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Editorial

Infections in the tropics- is the bane of yesteryears waning?



1. The transition: from communicable disease burden to noncommunicable diseases

A total of 56.4 million human beings died in 2015, of which 54% were due to the top 10 causes enlisted in Table 1 [1]. Although infectious diseases were the most significant contributor to morbidity and mortality, the world over, in the pre-antibiotic era; the antibiotic era witnessed a steep reduction in the infectious disease burden. But the control of infectious diseases was notably greater in the developed countries vis-à-vis the developing countries. The developing countries are geographically located in the tropics, where the high temperatures, humid weather, clubbed with the poor sanitation and socio-economic status, lack of adequate medical facilities, provides an ideal breeding ground for the infectious diseases to flourish. Despite the development of antibiotics, the fight between microbes and mankind continued throughout the 20th century into the 21st century, with outbreaks, epidemics and pandemics of infectious diseases occurring even outside the tropics. However, of late, an important aspect that is very disturbing is the emergence of antimicrobial resistance, which is a major concern worldwide, because it threatens to tilt the balance in favour of the microbes bringing to naught the medical achievements which have been hitherto achieved in the control of infectious diseases and in improving the quality as well as the longevity of life.

2. Infections in the tropics: Indian scenario

If we talk of the scene in India, there have been significant advances in the control of infectious diseases. Infections no longer rank as the foremost cause of mortality in India. Diarrhoeal diseases, lower respiratory infections and tuberculosis are the top most infections contributing to death in India. In fact, on the infectious disease front, India reduced polio from 1934 cases in 1998 to 1 case in 2011, and is presently polio-free. However, Acute Diarrhoeal Disorders, Acute Febrile illnesses and acute respiratory infections still rank among the common syndromes of public health importance. Acute encephalitis syndromes (including Japanese encephalitis), Viral haemorrhagic fevers (including Dengue fever), influenza and malaria are important illnesses apart from HIV and tuberculosis. Health care associated infections are also a matter of grave concern, and need to be curtailed.

3. Emergence of newer pathogens

Over 30 new infectious agents have been detected worldwide in the last three decades, and 60 percent of these are zoonosis. In recent years, India has witnessed outbreaks of eight of the emerging and re-emerging diseases, of which six are zoonosis [2,3]. In the last two decades, newly detected microbes of public health importance, first identified in Asia, include Nipah virus (1999), SARS corona virus (2002) caused severe acute respiratory syndrome (SARS), Influenza A-H5N1 caused Avian influenza (2003), Influenza A (H1N1) caused Swine flu (2009) and a novel coronavirus in 2012 caused severe respiratory infection. This issue carries two articles, one on clinical profile of respiratory viral infections in a set-up from South India which suggests that rhinoviruses, influenza viruses and respiratory syncytial viruses were the common agents [4] while the other article describes the influenza A (H1N1) virus outbreak of 2015 in Rajasthan, India [5]. The present issue also carries a study reporting the new fungal strains causing fungaemia isolated in a tertiary set-up in India [6].

4. Old wine new bottle: changing face of old diseases

Apart from the newer strains of microbes which have emerged, notably, the hitherto well-known diseases of the tropics are presenting with unusual manifestations. A glaring example of the latter is 'vivax' malaria, which was considered to be benign, but in the last decade or so, increasingly severe malaria has been conclusively observed in patients suffering from 'vivax' malaria. Clinical features which were only seen with falciparum malaria, viz. renal failure, altered sensorium, seizures, and haematological disturbances, have been observed with 'vivax' malaria cases [7]. A fifth strain of Plasmodium, P. knowlesi has also been recently identified to cause disease in humans [8]. Similarly, this issue carries an interesting report of gall bladder perforation as an unusual complication of enteric fever [9].

Apart from Malaria and Typhoid, viral haemorrhagic fevers like dengue and chikungunya, atypical infections like scrub typhus and leptospirosis, respiratory viral infections like influenza and diarrhoeal disorders are rampant in the tropics. A spectrum of clinical features is witnessed in Dengue and a study [10] of Dengue from the northeast region of India, which is a non-endemic region, is published in this issue. The uncommon features of Dengue fever have been addressed in this issue as well as in a previous issue of

Table 1
Top 10 causes of Death worldwide in 2015.

1	Ischaemic heart disease – 8.76million
2	Stroke – 6.24million
3	Lower respiratory infections – 3.19million
4	Chronic obstructive pulmonary disease – 3.17million
5	Trachea, bronchus, lung cancers – 1.69million
6	Diabetes mellitus – 1.59million
7	Alzheimer disease and other dementias – 1.54million
8	Diarrhoeal diseases 1.39million
9	Tuberculosis 1.37 million
10	Road injury 1.34 million

this journal, highlighting the myriad skin manifestations (generalized cutaneous blanching erythema, palmar erythema, white islands in a sea of red, pruritis [11], the infrequent neurological manifestations viz. encephalopathy, encephalitis and seizures and muscle dysfunction [12,13] and the ocular features, which may be haemorrhagic or inflammatory and can involve both the anterior and the posterior segments of the globe [14]. Dengue fever and Chikungunya have continued to pose health hazards in several urban areas of India and adjoining countries, year after year. Likewise, though once thought to have disappeared from India, outbreaks of scrub typhus have been reported from the length and breadth of India [15].

Systemic fungal infections were considered to be occurring only in immunocompromised patients, but in the last quarter of century, increasingly cases have been reported wherein immunocompetent individuals also suffer from systemic fungal infections, one such case of cryptococcal meningitis is published in this issue [16]. This issue also carries a study [17] on the aetiological agents causing onychomycosis, and concludes that there is a change in the spectrum of its aetiological agents with hyaline hyphomycetes being a common cause of onychomycosis contributing to half of all isolates and the classical dermatophytes contributing to only 15.4% of the isolates. Besides, the study also suggested that the traditional KOH examination should not be solely relied upon for diagnosis, but needs to be supplanted by fungal culture [17].

5. Neglected tropical diseases: Are the diseases neglected, or the human beings?

Leprosy and filariasis are on the verge of eradication, but kala-azar is still proving to be a bottleneck. Drug-resistant kala-azar is a problem in the endemic areas. In fact, kala-azar (visceral leishmaniasis) falls under the rubric of 'Neglected Tropical Diseases' (NTD), the nomenclature assigned by the World Health Organisation (WHO), which has been reviewed with respect to Indian scenario in the present issue [18]. The Global Disease Burden 2010 states that NTDs are the most common afflictions of the world's poor. Of the 17 NTDs enlisted in the year 2011, nine are caused by microparasites and 8 by macroparasites [19]. In 2017, the 10th meeting of the Strategic and Technical Advisory Group for Neglected Tropical Diseases added three diseases to the already existing 17, taking the cumulative total to twenty (Table 2) [20].

6. Immunisation: Do we have newer strategies?

Hepatitis B virus infections are being thwarted by the implementation of universal immunization with HBV vaccine, but the efficacy of hepatitis A, typhoid and Dengue vaccines is far from satisfactory. Effective and affordable vaccines for Malaria and Chikungunya are still being researched. Immunisation coverage has improved in India resulting in reductions in the infant and the under-5 mortality rates, but these effective immunization strategies have resulted in resurgence of infections in the adult

Table 2
List of Neglected Tropical Diseases.

1	Dengue
2	Human dog-mediated rabies
3	Blinding trachoma
4	Endemic treponematoses (yaws)
5	Buruli ulcer
6	Leprosy (Hansen disease)
7	Chagas disease
8	Human African trypanosomiasis (sleeping sickness)
9	Leishmaniasis
10	Cysticercosis
11	Dracunculiasis (Guinea worm disease)
12	Echinococcosis
13	Food-borne trematode infections
14	Lymphatic filariasis
15	Onchocerciasis
16	Schistosomiasis (Bilharziasis)
17	Soil-transmitted helminthiasis (intestinal worms)
18	Chromoblastomycosis and other deep mycoses
19	Scabies and other ectoparasites
20	Snakebite envenomation

populations, especially with diseases like diphtheria and pertussis. This is attributed to the waning of the immunity achieved by vaccination in the childhood, as age advances. This particular issue carries an important review on Maternal immunization [21]. Antenatal immunization is known to be of extreme benefit in several tropical infectious diseases viz. influenza, diphtheria, pertussis; wherein maternal as well as neonatal morbidity can be reduced. Adolescent immunization and adult immunization are other preventive strategies which can prove to be effective in controlling infectious diseases.

7. Tuberculosis: the unbridled horse

Last but not the least, the scourge of tuberculosis continues [22] with the emergence of multi-drug resistant (MDR) and extensively-drug resistant (XDR) strains of tuberculosis. Several articles pertaining to the continual menace of tuberculosis find a place in this issue, dealing with extrapulmonary tuberculosis from north-east India [23], unusual presentation of disseminated tuberculosis as tuberculous cervicitis [24] and utility of polymerase chain reaction (PCR) targeting newer genes for the diagnosis of extrapulmonary tuberculosis [25]. The authors of the latter article surmise that using PCR with multiple targets can help in improving the diagnostic accuracy in cases of extrapulmonary tuberculosis, where most of the times in clinical practice a confirmatory diagnosis remains elusive.

8. Infections: Are they really waning?

Although, the burden posed by infections in the tropics appear to have been controlled, since these no longer occupy the numero uno position in contributing to the mortality, being displaced by noncommunicable diseases. However, it would have been clear to the reader by now that apart from the possibility of entering in to the post-antibiotic era, with the emergence of antimicrobial resistance to most of the antibiotics, the changing face of infections in the tropics poses several challenges to mankind. Newer infections are coming to light, diseases are spreading to newer areas, atypical and uncommon manifestations of infectious diseases are cropping up every day and even immunocompetent persons are developing diseases hitherto seen in immunocompromised persons only. Although the situation may appear to be quite serious and challenging, but there are positives too and the biggest being development of immunization strategies. Irrespective of what the statistics may indicate, the fight against microbes and

infections is on, and human beings have to adopt healthy lifestyle, hygienic practices, and preventive measures because there is no doubt that “Prevention is better than cure”.

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