Influenza A and Its Prevention and Control at Home and Abroad

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Abstract: Influenza (influenza) is an acute infectious disease caused by influenza virus infection. Influenza viruses can be classified into three types: (A), B (B) and C. Among them, influenza A virus naturally infects various kinds of mammals, such as birds, human beings, pigs and horses, and has high mortality. Therefore, there is a long way to go to prevent and treat such diseases. At present, the main prevention and treatment measures for influenza A are: isolation, use of antiviral drugs, vaccination against influenza, and the use of traditional Chinese medicine compound preparations.

1. Knowing influenza

1.1 Cold

A cold is a general term for acute inflammation of the nose, nasopharynx or throat, referred to as “cold”, mainly due to diseases caused by viral infections. Common viruses include rhinovirus, adenovirus, coronavirus, coxsackie virus, and parainfluenza virus. A cold can be divided into the common cold and influenza (“flu”).

Common cold: Common cold has an acute onset, mainly caused by a variety of viral infections, with hundreds of different pathogens. Common cold generally does not have fever, no complications, about a week to recover.

Influenza: An acute infectious disease caused by influenza virus infection. Its incidence is more serious, usually in spring, seasonal, periodic. The main clinical symptoms were fever, cough, sore throat, runny nose, general soreness and headache, which were similar to seasonal influenza-like symptoms. A small number of cases are severely ill and progress rapidly, and may present with viral pneumonia, bronchitis, pericarditis, encephalitis, and acute myocarditis. Combined with respiratory failure, multiple organ damage, severe cases can lead to death.

1.2 Flu virus

The flu virus is present in the patient's nose, saliva, and sputum, and is mainly transmitted by air droplets. The population is generally susceptible, and the immunity is not maintained after infection [1]. A pandemic can occur in any season, especially in winter and spring, and the outbreak is sudden and spreads rapidly, and the epidemic is beyond national borders. According to statistics, there have been several major epidemics of influenza in recent times, killing tens of millions of people, and the death toll exceeds the total number of deaths in the First and Second World Wars [2, 3, 4]. Miller [5] and others summarized the five characteristics of influenza pandemic: 1) virus subtype transformation. (2) The mortality rate of young people is high. (3) The pandemic is a wave process with multiple peaks. (4) Infectivity is higher than seasonal influenza. _Significant regional differences. These characteristics provide useful enlightenment for influenza prevention and control.

1.3 Influenza A

Influenza viruses are SSRNA linear single strand negative strand RNA segmented viruses. They belong to orthomyxoviridae. According to the difference of NP and M proteins, influenza viruses can be divided into three types: A, B and C. Among them, influenza A virus naturally infects various kinds of mammals, such as birds, humans, pigs and horses. Influenza A virus can be divided into 15 subtypes according to HA (hemagglutinin) and 9 subtypes according to NA (neuraminidase).

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All human influenza viruses can cause avian influenza. However, not all avian influenza viruses can cause human influenza. Among the avian influenza viruses, H5, H7 and H9 can be transmitted to humans, among which H5 is highly pathogenic. Among these types, H1N1, H5N1 and H7N9 are particularly worthy of attention[6]. The clinical manifestations of humans and birds caused by different subtypes are not identical, as shown in Table 1.

Table 1 The main pathogenic type and clinical manifestations of influenza A virus

Types of	H5N1	H1N1	H7N9
Source	In 1997, it was first isolated from a specimen of influenza deaths from a 3-year-old child in Hong Kong, China.	Since 2009, it has been popular on a global scale. Continued until August 2010.	The new bird flu was first discovered in Shanghai and Anhui at the end of March 2013.
Contagious	The legal infectious disease in the Law on the Prevention and Control of New Infectious Diseases of the Ministry of Health is also known as human infection with highly pathogenic avian influenza. It can be fatal, but so far only 350 people have been confirmed to have died from this virus. Mainly because the H5N1 virus cannot spread from person to person.	It can cause serious diseases, mostly in poultry and pets, and humans rarely appear. However, the spread and variation of mammals, mainly birds and canines, can lead to widespread spread of the epidemic or human influenza. The population is generally susceptible to the flu virus and can be transmitted to humans.	Genetic reassortment from wild birds in East Asia and chickens in Shanghai, Zhejiang, and Jiangsu, China. Infected people are distributed in Beijing, Shanghai, Zhejiang, Jiangsu, Shandong, Anhui, Henan, Fujian, and Taiwan. It has not been confirmed whether such viruses can be transmitted to humans.
Clinical manifestation	Infections are generally mostly critically ill patients. The patient presented with an acute onset and his early performance was similar to that of the common flu. The main manifestation is fever, the body temperature mostly lasts above 39 °C, the heat course is 1 to 7 days, usually 3 to 4 days, which may be accompanied by salivation, nasal congestion, sore throat, headache, muscle aches, cough and general malaise. . Some patients present with digestive symptoms such as nausea, abdominal pain, diarrhea, and watery stools. Severe patients develop rapidly, and can develop pneumonia, pulmonary hemorrhage, acute respiratory distress syndrome, pleural effusion, pancytopenia, renal failure, sepsis, shock, and Reye's syndrome. .	Early symptoms after human infection are similar to those of normal flu. Mainly manifested as fever, cough, runny nose, headache, sore throat, body aches, vomiting and so on. The incubation period is 1 to 7 days, usually 1-3 days. Some patients may deteriorate rapidly, with sudden high fever and body temperature exceeding 38 °C. Secondary to severe pneumonia, pulmonary hemorrhage, acute respiratory distress syndrome, pleural effusion, sepsis, systemic cytopenia, renal failure, shock, Wright's syndrome, respiratory failure, and multiple organ damage. even death.	People infected with this avian influenza have an incubation period of 1 to 7 days, and patients often present with flu-like symptoms. Such as fever, cough, sputum, or accompanied by headache, muscle aches and general malaise. Severe patients develop rapidly, generally manifested as severe pneumonia, and the body temperature lasts more than 39 ° C, usually have difficulty breathing, or accompanied by hemoptysis. It can also rapidly progress to acute respiratory distress syndrome, mediastinal emphysema, sepsis, disturbance of consciousness, shock and acute kidney injury.

In the past, people think that people are not susceptible to avian influenza virus. However, in

recent years, influenza viruses have undergone genetic recombination. Some of the highly pathogenic avian influenza virus subtypes and newly formed avian influenza virus subtypes that have been transmitted between birds have been able to break through the germline. Infect humans [7]. The surface antigen of influenza A virus often mutates, and whenever a new subtype appears, the population lacks immunity to the new virus, often causing a pandemic. As of March 12, 2013, 622 H5N1 avian influenza laboratory confirmed cases have been reported in 15 countries, including 371 deaths, with a mortality rate of 59.65%. The newly discovered subtype H7N9 human avian influenza virus is more covert. Different from the previous characteristics of avian influenza, H7N9 avian influenza virus shows weak toxicity in birds. Birds (chickens) infected with H7N9 will not develop, but only carry the virus. Human H7N9 avian influenza is an acute respiratory infection caused by H7N9 subtype avian influenza virus. From March to June 2013, 133 confirmed cases of H7N9 were reported in more than 10 provinces and municipalities in the mainland of China, of which 43 died, with a mortality rate of 32%. Since the onset of H7N9, a large number of poultry suspected to be infected with H7N9 virus have been killed in Jiangsu, Shanghai, Zhejiang and Anhui, causing huge economic losses, and causing huge losses to the national poultry sales. The poultry industry in Guangdong (including Tianhe District) has been severely damaged by H7N9 alone. Its impact has exceeded that of SARS in 2003 and Avian Influenza in 2004. According to the authoritative investigation by Guangdong Agricultural Department, the sales of poultry in Guangdong Province were only 20% of the normal year, and the direct economic loss reached 2 billion yuan.

2. Prevention and treatment of influenza A

2.1 Major Prevention and Control Measures of Influenza A

At present, the measures to deal with influenza pandemic mainly include the following aspects:

Isolation of sources of infection

Isolation of infected persons and large-scale killing or disinfection of high-risk poultry;

Antiviral drugs for patients

In the past, people think that people are not susceptible to avian influenza virus. However, in recent years, influenza viruses have undergone genetic recombination. Some of the highly pathogenic avian influenza virus subtypes and newly formed avian influenza virus subtypes that have been transmitted between birds have been able to break through the germline. Infect humans [7]. The surface antigen of influenza A virus often mutates, and whenever a new subtype appears, the population lacks immunity to the new virus, often causing a pandemic. As of March 12, 2013, 622 H5N1 avian influenza laboratory confirmed cases have been reported in 15 countries, including 371 deaths, with a mortality rate of 59.65%. In addition, Tamiflu has systemic and local side effects such as allergic reaction, abnormal heart and liver function, gastrointestinal bleeding and itching, dermatitis, etc. Therefore, its clinical use is limited, and it can not be abused at the same time.

1) Influenza vaccination

Because the development of vaccines takes a long time, and influenza viruses mutate quickly, once mutated, the original vaccine will be ineffective. Recently, it has been reported that the United States will begin the H7N9 vaccine human trial, which is expected to be completed in December 2014. After the end, it must be evaluated by an independent panel of experts on a regular basis. However, it is still unknown whether the ideal safety can be achieved. Even if the production is put into the market in the future, it will undergo three phases of clinical verification, so it will take many years before it can be finally determined whether it is safe.

2) Traditional Chinese medicine compound preparation

Traditional Chinese medicine is the use of traditional Chinese medicine in the treatment of viral diseases, not focusing on killing the virus, but mobilizing its own immune mechanism to eliminate the virus. In human body, the system itself is the best medicine for eliminating diseases. When the body is attacked by some kind of “evil qi”, the immune function is inhibited or weakened so that the system itself can not play its function. Traditional Chinese medicine has unique advantages and

broad prospects for the treatment of influenza A. Through syndrome differentiation and treatment, it can improve the immunity of the body and enhance the anti-virus ability from the overall regulation.

2.2 Prevention and Treatment of Influenza A with Traditional Chinese Medicine

There is no name of “influenza” in traditional Chinese medicine, but according to its clinical symptoms, it can be classified into “plague” and “epidemic” categories. Traditional Chinese medicine has a history of more than 5000 years in the prevention and treatment of this kind of disease. Zhang Zhongjing's Treatise on Typhoid Fever in the Eastern Han Dynasty is the earliest monograph on influenza in the world. His theory of six classics of Typhoid Fever is the treatment of symptoms in different stages of influenza. The Sui Dynasty Chao Yuanfang's “On the Origin and Syndrome of Diseases and the Princes of Diseases at Time” records that “people who suffer from illness due to age discord, warmth and cold, and a feeling of perverseness are more susceptible to infection.” It can be seen that Chinese medicine has accumulated a lot of valuable experience in the prevention and treatment of infectious diseases and played a huge role. After 1954, Chinese medicine was formally involved in the treatment of viral infections such as influenza, Japanese encephalitis, viral pneumonia, epidemic hemorrhagic fever, and the rescue treatment of acute infectious diseases of H5N1 avian influenza. In April 2013, the National Health and Family Planning Commission issued the “Human Infection H7N9 Avian Influenza Treatment and Treatment Program (2nd Edition, 2013)”, and also included Chinese medicine in the treatment of human infection with H7N9 avian influenza. In this anti-H7N9 avian influenza rescue treatment, the clinical practice of Chinese medicine in many provinces and cities participating in the treatment of human infection with H7N9 avian influenza has proved that the early intervention of Chinese medicine has been involved in the whole process, and the effect is remarkable. And can significantly improve symptoms, cut off the disease, and reduce the mortality rate [8].

Traditional Chinese medicine is different from Western medicine. The treatment methods of Western medicine are generally various kinds of analysis and various vaccines. The purpose of traditional Chinese medicine is mainly to improve the internal environment and create conditions for the body's immune function. This may be the fundamental difference between the two methods of treatment of viral diseases in Chinese and Western medicine.

For the treatment of influenza virus, you can use Huoxiang Zhengqi San, Xiaoqinglong Decoction and Fuzi Lizhong Decoction (the dose should be large). In the usual use of a large amount of Beibei water, used to drink as usual, drink less herbal tea, not too light. Thereby effectively treating and preventing such diseases.

Comprehensive treatment and prevention experience of ancient and modern Chinese medicine in the treatment of “plague”, “epidemic” H5N1, H7N9 and other severe infectious diseases laid a good foundation for us to develop Chinese medicine compound preparation for the prevention and treatment of influenza A, and provided favorable conditions.

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