

implementation of pneumococcal conjugate vaccines, and to monitor circulating strains to consider vaccine effectiveness and subsequent substitution of serotypes.

This study over two years has rendered useful information on the incidence, clinical spectrum and serogroups of IPD in children. Pneumococcal meningitis still remains to be a serious problem globally in spite of potent antibiotic usage and adjunct therapy. This study can serve as a touchstone for successful surveillance in India since further amelioration in therapy might be futile.

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Invasive Pneumococcal Disease and India

Pediatrician's Perspective

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In this issue of *Indian Pediatrics*, Nisarga and colleagues have surveyed for the pneumococcal disease in Bangalore through the Pneumonet Programme [1], and have attempted to curtail the knowledge gap regarding the burden of invasive pneumococcal disease and distribution of pneumococcal serotypes in India. Many

other surveillance programmes like SAPNA, INCLIN, IBIS and ASAP are also working to assess the invasive pneumococcal disease burden in India. Knowing disease burden is important to make decisions regarding the introduction of pneumococcal vaccine in National immunization program. Many multi-centric [2] and

single-site studies [3,4] have previously shown the significant presence of invasive pneumococcal diseases amongst Indian children, but these are now more than a decade old. The changes, which have occurred during these years, are not fully known. Skimpy data hinder the decision regarding introduction of vaccine. The Pneumonet study published in Indian Pediatrics is a two-year multi-centric hospital-based surveillance for pneumonia and invasive pneumococcal diseases in children under five years of age. Though it is a multi-centric study, the representation is for Bangalore only. It is difficult to generalize the findings but the study has tried to demonstrate every aspect of the disease. The investigators have worked on the isolation, identification, serotyping and antibiotic resistance patterns of pneumococcus.

The surveillance of over 9000 children from Bangalore has found 40 confirmed cases of invasive pneumococcal disease and shows the presence of non-vaccine serotypes. Albeit, the serotyping was not performed for all the isolates, it still can pinpoint the change occurring in serotype distribution and hint towards the potential of non-vaccine pneumococcal serotypes causing severe invasive diseases. According to Nisarga and colleagues [1], serotype 6A is the most commonly encountered serotype, which is in contrast with the findings of a systematic review of surveillance studies [5], where it was found that the most prevalent vaccine serotypes were 14, 5, 1, 19F and 6B. This finding also highlights the changing trends of the serotypes over the years.

Nisarga, *et al.* found pneumococcus being most resistant against the antibiotic trimethoprim/sulphamethoxazole that is similar to the findings of a recent systematic review [5,6]. The study's selective preference for using non-culture methods like polymerase chain reaction (PCR) and antigen testing is another shortcoming. Obtaining positive cultures in a pediatric population is difficult, and if prior antibiotic has been administered it is even more difficult to isolate the organism. The study population was children under five years of age of which 20% had received prior antibiotics which affects the isolation rate. The study has not used the latex agglutination test and has made limited use of PCR for identifying the organisms.

The current study also lacks in updating the information on economic burden for invasive pneumococcal disease, which is an important factor for determining the disease burden and deciding upon the

policy decisions regarding future actions. Nisarga, *et al.* demonstrated the highest serotype coverage by the 13-valent pneumococcal vaccine which is consistent with the findings of the systematic review [5], and an earlier study from CMC, Vellore [7]. Though the later has shown that a new 15-valent vaccine will cover most of the disease causing serotypes but the vaccine is not yet available.

The current surveillance is a positive attempt towards answering the question on having or not having pneumococcal conjugate vaccines in Indian National immunization schedule? India hopes to see more of these surveys performed on a large-scale, community-based studies from different regions so as to have most precise estimate of the disease to plan the strategy against it. This has rightly been called for by the authors. A countrywide population-based prospective study to understand the disease burden, epidemiology, serotype distribution and also economic burden will more closely aid in recommending a country-specific vaccine.

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