

The emerging battlefield: Infectious diseases

The age-structure of India's population over the past decade has shown a remarkable trend: while the population under forty – the most economically productive age group – is the largest in the world, India's elderly are projected to become an ever larger share of the population in the future.^[1] As the elderly population (50+) increases, along with that increases the associated health issues. For example, the mean age at diagnosis for diabetes mellitus among adults is 53.8 years.^[2] The projected number of diabetics in India is set to rise to 79.4 million by 2030, and nearly two-thirds of all Type 2 and almost all Type 1 diabetics are expected to develop diabetic retinopathy (DR) over a period of time.^[3] It is evident – India faces an uphill battle against DR. While this has been the writing on the wall for quite some time now, there has been another battlefield for physicians: one, which has very surreptitiously snowballed into a potential global disaster – that of infectious diseases.

In the case of diabetes or hypertension or most other chronic diseases, while our understanding of the pathophysiology has definitely evolved over time, the diseases and their clinical presentation themselves have not changed drastically. However, in the case of infectious diseases – the spectrum of organisms, the modes of transmission, the multitude of presenting features, diagnostic modalities, and treatment – everything has undergone a paradigm shift in recent times. Take for example the case of HIV – in the 1980s, a string of previously rarely encountered opportunistic diseases were being frequently diagnosed in patients who were systemically in poor condition. As baffling as it was, microbiologists and physicians soon were able to connect the dots; researchers were quick to diagnose the offending organism and by the 1990s, highly active antiretroviral therapy was available to those requiring it. Clinicians who had never seen such cases during their training were now seeing, diagnosing, and treating them – constantly learning with every case they treated. Even the Karolinska Institutet which awarded the Nobel Prize in 2008 to the discoverers of HIV noted that “Never before has science and medicine been so quick to discover, identify the origin and provide treatment for a new disease entity.”^[4]

This trend of newer clinical entities caused by infectious agents has continued well into the new millennium. Infectious conditions have always been tougher to diagnose and treat: Clinical features may vary considerably, and no one clinical feature may be pathognomonic of a particular pathogen. In addition, there may be a racial, geographical, and climatic difference in the distribution and type of causative agents associated with infections.^[5]

Coming back to ophthalmology and infectious diseases – in the past few years, many such diseases caused by pathogens have presented with unusual and previously undocumented ophthalmic features. Dengue fever, a viral disease, which has become endemic in certain parts of India has significant ophthalmic findings – subconjunctival, vitreous, and retinal hemorrhages; posterior uveitis; optic neuritis; and maculopathies such as foveolitis, hemorrhage, and edema.^[6] Another vector-borne disease, Chikungunya – a self-limited, systemic viral infection too has many ocular features such as episcleritis, conjunctivitis, keratitis, neuroretinitis, optic neuritis, retinal detachment, and panuveitis.^[7,8]

This brings us to the newest arthropod-borne disease on the horizon – Zika fever. de Paula Freitas *et al.* have reported their findings and have pointed that Zika virus infection is the cause of chorioretinal scarring and possibly other ocular abnormalities in infants with microcephaly recently born in Brazil.^[9] As more cases are reported, the frequency of ocular findings will also increase, and that hopefully will give more clarity to the ophthalmic manifestations of Zika fever. Every new outbreak of a new disease invariably has pathognomonic features in the eye. Ophthalmologists, literally have to be the eyes of the medical fraternity when it comes to newer clinical entities!

As tourism grows and air travel across continents becomes more accessible, geographic limitations no longer can contain the spread of diseases and vectors. As Jampol and Goldstein have said, human and insect travel between continents has resulted in the dissemination of previously remote infections to more populated parts of the world.^[10] We need to rise above our daily clinical practices and limited spheres of influence and see the bigger picture to acknowledge the potential threat that newer diseases like Zika fever could unfold – How do we do that? The first thing is to educate ourselves and understand the disease; speaking to the experts and formulating policies and plans to control the spread of newer vector-borne diseases can follow later. Global collaboration, sharing and pooling resources, increased surveillance, and contingency plans in place are expected from all nations at risk. Are we prepared?

Sundaram Natarajan

Editor, Indian Journal of Ophthalmology, Chairman, Managing Director, Aditya Jyot Eye Hospital Pvt. Ltd.,
Wadala (West), Mumbai, Maharashtra, India.
E-mail: editorjournal@aio.org

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