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Letter to the Editor

The need for inclusion of the Hib vaccine in mainland national immunization program in China

In this Journal, Hani and colleagues recently reported the remarkable impact of the glycoconjugate *Haemophilus influenzae* vaccine on national disease rates.[1] *Haemophilus influenzae* type b (Hib) is a major cause of severe infections in children, posing a critical public health issue. Hib conjugate vaccines are included in national immunization programs (NIP) worldwide, except for mainland China and Hong Kong.

Hib remains a significant cause of severe infectious diseases in children, including meningitis, sepsis, and pneumonia, with high morbidity and mortality rates, making Hib a critical public health concern. Globally, Hib conjugate vaccines have been incorporated in the NIP of almost all countries and regions. In England and Wales, invasive Hib disease incidence among children younger than 5 years decreased from 22.9/100,1000 in 1991 to 0.06/100,000 in 2012.[2]

However, according to the World Health Organization, mainland China and Hong Kong are notable exceptions in this global effort to prevent Hib-related diseases (appendix).

Studies in some less developed regions have shown prevalence rates similar to those in Western countries, ranging from 21 to 60 cases per 100,000 children under 5 years of age.[3] Although there has been a relative scarcity of studies on Hib disease in Asia, particularly within China, the historical data and research findings that do exist have consistently demonstrated that Hib is a significant pathogen. Since the 1990s, we have conducted systematic studies on meningitis and pneumonia among children in mainland China.[4]

From 1988 to 1989, we conducted a study on the etiology of bacterial meningitis in Beijing Children's Hospital (BCH). The results indicated that Hib was identified as the etiological agent in 37 (28.9%) of the 128 cases. Notably, only 4 (10.8%) of the 37 Hib-positive cases had positive cerebrospinal fluid culture (CSF) results. Epidemiological data from Hefei city demonstrated Hib as a major pathogen in pediatric bacterial meningitis, accounting for 51.7% of all cases, with an annual incidence rate of 10.4 per 100,000, which is lower than the global average. This lower incidence rate was attributed primarily to the rampant misuse of antibiotics, and antibiotics abuse and the consistently low culture-positive rates represent pervasive challenges in the Orient, particularly in China. Prior use of antibiotics may also contribute to the low incidence of Hib meningitis in Asia. Furthermore, antibiotics may prevent bacteremia, thereby mitigating the occurrence of meningitis. Through a sensitive *Staphylococcus aureus* assay, we observed that 43% of CSF samples obtained from patients with bacterial meningitis contained antibacterial activities, and significantly fewer bacteria were isolated from samples containing antimicrobial activity.[5] A 5-year retrospective survey of invasive Hib diseases in Hong Kong showed that the annual incidence among children < 5 years was 2.7 per 100,000. However, the incidence among Vietnamese residents was up to 42.7 per 100,000.[6] The high incidence among Vietnamese refugees may potentially be attributed to the limited or non-existent use of antibiotics prior to hospital admission.

Community-acquired pneumonia (CAP) is the primary cause of mortality among Chinese children. To highlight the significance of bacterial agents in childhood CAP in China, we extended our project to study the etiology of childhood CAP in Beijing and Hefei, which showed that approximately one-fourth to one-third of CAP cases could potentially be attributed to Hib.[4] We conducted a serologic study on 102 patients in Beijing and 54 patients in Hefei, who exhibited symptoms and signs consistent with CAP. In the study, Hib was identified as the probable pathogen in 10% of all cases.[7] Nasopharyngeal swab specimens were procured from 96 patients diagnosed with CAP, and 214 age-matched control patients exhibiting diarrhea or dermatitis. Notably, the prevalence of Hib colonization was significantly higher among CAP patients (7.3%) compared to the control group (1.9%). The outcomes of these nasopharyngeal cultures offer compelling evidence to support the implication of Hib as a causative agent of childhood CAP.[8]

Furthermore, we detected Hib in paraffin-embedded lung tissue autopsy samples obtained from autopsies of children who succumbed to CAP in China between 1953 and 2002, and Hib was identified as the causative agent in 17.8% of the instances.[9]

Collectively, these studies furnish compelling evidence that Hib is a significant pathogen in the Chinese pediatric population. Hib national coverage was less than 5% in less socioeconomically developed provinces in the western region of China,[10] which poses a potential risk to the health of most children in China.

In Conclusion, the inclusion of the Hib vaccine in mainland China's NIP has been long delayed. We emphatically urge that Hib vaccine be included in the NIP, thereby aligning China with global public health standards. It is said that authoritative institutions are considering incorporating Hib into NIP, hoping to achieve it soon.

Author contributions

All authors conceived of and planned this letter. DY screened the literature and YY prepared the first draft of the manuscript, all authors discussed and edited the manuscript.

Declaration of Competing Interest

We declare no competing interests.

Declaration of Generative AI and AI-assisted technologies in the writing process

Artificial intelligence was not used in the preparation of this manuscript.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.jinf.2024.106386.

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