

**Emerging and Re-emerging  
Microbial Threats to Health:  
Are Children Vulnerable?**

In spite of our phenomenal successes against infectious diseases, including vaccines and antimicrobials, microbial threats to human health continue to plague us. By definition, any infectious diseases of public health importance, appearing anew, increasing in incidence, or spreading to new geographic territories in recent times are emerging problems and those re-appearing after prolonged absence are re-emerging problems. Microbes acquiring new pathogenetic toxins or resistance to important antimicrobials also emerge as threats to human health. A 'New' disease may be caused by a newly mutated microbe, or by a newly recognized microbe; in the latter case the recognition of the pathogen helps in clearly defining both the illness and its epidemiology. These issues have been highlighted by the report (1993) of a committee appointed by the Institute of Medicine of the Academy of Sciences, USA, to review the situation and recommend remedial steps, relevant to that country. The committee pointed out that the problem was of global concern. The World Health Organization followed up with its own meeting of experts (1994) to examine the seriousness of the problem. In January 1996, many medical journals around the world have alerted their readers of the realities and remedies of emerging microbial threats.

Are emerging infectious diseases of concern to pediatricians? Are children

vulnerable to such diseases? As we examine illustrative examples of emerging pathogens relevant to India, the answers will become clear.

The most important example of a new infectious disease is the acquired immunodeficiency syndrome (AIDS) due to infection by the human immunodeficiency virus (HIV), introduced into India perhaps in the early 1980s. Among pregnant women, the prevalence of HIV infection is about 0.1% in Vellore, 1% in Bombay and 4% in Manipur. At the most conservative rate of 0.1%, annually over 25,000 HIV-infected women are delivering their babies in India. At an estimated frequency of 20% vertical transmission of infection, at least 5000 babies are infected perinatally with HIV annually. During the decade of 1990s, over 50,000 infants would be having pediatric AIDS, with cent per cent case fatality. Are we recognizing pediatric AIDS in our institutions and clinics? Are we taking steps to reduce the impact of this epidemic and to reduce its incidence? Are we taking effective steps to prevent nosocomial transmission of HIV? Are we recommending azidothymidine prophylaxis to prevent vertical transmission?

Widespread occurrence of dengue fever has been recognized in India for many decades. However dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) outbreaks had spared India, until 1987 when the first outbreak occurred in Madras. Since then such outbreaks have occurred in many towns and cities in India. The brunt of such outbreaks have been faced by school-age children. If the experience of other countries in which DHF/DSS appeared newly is an indication,

we will have increasing frequency of such outbreaks. Unless diagnosed early and treated appropriately, the case fatality could be as high as 30%. All of us must learn the clinical criteria to diagnose DHF and to grade severity. How many institutions have diagnostic facilities to detect dengue virus infection?

Typhoid fever in children, due to *Salmonella typhi* resistant to chloramphenicol, ampicillin and trimethoprim-sulphamethoxazole has been reported from many regions of India since 1988. Out-breaks in neonatal nurseries of multi-drug-resistant microbial infections (e.g., *S. typhimurium*, *methicillin-resistant Staphylococcus aureus*) are not infrequent in hospitals in India,

Pediatric leptospirosis and melioidosis are probably widely prevalent in certain regions of India, but are under-diagnosed and under-reported; both these diseases cannot be diagnosed without the backing of good microbiology laboratory service. Acute neurological diseases of presumptive infectious etiology are common in India, both in urban and rural settings. Many institutions do not have facilities to make specific etiological diagnosis of acute neurological infections which include cerebral malaria, Japanese encephalitis and bacterial meningitis, to cite three common examples. In many places such acute brain infections are called brain fever and not

treated correctly. Without appropriate therapy, each condition is associated with high case fatality. Families accept a fatalistic attitude when their children die, even when we are at fault with our incomplete diagnosis and incorrect therapy.

In 1994 bubonic and pneumonic plague reappeared in India after being absent for several decades. Children are as vulnerable as adults to all emerging and re-emerging infectious diseases. These diseases emerge as a result of our interference in the ecology of our environment, our frequent travels, and the breakdown of public health measures and the adaptations of the microbes to new chemicals. We as pediatricians must realize the importance of the supporting laboratories to ensure correct diagnosis of infectious diseases. We must use antimicrobials rationally and optimally. Overuse leads to rapid development of resistance. Only after learning of the spectrum of previously recognized pathogens will we ever become capable of recognizing new, emerging or re-emerging pathogens.

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