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Viral Infections: Viral Diseases & New Viruses

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Abstract

In India, infectious diseases continue to be the leading cause of human and animal morbidity and mortality, which results in significant expenditures for healthcare. There have been numerous epidemics and outbreaks of infectious diseases in the nation. However, significant progress has been made in the past in the fight against major epidemic diseases like cholera, malaria, the plague, and leprosy. Unique patterns of viral disease distribution are revealed by the country's vast terrain, extreme geoclimatic differences, and uneven population distribution. With regard to the emergence of infectious diseases, dynamic interactions between biological, sociocultural, and ecological factors, in addition to novel aspects of human-animal interphase, present additional obstacles. Understanding the impact of factors that are necessary for the emergence of infectious diseases and developing strengthened surveillance systems that can reduce human suffering and death are two of the major obstacles that must be overcome in order to control and prevent emerging and re-emerging diseases. The major emerging and re-emerging viral infections of importance to public health that have already been included in the Integrated Disease Surveillance Programme are reviewed in this article.

Keywords: Avian influenza; CCHF; Emerging; India, Nipah virus; Re-emerging; Respiratory viral infections; Rotavirus; Viral diseases; Viral Infections; Hepatitis C virus (HCV); Antiviral treatment

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Introduction

Because specific antiviral treatment is typically unavailable for the majority of viral infections, the traditional methods for the epidemiological control of the majority of viral infections include the isolation of cases, the quarantine of contacts, personal protection through infection control measures, and mass vaccination [1]. The availability of nucleic acid amplification-based rapid diagnostic tests and the development of more potent antiviral medications are rapidly altering this scenario. Common acute viral diseases like respiratory, diarrheal, exanthematous, and neurological infections can coexist and occur as seasonal epidemics that peak in frequency every few years when a sufficient number of young people develop no immune hosts [2]. Arthropod vector activity, such as mosquito breeding during hot rainy seasons, is frequently associated with arboreal disease activity, which is linked to an increased incidence of haemorrhagic fever and neurological diseases in Southeast Asia, such as dengue haemorrhagic fever, West Nile virus, or Japanese encephalitis. Due to specific human behaviours or vertical transmission, numerous chronic blood-borne viral illnesses like the human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV), are still taking significant toll in particular geographic regions. Cancer genesis is also linked to some of these chronic viral infections, including HBV, HCV, HIV, polyomaviruses, and papillomaviruses [3]. After the virus crosses the species barrier from bats or other animals to humans, over 70% of emerging viral infections, including the Ebola virus, the coronavirus that causes the severe acute respiratory syndrome (SARS), and the coronavirus that causes the Middle East respiratory syndrome (MERS), are associated with acute explosive outbreaks.

Nucleic acid amplification tests like real-time or multiplex reverse transcription polymerase chain reaction (RT-PCR) assays are the most important rapid virological tests [4]. These tests are useful for accurate diagnosis and subsequent viral load monitoring during antiviral treatment. Many antiviral medications are now capable of being genotyped using nucleic acid amplification and sequencing to directly detect mutations associated with antiviral resistance in clinical specimens. Antiretroviral medications that

are used to treat HIV infection are also routinely genotyped. In developing regions, nucleic acid amplification tests still have some practical limitations, but they are now routine in most developed countries' hospitals. For clinical and epidemiological decisions, antibody testing by enzyme immunoassay for IgM in acute infection, IgG for exposed individuals' immune status, and the presence of rising antibody titers in paired acute and convalescent sera of symptomatic patients can be useful. In addition, new pathogens have been discovered in the country. Chandipura virus (CHPV), CCHF virus, and KFD virus (KFDV) are examples. Although these viruses were discovered in the 1950s and 1960s, little was known about their pathogenicity or importance to public health. The agricultural and animal husbandry industries suffer greatly from several of these infections [5]. The high costs of medical and intensive care, the loss of productive work days, the impact on travel and tourism, the ban on exporting agricultural produce from affected regions, and other costs indicate that infections of this kind can have a significant financial impact. In the country, the psychological effects of such outbreaks and their repercussions have also not been systematically evaluated.

Viral Transmission and Nosocomial Transmission

Droplet transmission is the most common mode of transmission for respiratory viruses that are important to the public's health, like the influenza a virus. The virus can, by definition, spread within one meter of the index case [6]. On the other hand, when they sneeze, people with influenza a virus can produce as many as 40.000 droplets that are between 0.5 and 12 micrometers in size and expel them at a speed of 100 milliseconds per second. Nuclei of a droplet with a diameter of less than 3 m may float in the air and not fall to the ground. As a result, under certain circumstances, an explosive outbreak with a high rate of clinical attacks may occur as a result of aerosol transmission [7]. 72% of 54 passengers who were kept on the ground for three hours due to a flight delay contracted influenza within 72 hours in a jet airliner without a functioning ventilation system. Influenza virus can be transmitted indirectly through hand contact from a contaminated environment to the pharyngeal mucosa because it can survive on inanimate surfaces for 12 to 48 hours and on hands for 10 to 15 minutes. After inhaling one TCID50 of the influenza a virus, symptomatic influenza may occur. In order to prevent the spread of the influenza a virus, infection control measures in both hospitals and communities always include hand hygiene as a fundamental component. It has been demonstrated that wearing face masks by the index case as source control or by healthcare workers as contacts is equally effective in the control of nosocomial pandemic influenza A H1N1 transmission. When implemented within 36 hours of the index patient's onset of symptoms, hand hygiene and face masks have been shown to prevent influenza virus transmission from household to household. In a secondary school, an outbreak of pandemic influenza A H1N1 was stopped by oseltamivir PEP, but not in nursing homes [8].

There may be opportunities for the transmission of viral infections when vulnerable people with compromised immune systems are institutionalized cared for, such as those receiving cancer chemotherapy or having a solid organ or hematopoietic stem cell transplant, diabetics, elderly people, pregnant women, and preterm babies [9]. Body piercing, tattooing, and acupuncture may increase the likelihood of infection transmission, including hepatitis-C virus (HCV), hepatitis-B virus (HBV), and human immunodeficiency virus (HIV), through the use or sharing of contaminated injection instruments. Dental offices, haemodialysis centers, and other similar facilities also carry significant risks. Where patient care instrument sterilization and disinfection procedures are not strictly followed. There is a real chance that healthcare workers will get HBV, HCV, HIV, rubella, viral haemorrhagic fevers, and encephalitic infections like rabies and Nipah. During the Nipah outbreaks in West Bengal22 and Kerala States, in which a number of healthcare workers were infected, hospital-associated infection transmission was a prominent finding [10].

Conclusion

For the treatment of bacterial, fungal and parasitic infections, routine laboratory diagnostic tests and specific antimicrobial agents are typically available; however, rapid nucleic acid tests and a wider variety of antiviral agents are just beginning to become available. Worldwide, a wide variety of viruses, including respiratory viruses, arthropod-related viruses, and the most lethal blood-borne viruses, cause significant morbidity and mortality. Due to the country's extreme geo-climatic diversity, emerging and re-emerging viral infections pose a constant threat to public health. The country's disease surveillance needs to be strengthened, with an emphasis on disease burden and epidemiology. Additionally, thorough understanding of disease biomics-including vector biology and environmental factors that influence diseases-is urgently required. By focusing on the "one health" approach, emergency preparedness for these diseases and response must also be strengthened. Occasionally, major epidemics are brought on by novel emerging or re-emergence viruses, particularly in densely populated areas where human populations are frequently in close contact with wild animals and food animals. In nations with shaky governance and inadequate health infrastructures, epidemics like the EVD can spread rapidly. Most of these infections do not currently have antiviral treatments. Therefore, effective infection control and vaccination are the most important means of prevention if these viruses are to be contained.

Acknowledgement

None

Conflict of Interest

None

References

1 Simon-Loriere, Etienne Holmes, Edward C (2011) why do RNA viruses recombine? Nat Rev Microbial 9: 617-26.

2 Lawrence CM, Menon S, Eilers BJ, Bothner B, Khayat R, et al. (2009) Structural and functional studies of archaeal viruses. J Biol Chem 284: 12599-603.

3 Cook S, Moureau G, Harbach RE, Mukwaya L, Goodger K, et al. (2009) Isolation of a novel species of flavivirus and a new strain of Culex flavivirus from a natural mosquito population in Uganda. J Gen Virol 90: 2669-78.

4 Stapleford Kenneth A, Miller David J (2010) Role of Cellular Lipids in Positive-Sense RNA virus Replication Complex Assembly and Function. Viruses 2: 1055-68.

5 Murillo A, Vera-Estrella R, Barkla BJ, Méndez E, Arias CF, et al. (2015) Identification of Host Cell Factors Associated with Astrovirus Replication in Caco-2 Cells. J Virol 89: 10359-70.

6 de Villiers EM, Fauquet C, Broker TR, Bernard HU, zur Hausen H, et al. (2004) Classification of papillomaviruses. Virology 324: 17-27.

7 Adams MJ, Carstens EB (2012) Ratification votes on taxonomic proposals to the International Committee on Taxonomy of Viruses. Arch Virol 157: 1411-22.

8 Taylor MP, Kobiler O, Enquist LW (2012) Alphaherpesvirus axon-to-cell spread involves limited virion transmission. PNAS 106: 17046-17051.

9 Koonin EV, Senkevich TG, Dolja VV (2006) the ancient Virus World and evolution of cells. Biology Direct 1: 29.

10 Breitbart M, Rohwer F (2005) Here a virus, there a virus, everywhere the same virus? Trends Microbial 13: 278-84.