

Role of a veterinarian

in the emerging menace of COVID-19: Need for one health approach

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Coronavirus disease is a cause of global concern. The World Health Organization (WHO) declared COVID-19 as a pandemic situation. The Severe Acute Respiratory Syndrome Coronavirus-2 (SARSCoV-2) is responsible for COVID-19. Animals play varied role in human life in terms of providing food, as companion animals and to maintain ecological balance. The laboratory confirmation of the pet dog, being positive to SARS-CoV-2 in Hong Kong, has shown human-to-animal transmission. In this situation the role of veterinarian assumes an important in treating the animals as well as helping in food security. It is anticipated that the World will triumph over the COVID-19 infection with collaborative, multisectoral, and transdisciplinary approach linking human, animal, and environmental health.

Keywords: COVID-19, SARS-CoV-2, Veterinarian

Introduction

The current global population is going through the worst of its health emergency as every human is either directly or indirectly fighting against the emerging pandemic Corona Virus Disease-2019 (COVID-19). The SARS-CoV-2 infection is not only limited to human, rather spread to different animal species. Although speculations about the origin of this disease has been traced to two different animals: bat and pangolin marking the disease as zoonotic, studies are still underway around the globe to obtain the firm evidence behind the source of virus contraction by human.

CoVs belong to the family *Coronaviridae*, the subfamily *Coronavirinae* and the order *Nidovirales* as per the ICTV. COVID-19 is hypothesized to be originated from the Wuhan's "wet market" (where either live or dead wild animals are sold and slaughtered) in Hubei province, China. After many countries reported of infection due to COVID-19, the WHO declared this as the pandemic situation on March

11, 2020. Looking at the spontaneous surge in cases, the question arises whether veterinarians are to be included in the public health management.

Zoonotic perspective

Bat is the class of mammal which represents the primary reservoir for most of the outbreaks in the last two decades. Bats remained as the natural reservoirs for both SARS-CoV and MERS-CoV, the two high profile human CoV outbreaks in the past. Although the World is still uncertain about the origin of human infection of SARS-CoV-2, significant genetic similarities were claimed to be existing among the CoVs of humans with that of bat and pangolin. Presently, the infection is getting transmitted among the humans via droplet infection. Many researchers also argue for the existence of faeco-oral transmission of the virus as SARS-CoV-2 have been found in faecal samples of patients. The outbreak of SARS-CoV-2 which is already been reported in animals. Unlike the previous outbreaks of

SARS and MERS, SARS-CoV-2 has already been shown to be acquired by many animal species from human interactions.

SARS-CoV-2 anthroponosis (human-to-animal transmission)

The first case of contracting the disease from its owner was a pet dog at Hong Kong, China, on 28 February 2020 and fortunately, after taking proper isolation and quarantine measures the dog tested negative to the Virus Neutralization Test conducted on 12 March 2020.

Results from laboratory experiments concluded that cat is most susceptible to SARS-CoV-2 followed by ferrets. According to OIE, the cats, ferrets and dogs show clinical signs in an order of severe to mild respectively, but there is no observation of any disease symptoms in fruit bats.

After all these spontaneous outbreaks of SARS-CoV-2 in animals, OIE categorized the disease as one of the "emerging diseases" (OIE, 2020). In all the above cases, "direct contact" between human and

animal has been established as the route of disease transmission.

Diagnosis in animal

In all the confirmed veterinary cases of SARS-CoV-2, the samples collected for examination were either vomit, rectal swab, nasal swab (OIE, 2020). Most of the laboratory confirmation was by real-time reverse transcriptase polymerase chain reaction (RT-PCR). Centers for Disease Control and Prevention (CDC, 2020), USA recommends that combination of fever, coughing, difficulty breathing/shortness of breath, lethargy, sneezing, nasal/ocular discharge, vomiting and diarrhoea are the symptoms related to infection with SARS-CoV-2 in pets. CDC directs veterinarians to recommend laboratory testing of animals only after a thorough discussion with state “public health authorities” providing requisite justice to One Health (health of people is connected to the health of animals and our shared environment).

Prevention and Control

Animal-to-animal and animal-to-human transmission of SARS-CoV-2 is not yet established but few cases of human-to-animal transmission are reported in many countries. Therefore, veterinary practitioners either with feverish or other symptoms of COVID-19 should not handle the animal. Appropriate steps of putting donning and doffing of personal protective equipment (PPE) should be followed by the veterinary practitioners and nursing staffs while handling the patient. Strict adherence to biosafety and biosecurity should be followed. Veterinary practitioners who continue working during the pandemic should remain updated with all the guidelines formulated by the animal husbandry department of their respective countries and also the OIE.

Roles and responsibilities of the veterinary profession for public health

Amidst imposing lockdown as a preventive measure to tackle the pandemic, few essential services are still open for the public which also

includes veterinary services. Veterinarians are engaged in the diagnosis, treatment and prevention of diseases in livestock, pet, bird, wild animals etc., in addition to organizing vaccination and deworming camps. Here is a summary of activities where veterinarians can lend their helping hand in fighting COVID-19:

- Veterinary microbiologists and biotechnologists can be recruited in laboratories for human sample collection and their screening.
- Veterinary epidemiologists can suggest surveillance measures from their experiences from several animal epidemics (avian influenza, rinderpest, bluetongue etc.) occurred in the past.
- Clearing the uncertainty and fear of acquiring COVID-19 by animal food consumption along with food processing and inspection. Hence, veterinarians should properly inspect animal food and spread awareness.
- Management of zoo animals and threatened species by veterinarians.
- At the grassroot level, veterinarians can be engaged in advising farmers and for raising livestock and managing farms.
- Beginning with the management of laboratory/experimental animals, developing animal models for virus pathogenesis study to vaccine trials.
- Veterinary researchers can be appointed for human vaccine manufacturing.
- A surge in number of cases of SARS-CoV-2 in animals is well observed and calls for in-depth experiments to develop vaccine for susceptible animals as well.
- Currently many veterinary colleges and research institutes, that are equipped with biosafety level -3 (BSL-3) and real-time PCR machines, are involved in processing and screening human samples for SARS-CoV-2.
- Veterinary vaccine manufacturers and pharmaceutical companies can be considered for production of human vaccines and antiviral drugs.

Role of OIE

- The OIE (World Organisation for Animal Health) coordinates with its regional representatives to gather information and shares with its members. Rumours and unofficial information are also monitored on day today basis.
- The organization mobilizes several technical working groups (*‘ad hoc groups’*) to provide scientific advice on research activities and other implications of COVID-19 on animal health.
- The OIE guides veterinary laboratories working with public health services to support testing of human samples for SARS-CoV-2.
- To develop a longer-term plan with objective of understanding the dynamics and risks involved in wildlife trade and consumption.

Conclusion and prospects

The origin of SARS-CoV-2 infection in human has not been clearly established yet, however human-to-animal transmission has been reported. Many important aspects like food safety, disease diagnosis, prevention of outbreak in human and animals and safeguarding public health etc. play crucial roles in our society. This can only be achieved successfully by including veterinarians in the global health system during this pandemic.

With respect to animal health, companion animals of COVID-19 infected owners should be quarantined and recommended for screening. All zoo keepers should be scanned for the disease before contacting the zoo animals. Veterinary departments should take the responsibility of reporting the confirmed cases of animals to WOA and OIE. To combat this pandemic, the Country’s legislation should act vigorously considering the “One Health” approach to conserve the biodiversity by acting synchronously towards welfare of human and animal health combinedly.

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