Commentary

Pneumococcal disease in India: The dilemma continues

This issue carries a study by Ravi Kumar et al. on the *Streptococcus pneumoniae* nasopharyngeal carriage in a convenience sample of 190 apparently healthy infants and children. They have also described the antimicrobial sensitivity pattern of the isolated bacteria. There are some methodological limitations in their study (such as small sample size, unclear recruitment criteria, hospital-based enrolment, recruitment of children presenting for vaccination, incomplete description of serotypes searched for, unclear cut-off for penicillin susceptibility, etc.). There are also some flaws in analysis and interpretation. For example, the point-prevalence in the age group 3-12 months (21/96) has been interpreted as 49.2 per cent giving the erroneous impression that there is an inverse correlation between age and pneumococcal carriage. Despite these limitations, the study adds to the Indian literature already available on the subject. Against this backdrop, what additional value does this study provide?

Such a study could have clinical and public health significance since nasopharyngeal colonization with *S. pneumoniae* is an initial step leading to infection and its clinical outcomes. It is also well known now that nasopharyngeal carriage may be associated with acquisition of viral upper respiratory infections. Further, recent data from India also suggest that early colonization at two months of age could be associated with growth faltering (detected at 6 months). If this observation is true (and not merely a statistical artefact), it is possible that *S. pneumoniae* carriage has implications wider than being one of the aetiologies for upper or lower respiratory tract infection.

Given this background, several important issues emerge. First, colonization is not synonymous with infection or invasive disease. Therefore, what could be the cause and mechanism whereby asymptomatic carriage results in clinically important outcomes (including pneumonia, meningitis, growth failure, etc.) in some infants? Second, is there a way to predict which individual infant/child could (or would) experience such adverse outcomes? Third and perhaps more important, unless these aspects are investigated satisfactorily, is it sensible to advocate universal infant pneumococcal vaccination? Fourth, if pneumococcal vaccination is considered an important tool to reduce childhood morbidity/mortality, should the goal be elimination of nasopharyngeal carriage or restricted to reduction in clinically significant disease as envisaged presently?

The latter issues gain importance because much of the current scientific discourse on *S. pneumoniae* is coloured by the hype around available (note emphasis) vaccines. Traditionally, three prongs are used to advocate vaccination, viz. (i) estimated/extrapolated burden of invasive disease, (ii) penicillin (and sometimes other antibiotic) resistance rates, and (iii) nasopharyngeal carriage rate. Kumar et al. have also used their limited data to argue in favour of vaccination along these lines.

Targeting the elimination of nasopharyngeal carriage of vaccine serotypes may not be an appropriate strategy. Among Alaskan infants, vaccination with the 7-valent pneumococcal conjugate vaccine was highly efficacious in reducing invasive disease caused by vaccine serotypes but had limited effectiveness in decreasing disease burden owing to serotype replacement. Serotype replacement and invasive disease caused by the non-vaccine serotypes, have raised significant issues in most developed countries. This raises the additional issues of whether Indian research should focus more on clinical aspects such as identifying infants/children at high(er) risk of adverse outcomes from pneumococcal infection, and managing them; or whether to ‘go with the flow’ and target universal vaccination.

This study also suggests that there is emerging penicillin resistance among pneumococcal isolates. This is an interesting finding because most Indian studies and the recent pan-Asian ANSORP study...
do not corroborate this. It is unclear whether Kumar et al. used the recently prescribed minimum inhibitory concentration break points for penicillin resistance which has resulted in the downward revision of penicillin resistance estimates. However, the more pertinent issue is not merely the potential for emerging penicillin resistance, but the causes thereof. In other words, we need to address rampant antibiotic (mis)use (including the empiric therapy of ‘pneumonia’ recommended by global agencies) and thereby decrease the potential for emergence of antimicrobial resistance.

To summarize, although this study by Kumar and colleagues adds little additional information on pneumococcal carriage, it provides food for thought in various other directions.

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References