



Review

Meningococcal disease in the Asia-Pacific region: Findings and recommendations from the Global Meningococcal Initiative



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ABSTRACT

The Global Meningococcal Initiative (GMI) is a global expert group that includes scientists, clinicians, and public health officials with a wide range of specialties. The purpose of the Initiative is to promote the global prevention of meningococcal disease (MD) through education, research, and cooperation. The first Asia-Pacific regional meeting was held in November 2014. The GMI reviewed the epidemiology of MD, surveillance, and prevention strategies, and outbreak control practices from participating countries in the Asia-Pacific region. Although, in general, MD is underreported in this region, serogroup A disease is most prominent in low-income countries such as India and the Philippines, while Taiwan, Japan, and Korea reported disease from serogroups C, W, and Y. China has a mixed epidemiology of serogroups A, B, C, and W.

Perspectives from countries outside of the region were also provided to provide insight into lessons learnt. Based on the available data and meeting discussions, a number of challenges and data gaps were identified and, as a consequence, several recommendations were formulated: strengthen surveillance; improve diagnosis, typing and case reporting; standardize case definitions; develop guidelines for outbreak management; and promote awareness of MD among healthcare professionals, public health officials, and the general public.

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Abbreviations: CBHI, Central Bureau of Health Intelligence; CDC, [US] Centers for Disease Control and Prevention; CI, confidence interval; CSF, cerebrospinal fluid; DNA, deoxyribonucleic acid; GMI, Global Meningococcal Initiative; HCP, healthcare practitioner; HIRA, Health Insurance Review and Assessment Service; KCDC, Korea Centers for Disease Control and Prevention; MCC, meningococcal C conjugate; MCV4, tetravalent meningococcal conjugate vaccine; MD, meningococcal disease; Men C/Men W, meningococcal group C/meningococcal group W; MPSV4, tetravalent meningococcal polysaccharide vaccine; NCR, National Capital Region; NESID, National Epidemiological Surveillance of Infectious Diseases; NIID, National Institute of Infectious Diseases; OMV, outer membrane vaccine; PCR, polymerase chain reaction; PIDSR, Philippine Integrated Disease Surveillance and Response; WHO, World Health Organization.

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1. Introduction

Neisseria meningitidis is a leading cause of meningitis and septicemia and is estimated to cause more than 1.2 million cases of invasive meningococcal disease (MD) and 135,000 deaths each year across the globe [1,2]. MD is associated with substantial morbidity and high fatality rates (~10–20%, although higher rates of ~30% have been reported for serogroup W alone) [3,4]. However, in many countries in the Asia-Pacific region, the true burden of disease is unknown because the epidemiology of MD is not well described [5]. Indeed, in countries such as the Republic of Korea and Japan, which have frequently reported a low incidence of MD, the disease is not considered a high healthcare priority.

The Global Meningococcal Initiative (GMI) was established in 2009 to promote the global prevention of MD through education, research and cooperation. It comprises some 50 scientists and clinicians from around the world with expertise in meningococcal immunology, epidemiology, public health, and vaccinology. A regional meeting of the GMI was convened with the goal of gaining a better understanding of MD in the Asia-Pacific region. This article summarizes the discussions that took place at the meeting and outlines the regional recommendations for the control and prevention of MD based on the available data and regional expert opinion.

2. Meeting

2.1. Overview

The meeting, the first to be convened in the Asia-Pacific region, was held in Incheon, Republic of Korea, on 20–21 November 2014. The aim of the meeting was to provide an update on the epidemiology of MD in this region, with a particular emphasis on the recent outbreaks that have been reported in a number of Asia-Pacific countries and the control strategies that have been implemented.

Members from countries outside the region were also invited to share their experiences and the lessons learned from their vaccination and outbreak programs (e.g., reactive quadrivalent [serogroups A, C, W and Y] meningococcal conjugate vaccination in Chile, control of meningococcal group W [Men W] outbreaks in Latin America, Men B outbreaks in the United States, and Men A outbreaks in sub-Saharan Africa).

Representatives were not available from all Asia-Pacific countries and therefore this article focuses on those present at the GMI meeting.

2.2. Objectives

The specific objectives of the meeting were to: (1) understand the epidemiology of MD in the Asia-Pacific region over the past decade; (2) examine the surveillance and prevention strategies in Asia; (3) discuss key learning points from experience with meningococcal vaccine programs, and how these may be applied elsewhere; (4) develop recommendations to improve diagnosis and surveillance, and for the control and prevention of MD in Asia, including outbreak preparedness; and (5) devise methods for the dissemination of information.

3. Discussion

3.1. Overview of MD across the globe

The epidemiologic profile of MD varies across the globe; however, 6 of the 12 recognized serogroups (A, B, C, W, X, and Y) are known to cause the majority of the disease worldwide [6]. In Europe and North America, where serogroups B and C predominate, the disease is endemic, with a low overall incidence (~1 per 100,000), characterized by seasonal peaks and small clusters of cases [7]. By contrast, in the “meningitis belt” of sub-Saharan Africa, large periodic epidemics of MD occur frequently with an incidence that may reach 1000 per 100,000. Most African epidemics have been caused by meningococci belonging to serogroup A, but outbreaks of serogroup C, W, and X disease have also been recorded [7]. Although epidemiologic data from Asia are limited, it has been suggested that serogroup A and C predominate; but serogroup W is increasingly reported in several countries, such as China [8–10].

3.1.1. Latin America

In Latin America, incidence rates and serogroup distribution are highly variable, with the highest burden of disease reported in Brazil and the Southern Cone countries (Argentina, Chile, and Uruguay) [11]. Serogroups B and C are reported to be responsible for the majority of cases reported in the region, although there has been a recent increase of serogroup W disease in Argentina, Chile, and Southern Brazil [11]. In addition, it has been noted that the carriage data for Men W (cc11) from Chile were similar to the Men C (cc11) carriage data from the UK before the meningococcal serogroup C conjugate (MCC) vaccine introduction took place in

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