



Coronaviruses – new emerging pathogens

Koronavirusi – novoiskrslji, preteći patogeni

The appearance of new coronavirus (CoV) designated 2019-nCoV has opened the new chapter in the research of this group of viruses. 2019-nCoV was identified as the cause of many pneumonia cases in Wuhan, a city in the Hubei Province of China, at the end of 2019. This infection spread across China and other countries and becomes global epidemic. The 2019-nCoV has been officially named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) by the International Committee on Taxonomy of Viruses. It is considered that the virus has genetic similarity to the SARS virus from 2002-3 but there may be differences in disease spectrum and transmission.

Coronaviruses (CoV) are a group of RNA viruses that cause illnesses ranging from the common cold to more severe diseases such as the Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS CoV). They are wide spread among animals (birds and mammals). In certain circumstances, as with the MERS and SARS, animal coronaviruses can evolve and infect people and then spread among them.

Human coronaviruses were first isolated in 1965 from a volunteer with the common cold.

The name “coronavirus” was introduced in 1968. Coronaviruses derive their name from the fact that under electron microscopic examination, each virion is surrounded by a “corona” or halo. This is due to the presence of viral spike peplomers emanating from each proteinaceous envelope. At present, there are six coronaviruses that have been associated with diseases in humans: 229E, OC43, NL63, HKU1, SARS-CoV, MERS-CoV. Coronaviruses are ubiquitous. Although CoV respiratory infections occur primarily in the winter, or early spring, they can occur at any time during the year.

Coronaviruses probably spread in the fashion similar to that of rhinoviruses, via direct contact with infected secretions of large aerosol particles. Reinfection is common. All age groups are affected. Common signs of the CoV infection are fever, cough, shortness of breath, and difficulty in breathing. More severe cases can cause pneumonia, severe acute respiratory syndrome, kidney failure, and even death. The World Health Organization announced that the name of the illness from novel coronavirus is COVID-19, short for coronavirus disease.

Studies in the 1970s and 1980s linked them to as much as one-third of upper respiratory tract infections during winter, 5% to 10% of overall colds in adults, and some proportion of lower respiratory diseases.

Identification of CoV in Serbia was done only during 1980s in Military Medical Academy in Belgrade.

There has long been speculation about association of human CoV with more serious disease (multiple sclerosis, hepatitis or enteric diseases), but none of these early associations has been substantiated.

However, until the pathogen identified as a cause of SARS was isolated, the previously known human CoVs (229E and OC43) were considered to play a marginal clinical role and cause only mild respiratory diseases. The other new CoVs have emerged as a major global health threats since 2002. Namely severe acute respiratory syndrome coronavirus (SARS-CoV) in 2002 spread to 37 countries, and Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012 spread to 27 countries. SARS-CoV caused more than 8,000 infections and 800 deaths, and MERS-CoV infected 2,494 individuals and caused 858 deaths worldwide. Both are zoonotic viruses with similar epidemic characteristics. Symptomatic cases of both viral infections usually present with moderate-to-severe respiratory symptoms that often progress to severe pneumonia. With the occurrence of the SARS, MERS and the new 2019 n-CoV epidemic, CoV may now be considered “emerging pathogens”. Future directions for CoV research include further understanding of the mechanism of replication, elucidation of the molecular determinates of virulence and tropism and immune response, development of vaccine strategies and antiviral therapies.

New research in CoV will provide new insight into this important virus family and perhaps lead to better understanding of the potential of CoV for revival or emergence of other CoV in human population.

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