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RESEARCH ARTICLE

THE NEW CORONAVIRUS FROM THE CHINESE CITY OF WUHAN

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ABSTRACT

A pneumonia outbreak in the Chinese city of Wuhan was reported to WHO on the last day of the year 2019. A new coronavirus (2019-nCoV) was identified a week later. WHO has established the guide for all countries to prepare for the new viral infection. After three weeks, the Chinese authorities confirmed the transmission of the virus from one person to another. Meanwhile, other cases have been reported in Thailand, South Korea, Japan, United States, Russia and Europe. After just over four weeks, the number of people infected is over 20,000 and the victims are 425.

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INTRODUCTION

A new virus from the coronavirus family has been identified as responsible for acute respiratory syndrome which, starting in the Chinese city of Wuhan, is now spreading all over the world (1). The outbreaks of pneumonia began last December particularly in people who had visited the fish market and already on January 9 of this year the genetic sequence of the virus belonging to the same family that had infected thousands of people in 2002-2003 with a mortality of 10% was identified: SARS (Severe Acute Respiratory Syndrome) (2). A month after the official communication to the World Health Organization (WHO), we are faced with the contagion of over 20,000 cases with 425 deaths (Feb 4, 2020).

Transmission from one person to the other was established after three weeks of the report to the WHO and this the passage from Wuhan to Thailand, Hong Kong and South Korea. Experts from the University of Southampton identified the cities and nations to more high risk worldwide for the spread of the new coronavirus (2019-nCoV) (3). After a month the virus has already arrived in all continents from Asia (Taiwan, Japan, Singapore, Malaysia, Vietnam, Nepal, India) to Australia, Saudi Arabia, the Americas (USA, Canada, Mexico) and Europe (France, Germany, Finland and Italy).

Four groups of researchers sequenced the genomes of six different viruses and all of them found that the transmissible

agent is very close to the coronavirus of the SARS. It seems that the virus is spreading faster and hits less severe than the previous SARS coronavirus (4).

On January 12 Chinese researchers shared the genetic sequence of the novel coronavirus with WHO and on January 16 other researchers from the German Center for Infection Research in Berlin had developed a new laboratory assay to detect the novel coronavirus. WHO published a guideline for diagnostic detection (5).

On January 28 the Head of the Virus Identification Laboratory of the Australian Peter Doherty Institute for Infection and Immunity in Melbourne and coworkers announced that they were able to grow the new coronavirus in cell culture, after its isolation with the first person diagnosed with this new infection. Also they will share it with the WHO (6).

The Chinese researchers studied that the genomes of coronaviruses found in Wuhan are related to bat-derived SARS-like viruses. Most patients visited the Huanan seafood market in Wuhan, and the suggestion is that the bats are the possible cause of the new outbreak (7).

Also in France there was the statement of the Pasteur Institute on the identification of the coronavirus and its genetic sequence then communicated and shared with WHO (January 29, 2020).

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Let us now try to establish the etiopathogenesis, that is how and why of the current SARS and above all how we can prevent future epidemic outbreaks. Respiratory syndrome of the Middle East (MERS) helps us understand the entry door of the cells by the virus of both the bat and the camels or of the different animals (civet, ferret, rodents, pigs, dogs, cats, monkeys) to get there then to us humans (8).

"Angiotensin converting enzyme 2" (ACE 2) is the same cell surface receptor used by the virus studied by the scientific group of the Wuhan Institute of Virology. Therefore it is known how the virus depicted the key suitable for opening the keyhole, i.e. the biochemical basis for penetrating the human cell. At least 50 coronaviruses have been isolated in bats (mostly from the intestine) which represent the true reservoir of this viral family.

3% of farmers working in the fields of Yunnan province, Southwest of China, have antibodies to these bat coronaviruses. The meaning is that in this region there is an infection by the aforementioned viruses with a mild disease without clinical signs or causing a respiratory disease that has never been properly diagnosed. This epidemic outbreak has now happened in Southern China.

If then we want to hypothesize that the virus infection was spread due to a clumsy spread from the Wuhan bacteriological research center (technician or researcher infected without his knowledge), then we can fear more about the globalization of the infectious agent for the reasons mentioned above.

If we really think that epidemics and pandemics will emerge again, as happened in this period, it is necessary to deepen the studies on the treatments with monoclonal antibodies or potential vaccines at the cost of a few hundred million dollars. Otherwise we will spend billions of millions of dollars without even thinking of the human lives loss (9).

An efficient method of producing human monoclonal antibodies from memory B cells has demonstrated consistent neutralization of the SARS coronavirus (10). Human monoclonal antibodies as prophylaxis for SARS coronavirus infection have been used in ferrets (11).

The recent success of identifying neutralizing human antibodies (mAbs versus MERS-CoV) suggests the possibility of using these methodologies for a rapid response against emerging viruses with the potential to cause pandemics (12).

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