

India launches pneumococcal disease surveillance

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Bangalore: Kempegowda Institute of Medical Sciences (KIMS), Bangalore, announced the launch of India's largest pneumococcal disease (PD) surveillance program. The nationwide program aims to create a robust model for collating and centralizing national data on pneumococcal infections thereby enabling pediatricians to identify drug sensitivity and resistance patterns and also serotype distribution of *Streptococcus pneumoniae*.

A comprehensive data collection and management system program will help to standardize treatment procedures, strengthen epidemiological surveillance, provide data on the disease burden and promote technical expertise in vaccination and prevention activities.

The study involved three hospitals, including KIMS, AIMS Bellur and Vani Vilas Children's Hospital, Bangalore Medical College, in the region of south Bangalore as these three hospitals treat 52 percent of the patients in Bangalore. Over the period of last two years, more than 9,500 samples were collected from south Bangalore to carry out this project.

To combat PD, 30-to-32 of India's leading microbiologists, pediatricians and geriatricians came together from different parts of the country to review the opportunities for driving the pneumococcal surveillance program. This will be the first time that such a robust mechanism will be adopted for the surveillance of an infectious disease in the country, gathering data from 15 centers spread across the country including Ludhiana, New Delhi, Jodhpur, Chennai, Vellore and Hyderabad. The program will allow pediatricians to analyze disease patterns, document information and monitor disease management techniques, which will in turn help strengthen preventive measures for pneumococcal disease.

The pneumococcal disease surveillance program kick-started with a workshop organized to educate doctors about the surveillance mechanism. The participants underwent comprehensive laboratory training on pneumococcal identification, characterization and serotyping. To bolster existing efforts and augment future plans, the expert group will continue to identify knowledge gaps and opportunities to strengthen the surveillance system.

Explaining the pneumococcal surveillance system, Dr K L Ravikumar, professor and head, department of microbiology, KIMS

said, "Data and isolates collected from 15 centers across the country will be archived at KIMS pneumococcal research laboratory. Surveillance for pneumococcal disease will be conducted using a variety of lab based methods and diagnostic tools. Epidemiological surveillance of bacterial pneumonia and meningitis across various age groups will be conducted as per the WHO surveillance guidelines."

"Organisms will be characterized, serotyped and archived for future access up to 30 years to contribute to the research activities. This data will be useful for decision-making for incorporating new vaccines in the national vaccination schedules, to assess the impact of vaccines already used and to provide guidelines for the rational use of antimicrobial drugs." He also added that the study done spanned last three years and it is the first time that there is an active surveillance program was launched for pneumonia.

Explaining the surveillance model, Dr RaviKumar added that "the surveillance model will help identify high risk groups, disease causing serotypes, monitor antibiotics susceptibility patterns, treatment priorities, prevention strategies and will provide information for vaccine development, its effectiveness and its cost benefits. The model will help build awareness on the disease burden to evaluate health impacts and will help policy makers to plan appropriate interventions."

Agreeing with Dr RaviKumar, Dr Nisarga, professor and HOD, Department of Pediatrics, AIMS, Bellur, added that "There are 93 different serotypes (bacteria groups) of *Streptococcus pneumoniae*, however, not all serotypes cause the disease. This is why it is important to know the serotypes causing the disease in India which will help in developing proper preventive strategies including vaccination."

"According to the PneumoNET study conducted in Bangalore certain serotypes such as 6A and 19A are most prevalent. The study which was conducted to identify the most prevalent serotypes in India has reinforced the need for serotyping". He also mentioned that this study had found new serotypes of the *S. pneumoniae* strain such as serotype 3 which was not found earlier in India but was now prevalent in this study. These three serotypes accounted for 28 percent of the infected samples that were received by the group.

According to Dr Premalatha, professor, department of pediatrics, Vani Vilas Children's Hospital, Bangalore Medical College, "This hub-and-spoke model allows for concerted efforts between the central institute KIMS Bangalore and the peripheral hospitals across the 15 centers. These centers will be able to access data that will enable accurate detection and treatment.

Ultimately, prevention, detection and treatment will go a long way in reducing mortality rates due to pneumococcal disease." She highlighted an important point that 44 percent of the isolates present in India are becoming resistant to the commonly prescribed drug in India. Hence there is a need to identify new drugs to combat the bacteria and this could be done through the Surveillance program launched in Bangalore.

Talking about the future of the surveillance program, Dr Ravikumar said that "now we need to think how to take this work forward from Bangalore to other parts of the country because the serotypes prevalent in the south might be different from those in the north. Hence such surveillance programs become a necessity. Currently, there is no place in India, to store the isolates of pneumococci. We plan to collect samples from different centers throughout India, identify drugs that will be useful in combating these isolates, and also store or archive the pneumococci isolates for future reference."

Right now there are only two vaccines available in India: one is by GSK which is 10-valent (i.e. can combat 10 isolates of the strain) and another is by Pfizer which is 13-valent. Dr Ravikumar ended on a positive note that "the vaccine for this disease might soon be included in the national immunization program, hence it is important that we start taking the right steps in identifying those vaccines that will help India to combat this disease."

Pneumococcal disease (PD) has been the leading cause of hospitalization and deaths among the elderly population above 50 years of age and children below five years of age in India. Around 140,000 Indian children succumb to *Streptococcus pneumoniae* every year. As a signatory to the millennium development goals (MDGs) laid down by the WHO, India is committed to reduce the under five mortality to less than 41 per 1,000 live births by 2015 (MDG4).

However, with the current rate of reduction of under five mortality in India (69 in 2008 and 66 in 2009), India may encounter difficulties in achieving the MDG4 goals. To a large extent this is because of the country's inability to reduce infant mortality due to pneumonia and diarrhoea, which are leading causes of child death in India. With a high fatality rate (28 percent) due to PD among adults above 50 years of age, *Streptococcus pneumoniae* has been identified as the most common pathogen accounting for 30-55 percent of cases.