Influenza and Its Symptoms

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INTRODUCTION

Influenza, also known as "the flu", is an infectious disease caused by the influenza virus [1-3]. Influenza is one of the most prevalent respiratory viruses responsible for annual epidemics as well as occasional pandemics which sometimes have devastating results [4-5]. The virus is classically considered to mainly infect the upper, and sometimes lower respiratory tract, clinically giving rise to upper respiratory symptoms and respiratory diseases [6-10]. In addition to respiratory disease, extra-respiratory complications have been described, including neurological as well as ocular. Furthermore, associations between respiratory viral infections and the development of neuro-inflammatory and neurodegenerative diseases have been found out [11-20].

Influenza viruses are highly contagious and can spread easily in all geographical regions. Although it results show mild symptoms in the majority of cases, illnesses can result in hospitalizations and deaths mainly among high-risk groups who are the very young, elderly or chronically ill patients [21-30].

Classification of Influenza

Influenza is classified into three types

Influenza is an extremely variable, fast-mutating virus. It is basically classified as

Influenza virus A
Influenza virus B and
Influenza virus C

Although these three seems to be related to each other it has different disease characteristics [31-35].

Influenza A: In the early 21st century only we were warned about Influenza virus A. Interspecies transmission of influenza A viruses circulating in wild aquatic birds occasionally results in influenza outbreaks in mammals, including humans [36].

Influenza virus A are of many types, some of the types and their diseases are

H1N1: - Spanish Flu, Swine Flu
H2N2: - Asian Flu
H3N2: - Hong Kong Flu
H5N1: - Bird Flu

As Per antigenicity of Hemagglutinin (HA) and Neuraminidase (NA) molecules Type A is classified into 16 HA subtypes (H1-H16) and 9 NA subtypes (N1-N9) [37-47].
H1N1 Infection causes Acute Respiratory Distress Syndrome (ARDS). H5N1, H1N1 and the novel H7N9 are type A influenza viruses which belongs to the RNA viral family Orthomyxoviridae. Unlike type B and C, Influenza A virus spreads very rapidly and are capable birds and animal infections. Specifically, H5N1 viruses mainly effects the respiratory tract and causes severe pneumonia, lymphopenia, hypercytokinemia and hyperchemokinemia.

The viral RNA polymerase of influenza A virus lacks a proofreading mechanism. Thus, it is able to produce accumulating point mutations, which eventually results in amino acid substitutions. Changes in hamaglutinin and neuraminidase are the most crucial and may affect both the infection rate and the immunogenicity of the viral strain, explaining how influenza virus can cause epidemics year after year producing mild to severe respiratory illness in 30-50 million people.

**Influenza Virus B**

Influenza virus B is a genus in the virus family Orthomyxoviridae. The only species in this genus is called "Influenza B virus. Influenza B is found to infect only humans and seals giving Influenza B. It causes a less severe reaction than Influenza A virus, but occasionally, Influenza B virus can still be extremely harmful. Influenza B does not have classification and do not cause pandemics. The symptoms of Influenza B infections are similar to that of Influenza A. Further diminishing the impact of this virus "in man, influenza B viruses evolve slower than A viruses and faster than C viruses". Influenza virus B mutates at a rate 2 to 3 times low than type A.

The fever, aches, and pains begin to go away on days 2 through 4. But new symptoms occur, including:
- Dry cough
- Increased symptoms that affect breathing
- Runny nose (clear and watery)
- Sneezing
- Sore throat

Most symptoms go away in 4 to 7 days. The cough and tired feeling may last for weeks and sometimes the fever again retreats. Some people may lose their appetite. The flu can make asthma, breathing problems, and other long-term illnesses and conditions worse.

**Influenza virus C**

Influenza C virus is a member of the Orthomyxoviridae, which is characterised by a single segmented RNA genome strand of negative polarity. Whereas, influenza A and B viruses bear eight RNA segments, the genome of influenza C virus bears only seven RNA segments. The two other family members, Thogotovirus and Isavirus, have six and eight RNA segments, respectively.

The generation of recombinant influenza C viruses from seven bi-directional plasmids is an efficient system with regards to virus yield and time spent. Employing certified Vero and MDCK cells, this system is independent of the use of de-embryonated chicken eggs for virus augmentation. Studies on the generation of influenza C viruses with mutations in the nc ends of Polybutylene indicate that base pairing between the viral ends is indispensable for virus rescue, and the exact nature of each nucleotide in the nc regions strongly influences viral titres.

**Technology used in detecting Influenza virus**

**Microarray technology**

Microarray technology is one of the primary evolutions in the field of genome biology in recent years. Microarrays are arrangement of biomolecules on a solid surface like glass slide. Based on the principle of homology, any target material (e.g. RNA, DNA, proteins etc.) can be detected on the basis of suplimentarity/homology with the spotted probes.

**Statistics**

Influenza virus infection or influenza vaccine administration seldom induces ITP. Shizuma summarized 9 reported cases of ITP [2 cases (22.2%) involved children], including Evans syndrome after influenza infection (2 cases) or after influenza vaccine administration (7 cases), and recent definition and current management of ITP. All the 9 reported patients who developed ITP after influenza...
virus infection or influenza vaccine administration were treated with steroids, immunoglobulin, or both. Nonetheless, 1 of 9 cases of ITP, including Evans syndrome, associated with influenza virus infection or influenza vaccine administration died, possibly because of a poor condition at diagnosis. Moreover, 1 of the 8 surviving patients developed chronic ITP,[134-136].

Davidson HA et al., identified 364 patients hospitalized with laboratory-confirmed 2009 H1N1 influenza in Georgia from December 1, 2009 through April 30, 2010. Sixteen patients died prior to survey implementation and were excluded, leaving 348 patients who met our case definition; 146 patients (42%) agreed to participate in the study and were interviewed by telephone. The remaining 202 patients refused or could not be reached. The majority of survey respondents (75%) were over 24 years of age (mean age: 41 years); 78 (53%) were female, and 60% were white and 32% were black. Demographic data from hospitalization records for 133 of the 202 patients who did not participate in the survey indicated that non-respondents were a mean age of 39 years, 49% were female; 36% were white and 50% were black.[137-139].

CONCLUSION

The easiest way to prevent Influenza is to get vaccination each year. The vaccination is to be given only under the supervision of doctor or health care professional. Although vaccination is the mainstay of influenza control and prevention, the average vaccination rate among in Dutch nursing homes is low (20%). Therefore, the use of (a combination of vaccination and) PEP with oseltamivir during an influenza outbreak may play an important role in preventing influenza transmission in nursing homes. By providing social support and education with reliable information about the perceived benefits, efficacy, and safety could raise awareness and improve knowledge of appropriate influenza outbreak interventions and confidence in antivirals among the nursing staff.[140-144]

Future Perspective

Pandemic influenza still remains as one of the most serious threats to global public health. Continuous global vigilance to monitor unfolding ultimatums is crucial. Of the weapons available to control a pandemic, vaccination is potentially the most powerful, but currently there are serious limitations to expedient availability of vaccine supply in an emergency. Many novel influenza vaccines are in evolution, some of which have the possibilities to deliver the huge quantities of vaccine that would be required in a pandemic in a short period of time. However, for the near future, it is likely that the principal vaccine that will be established in a pandemic will be an inactivated egg-derived vaccine of the kind that has been available for several decades. There needs to be a continued focus on improvement to the vaccine response system that will require close association between influenza and vaccine experts, manufacturers, regulators and public health authorities around the world.[145-150]

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