

21st Century - A New Era in the Diagnosis of Viral Infections

Editorial

Globalization, new technologies and the genetic evolution of viral pathogens and human stimulate the emergence of new viral threats to health quality. Viral infectious diseases are a continuing threat to humankind, regardless of socioeconomic status, ethnic background, lifestyle, sex and age. They cause suffering and death and impose a financial burden on society. Although some diseases have been conquered by modern advances such as effective drugs and vaccines, new ones are constantly emerging (e.g., human immunodeficiency virus, Lyme disease, West Nile fever, Middle East Respiratory Syndrome and hantavirus pulmonary syndrome), whereas others reemerge in drug-resistant forms (e.g., influenza, HIV, HSV). Because no one knows what new diseases will emerge, the public health system must be prepared for the unexpected. The main aim of this preparing is monitoring viruses in anywhere isolated samples.

Virus discovery during most of the twentieth century followed a classical approach comprising isolation in cell culture or animal models, followed by biological characteristics, morphological classification by electron microscopy and studies of serological properties. In the late twentieth century, advances in nucleic acid sequencing have revolutionized virus discovery by enabling cultivation-independent methods for virus detection and classification. It is now possible to conduct research previously unattainable samples of food, water, soil etc. It was shown that in one sample of water, soil or food may determine viruses of ten different families human virus from 22 of known. These include hepatitis, herpes, gastroenteritis (adenoviruses, astroviruses, rotaviruses, caliciviruses), meningitis, fever, rash, conjunctivitis, HIV, papillomavirus, influenza, etc. Only a few of these viral pathogens have been shown epidemiologically to be transmitted, however a comprehensive analysis of the ecological state of the region (water, soil, plants and animals) are able to give an objective picture of possible outbreaks of viral diseases. Efforts to improve the detection, investigation and reporting of outbreaks at the local and national levels are crucial to understand the environmental factors contributing to these outbreaks.

Future studies are needed to provide valid and reproducible methods for the detection of viral pathogens and correlation between viral contamination of sample and environmental factors. Such information will lead to a better understanding of the health risk related to ecological systems of environmental and to improved methods of its control. Concentration viral antigens from environmental samples and molecular detection of viral pathogens by PCR method can be determined. Comparison genotypic differences between viruses can be used for modeling of the evolution and spread of viruses and to develop new ways to fight with outbreaks of infectious diseases.

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