Editorial

Prevention strategies for invasive meningococcal infections in the APAC region – A Joint Consensus

Dr. Mike Yat Wah KWAN

Author's Affiliation:
1- Consultant Paediatric Infectious Diseases of the Department of Paediatrics and Adolescent Medicine and Head of the Paediatric Infectious Diseases Unit of the Hospital Authority Infectious Disease Centre (HAIDC) at Princess Margaret Hospital, Hong Kong;
2- President of the Asian Society for Pediatric Infectious Diseases (ASPID);
3- Board member (ASPID) of the World Society for Pediatric Infectious Diseases (WSPID);
4- Standing Committee member (East Asia) of the Asia Pacific Pediatrics Association (APPA);
5- Council member of the Hong Kong Paediatric Society.

Correspondence:
Dr. Mike Yat Wah KWAN, Email: mikekwanyw@gmail.com

Received on: 25-Mar-2025 Accepted for Publication: 25-Mar-2025

Invasive meningococcal disease (IMD) is a severe infection, occurs when the pathogen Neisseria meningitidis colonizes the upper respiratory tract, enters the bloodstream and invades the body's major organs.[1] Colonization of the oropharyngeal mucosa by N. meningitidis often occurs without symptoms (referred to as the 'carriage' state), only a small proportion of such individuals develop IMD, but they serve as a reservoir of transmission to others, some of whom may develop IMD.[2,3] The carriage prevalence of N. meningitidis is generally highest in adolescents and young adults, and colonization rates differ among ethnic groups.[1,4]

Patients infected with N. meningitidis typically present with non-specific symptoms such as fever, nausea and vomiting, headache, myalgia, neck stiffness and altered mental status, symptoms that may easily be confused with 'flu-like illnesses,' malaria, central nervous system infection or other conditions, which contribute to delays in diagnosis.[4] Approximately 40–70% of patients present with meningococcal septicemia, including symptoms such as circulatory insufficiency, shock and purpuric rash.[5,6] Patients may present with combined meningitis and septicemia,[4,6] and less common presentations include pneumonia, septic arthritis and pericarditis.[4,6] Without prompt antimicrobial treatment, IMD can be fatal, with a fatality rate of about 10%, and long-term sequelae such as brain damage, hearing loss, limb amputation, and skin scarring occur in up to 30% of survivors.[7]

The efficacy of antimicrobial treatment may be limited by antibiotic resistance, and strains of N. meningitidis resistant to chloramphenicol, ciprofloxacin and penicillin have been documented throughout the Asia-Pacific (APAC) region, complicating the management of IMD.[8,9] For example, in Japan, 41 of 87 (47.1%) isolates tested were non-susceptible to penicillin (including four [4.6%] resistant), eight (9.2%) non-susceptible to ciprofloxacin (five [5.7%] resistant) and three (3.4%) were resistant to azithromycin.[8]

The epidemiology of IMD varies by geography and has also evolved in response to the availability of vaccines against the five major disease-causing serogroups (MenA, MenB, MenC, MenW, and MenY).[4] Policy for vaccine prevention also varies substantially within the APAC region. Furthermore, emerging data from other regions

suggest that the public health measures adopted during the coronavirus disease 2019 (COVID-19) pandemic have had impacts on IMD prevalence, vaccination rates, and potentially antibiotic resistance.[10]

In April 2024, a meeting of experts from the APAC region reviewed data on the epidemiology and burden of IMD and formulate consensus statements on IMD surveillance and vaccination programs for the region in the post-pandemic era. During the meeting, the advisory group noted that many countries do not include meningococcal vaccines in their routine vaccination programmes. There is also substantial variation in the types of samples tested [blood or cerebrospinal fluid] and the methods used [culture or polymerase chain reaction (PCR)]. In addition, epidemiological data may be underestimated in certain areas due to early antibiotic treatment and inconsistent surveillance approaches. Nations should consider adding meningococcal vaccines to their immunization programmes. The article "**Joint consensus on reducing the burden of invasive meningococcal disease in the Asia-Pacific region**"[11] was published online on 19th March 2025 in "Human Vaccines & Immunotherapeutics", you are most welcomed to read this consensus and share with us any comments.

IMD is a severe infection that may lead to serious clinical sequelae. It is important to improve the national surveillance system to provide accurate and consistent data on the disease burden. It is also important to overcome vaccine hesitancy by raising public awareness of meningococcal vaccines' effectiveness in preventing IMD in children, adolescents, young adults and individuals at risk, which is confirmed by real-world evidence.

Our joint consensus emphasizes the need to adapt vaccination policy to local conditions guided by local data and experts. Local healthcare providers may consider including IMD as a notifiable disease and to include both MenACWY and MenB vaccines in the national immunization programmes.

Last but not the least, we are deeply saddened by the devastating earthquake that has struck Myanmar, Thailand and China, causing the loss of precious lives, injuries, and widespread destructions. Our hearts go out to the families who have lost their loved ones, especially children, in this tragic disaster. We sincerely hope that people there could have received appropriate and timely help and support. We pray for them and God bless everyone.

References:

1. Marshall HS. **Meningococcal surveillance in Southeast Asia and the Pacific**. Microbiol Aust. 2021;42(4):178–181. doi: 10.1071/MA21050.
2. Yazdankhah SP, Caugant DA. **Neisseria meningitidis: an overview of the carriage state**. J Med Microbiol. 2004;53(9):821–832. doi: 10. 1099/jmm.0.45529-0.
3. Caugant DA, Tzanakaki G, Kriz P. **Lessons from meningococcal carriage studies**. FEMS Microbiol Rev. 2007;31(1):52–63. doi:10.1111/j.1574-6976.2006.00052.x.
4. van de Beek D, Brouwer MC, Koedel U, Wall EC. **Community-acquired bacterial meningitis**. (10306):1171–1183. doi: 10.1016/S0140-6736(21)00883-7.
5. Thompson MJ, Ninis N, Perera R, Mayon-White R, Phillips C, Bailey L, Harnden A, Mant D, Levin M. **Clinical recognition of meningococcal disease in children and adolescents**. Lancet. 2006;367(9508):397–403. doi: 10.1016/S0140-6736(06)67932-4.
6. Nadel S, Ninis N. **Invasive meningococcal disease in the vaccine era**. Front Pediatr. 2018;6:321. doi:10.3389/fped.2018.00321.
7. Vyse A, Anonychuk A, Jäkel A, Wieffer H, Nadel S. **The burden and impact of severe and long-term sequelae of**

meningococcal disease. Expert Rev Anti Infect Ther. 2013;11(6):597–604. doi:10.1586/eri.13.42.

8. Saito R, Nakajima J, Prah I, Morita M, Mahazu S, Ota Y, Kobayashi A, Tohda S, Kamiya H, Takahashi H, et al. **Penicillin-and ciprofloxacin-resistant invasive Neisseria meningitidis isolates from Japan**. Microbiol Spectr. 2022;10(3):e0062722. doi:10.1128/spectrum.00627-22.
9. The Nguyen PN, Hung NT, Mathur G, Pinto TJP, Minh NHL. **Review of the epidemiology, diagnosis and management of invasive meningococcal disease in Vietnam**. Hum Vaccin Immunother. 2023;19(1):2172922. doi: 10.1080/21645515.2023.2172922.
10. Alderson MR, Arkwright PD, Bai X, Black S, Borrow R, Caugant DA, Dinleyici EC, Harrison LH, Lucidarme J, McNamara LA, et al. **Surveillance and control of meningococcal disease in the COVID-19 era: a global meningococcal initiative review**. J Infect. 2022;84(3):289–296. doi: 10.1016/j.jinf.2021.11.016.
11. Gang Liu, Maria Liza Antoinette M. Gonzales, Wai Hung Chan, Iqbal Ahmad Memon, Anggraini Alam, Hyunju Lee, Hetti Wickramasinghe, Quang Thai Pham, Rajeshwar Dayal, Michael Levin, Yhu-Chering Huang, Jim Buttery, Anna Lisa T. Ong-Lim & Mike Yat Wah Kwan. **Joint consensus on reducing the burden of invasive meningococcal disease in the Asia-Pacific region**. Human Vaccines & Immunotherapeutics, 21:1, 2477965, DOI: 10.1080/21645515.2025.2477965