Vaccine Preventable Diseases (VPD) and Public Health

The category Vaccine Preventable Diseases (VPDs) has acquired a legitimacy, and is being used to refer to many diseases [1]. This labelling or classification has adversely affected the broader disease control. VPD implies that the rest of diseases are not preventable by vaccines, which may not be true. There are ongoing attempts to create vaccines against dental caries, atherosclerosis, cancer, and many infectious diseases [2,3]. VPD should be correctly referred to as Vaccine Available Disease.

VPD may also imply that these diseases are to be primarily controlled by vaccination. This is against the principle of disease prevention. Disease prevention has been classified into Primordial, Primary, Secondary and Tertiary [4]. The modes of intervention for primary prevention are Health promotion and Specific protection. Health promotion can be achieved by Health education, Environmental modification, Nutritional interventions and Lifestyle and behavioural changes [4]. Health promotion is probably the most ethical, effective, efficient and sustainable approach to achieve good health [5]. Health promotion results in the host being strengthened against all diseases, and results in Positive health, the highest state of health. Vaccination results in specific protection only against a particular disease. Long-lasting and comprehensive disease prevention cannot be achieved by vaccination alone.

Occurrence of a VPD leads to a demand for more vaccination, repeat doses and clamour to punish persons/ children who are not vaccinated. All other aspects of disease prevention are ignored in the panic reaction. No vaccine has 100% efficacy and even the vaccinated can get infected and transmit the infection – albiet for a shorter period than the unvaccinated. Importantly all those who are not vaccinated are not unimmune because of natural exposure to the agent by subclinical infection. Despite these well known facts, there is a tendency to emphasize only on vaccination to prevent VPDs and blame the unvaccinated for disease outbreak.

We should not abandon all principles and tools of epidemiology, immunology, physiology and sociology as soon as a vaccine is created. The goal of public health should be positive health and not merely disease prevention by a single intervention.

PAUL T FRANCIS
Department of Community Medicine,
Amrita Institute of Medical Sciences,
Kochi, India.
paultfrancis@gmail.com

REFERENCES

1. World Health Organization.International Travel and Health – Chapter 6 (Update 2017). Available from: *http://www.who.int/ith/ITH-Chapter6.pdf?ua=1*. Accessed August 31, 2019.
2. Abraham M, Shwetha KN, Vanishri HC, Roopa RS, Dominic A, Sowmya SV. Vaccine for dental caries – An imminent target. JDOR. 2018;14:49-54.
3. Chyu K, Shah P K. In pursuit of an atherosclerosis vaccine chasing the holy grail. Cir Res. 2018:123:1121-3.
4. Park K. Park's Textbook of Preventive and Social Medicine. 25th ed. Jabalpur: M/s Banarsidas Bhanot; 2019
5. Davies M, Macdowall W, editors. Health Promotion Theory. Berkshire: Open University Press; 2006.

Increasing Antimicrobial Resistance in Community-acquired Infections – An Alarming Trend

New resistance mechanisms among antibiotics are spreading worldwide. They are affecting the treatment of common infectious diseases, resulting in adverse clinical outcomes, death and huge consumption of healthcare resources.

Typhoid fever, an endemic disease in India, is a multisystem febrile disease caused primarily by *Salmonella enterica* serovar Typhi (*S.* Typhi). Ceftriaxone resistance has not been very prevalent in India [1], and it continues to be the first choice of drug for the inpatient management of typhoid. However, resistance to ceftriaxone and fluoroquinolone is increasingly being reported in *Salmonella enterica* subspecies from Asia and Africa [2]. During January to June 2019, 19 clinical isolates of *Salmonella* Typhi were isolated from 3696 blood culture specimens, collected from children admitted at Bai Jerbai Wadia Hospital for Children, Mumbai, India. Resistance to ceftriaxone was seen in 14 (73.7%) isolates, while 10 (52.6%) were resistant to fluroquinolones. No resistance was reported towards aztreonam, ceftazidime, colistin, cefepime, doripenem,

imipenem, meropenem, cotrimoxazole, cefoperazone/ sulbactum, ticarcillin/ clavulinic acid and tigecycline.

Penicillin was the standard drug of choice for treating pneumococcal infections for many years until the emergence of resistance to penicillin [3], which compelled the use of alternative antibiotics. Among the 20 microbiologically identified pneumococcal isolates in pediatric patients from our laboratory, cefotaxime and ceftriaxone non-susceptible pneumococci accounted for 5 (25%) cases. Some of these cases also showed levofloxacin resistance (37.5%). Thus, it can be implied that the overall prevalence of resistance to beta-lactam agents amongst pneumococcal species mirrors the rise in resistance documented worldwide [4].

Staphylococcus aureus is an important cause of both community-acquired as well as hospital-associated infections. The incidence of methicillin resistant *S. aureus* (MRSA) varies from 25 per cent in Western part of India to 50 per cent in Southern India [5]. In 175 confirmed cases of infections due to *Staphylococcus aureus*, prevalence of MRSA was 133 (76%). No resistance was reported towards vancomycin, teicoplanin, linezolid and tigecycline. β-lactams are superior for the treatment of MSSA bacteremia and endocarditis. With MRSA isolates being widespread, it is necessary to de-escalate to β-lactams once the cultures reveal a MSSA isolate. Glycopeptides and linezolid need to be used only against MRSA isolates.

In conclusion, high level of resistance to the first line drugs probably reflects their overuse or irrational use in the treatment of unrelated infections. This calls for more studies and mandates a review of first line therapeutic strategies.

GAURAV SALUNKE[1] AND IRA SHAH[2]
[1]Division of Pediatric Microbiology, and
[2]Division of Clinical Infectious Diseases, Department of Pediatric Infectious Diseases, B J Wadia Hospital for Children, Mumbai, India.
[1]drgsalunke@yahoo.com

REFERENCES

1. Sabharwal ER. Ceftriaxone resistance in *Salmonella* Typhi - Myth or a reality! Indian J Pathol Microbiol. 2010;53:389
2. Azmatullah A, Qamar FN, Thaver D, Zaidi AK, Bhutta ZA. Systematic review of the global epidemiology, clinical and laboratory profile of enteric fever. J Glob Health. 2015; 5:020407.
3. Song JH, Jung SI, Ko KS, Kim NY, Son JS, Chang HH, *et al.* High prevalence of antimicrobial resistance among clinical *Streptococcus pneumoniae* isolates in Asia (an ANSORP study). Antimicrob Agents Chemother. 2004;48: 2101-7.
4. Jin P, Wu L, Oftadeh S, Kudinha T, Kong F, Zeng Q. Using a practical molecular capsular serotype prediction strategy to investigate *Streptococcus pneumoniae* serotype distribution and antimicrobial resistance in Chinese local hospitalized children. BMC Pediatr. 2016;16:53.
5. Gopalakrishnan R, Sureshkumar DJ. Changing trends in antimicrobial susceptibility and hospital acquired infections over an 8 year period in a tertiary care hospital in relation to introduction of an infection control programme. J Assoc Physicians India. 2010;58:25-31.

Treatment of Neonatal Seizures: Levetiracetam *vs* Phenobarbitone

We read the recent study by Vykuntaraju, *et al*. [1] with great interest. Phenobarbitone, the currently used first line antiepileptic drug in neonatal seizures, has been associated with increased neuronal apoptosis in animal models and cognitive impairment in humans. This well conducted randomized controlled trial comparing levetiracetam to pheonobarbitone addressed a relevant question. A few queries; however, emerge:

1) Sample size was calculated considering the proportion of outcomes in levetiracetam group to be 77% [2]. However, the reference study [2] had a higher proportion of premature babies, and electrographic seizure resolution was documented, which was not the case in present study [1]. Hence, a larger sample size might have been required. Also, same sample size cannot be used to calculate both safety as well as efficacy, as has been done in this study.
2) Baseline characteristics in both groups demonstrated hypoxic ischemic encephalopathy (HIE) as the predominant etiology; HIE stages, however, have not been specified. HIE stage 2 could show better response than stage 3. Subclassification could have avoided any unintentional bias.
3) Levetiracetam has been approved for use in children aged more than 4 and adults by the US Food and Drug Administration as an adjuvant drug. Hence, neonatal