disease it does not protect against nasopharyngeal carriage of the bacteria.⁵

This study revealed that the carriage rate for *Neisseria meningitidis* among Riyadh population is 0%. Published studies have shown that the carriage rate of *Neisseria meningitidis* among adults is 1%.⁴ This study was conducted in a population more than 5 years of age, and most of them were adults.

A study with a larger sample size is recommended to provide additional evidence for the very low carriage rate in the Riyadh population. Meningococcal meningitis vaccination program should be strengthened in Riyadh city, a population with low carriage rate and in turn at high epidemic risk.

References:

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