



View Point

Viruses Jumping Hosts?

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The comprehension of the transmission cycles of Zoonoses is a difficult task as was seen in the case of KFD, which had many obstacles in the process and also involved numerous years of research.

It is believed that the KFD virus got its recognition when it was first encountered by people in 1957. Similarly, SARS-CoV-2 was recognised in 2020. However, unlike the KFD virus which needs a tick for transmission, SARS-CoV-2 can be transmitted from one human to another without any vector as it can spread through aerosols and droplets. Hence its transmission was relatively very easy and faster, which gave rise to the COVID-19 pandemic. Conditions that increase the proximity between humans and animals, may favour the development of zoonoses. It has been observed that a remarkable similarity exists between the symptoms of zoonoses caused by the viruses found in Saudi Arabia and Russia and those of KFD in humans. Some viruses found in bats, pangolins, and other animal hosts have been found to be quite similar to SARS-CoV-2. The origin of SARS-CoV-2 is still unknown to the world. However, the singular probable reason that might have aided the virus to have 'jumped hosts' seems to be the presence of humans and these animals near each other. The veracity of this hypothesis is strengthened by the fact that a market in China where wild animals (inclusive of pangolins and bats) were sold and where many humans could come in contact with them, is assumed to be the source of COVID-19. The cases of bird flu and swine flu also favour this hypothesis.

Kyasanur in Karnataka reported the occurrence of KFD for the first time in 1957. It caused drowsiness, high fever, delirium, and headaches in about 500 people. Due to the dissimilarity of its symptoms with the then-known diseases, typhoid and malaria were not considered during the diagnosis. Yellow fever was considered because of two reasons, firstly, the symptoms were similar, and secondly, majority of the sick people had been to the forest a few days before falling ill. Hence it was assumed that maybe they had fallen prey to the day-biting mosquitoes in the forest that had caused Yellow fever, but the unavailability of such mosquitoes in the nearby forest compelled people to rule out this disease. It was also found that many dead monkeys were seen by the sick people in the forests. When these monkeys were examined, scientists found ticks on them, and on further study of these ticks, they revealed a new species of virus, which proved to be the cause of this



new disease, which was named Kyasanur Forest Disease (KFD), after the village where it first occurred.

Further research explained why KFD did not transmit from one human to another. Generally, when a tick feeds on a human, it takes a complete meal, transmits the virus to the person, and then leaves the human and does not look for any other host to feed on. The infected human can transmit this virus through his/ her blood. Mosquitoes can act as an efficient vector in this case, but surprisingly they do not. Thus this virus can spread from one species to another only through a tick that leaves a species without completing the meal and then feeds on another species. The severity of the disease depends on the species.

A domestic or wild animal, bat, or bird is generally the primary host in the transmission cycle of a virus; an insect (Yellow fever/ KFD) or drops of saliva in the air (bird flu/ swine flu) serve as the vector, and humans serve as secondary hosts.

Viral multiplication and evolution are facilitated by overcrowding. Various new species of viruses were found in a study of numerous species of animals spread across different areas of the world. As of now, it is unknown if these viruses can jump hosts and lead to pandemics.

The enhancing demand for land and food in today's world is causing the reduction of forests and an increase in animal farms. As seen in the past years, this may lead to more pandemics in future. Now that positive Zika cases have recently been reported in India, the situation appears dismal, even for viruses like KFD.