

COVID-19: Zoonosis; Public Health and Precautionary Measures

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Abstract: Corona virus has become a most important health concern globally, primarily founded in province of China, Wuhan at the end of the December 2019, influenced community of the largest parts of countries worldwide. In the month of February 2020, World Health Organization (WHO) entitled it as COVID-19. The corona virus pandemic comprises an array of symptoms in individuals' for instance severe pneumonia all along with respiratory disorder, septic shock and multi-organ failure while pandemic also seen asymptomatic as well showing no symptoms for the infection. However, in the end of February 2020, the first case of geriatric Pomeranian dog, a domestic animal was reported positive to COVID-19 or SARS-CoV-2. But in animal cases that were reported positive for COVID-19 showed varied signs. The numbers of animals suffering from COVID-19 are far less than that of humans. Researchers and scientists from all over the world are trying to find the zoonotic potential of COVID-19. No specific treatment is available in the market for COVID-19 in both human and animals but vaccines in humans beings are introduced by several companies. WHO performed an energetic role by putting into practice a lot of principle actions to evade the spread of COVID-19 disease. So, it's time to greatly appreciate for all those who are working in this pandemic for the welfare of humans and animals.

Key words: COVID-19 • Zoonosis • Precautionary Measures

INTRODUCTION

Corona virus has become a most important health concern globally, primarily founded in province of china, Wuhan at the end of the December 2019, influenced community of the largest parts of countries worldwide [1]. In the month of February 2020, World Health Organization (WHO) entitled it as COVID-19 [1]. The corona virus pandemic comprises an array of symptoms in individuals' for instance severe pneumonia all along with respiratory disorder, septic shock and multi-organ failure while pandemic was also seen asymptomatic as well showing no symptoms for the infection [2]. WHO declared the COVID-19 as an emergency issue for the public globally in end of Jan 2020, then it was demonstrated as pandemic in March 2020, with the endeavor of highlighting its consequence to stimulate whole world to take essential actions to avoid the spread of infection [3]. Globally, as of

4:40pm CEST, 29 October 2021, there have been 245, 373, 039 confirmed cases of COVID-19, including 4, 979, 421 deaths, reported to WHO. As of 28 October 2021, a total of 6, 838, 727, 352 vaccine doses have been administered, the virus SARS-CoV-2 that causes COVID-19 also infected small numbers of companion animals internationally. The transfer of SARS-CoV-2 from human to animals can happen infrequently. Animals are not well-known to cooperate in dispersion COVID-19, although people with COVID-19 should keep away from contact with animals [4]. In recent months, diverse reports of SARS-CoV-2 virus or COVID-19 infection in animals that are domestic have become a regular concern for numerous veterinarians along with their customers all over the globe. Most infections of corona virus in companion animals are the basis of predominately gastrointestinal disease with little exceptions as well as infectious bronchitis virus in birds, canine respiratory

Table 1: COVID-19 Cases in Humans; Region Wise 29th October, 2021: [8]

Region	Confirmed Cases	Deaths
Globally	245, 373, 039	4, 979, 421
Americas	93, 368, 055	2, 289, 336
Europe	76, 265, 127	1, 418, 911
South-East Asia	43, 910, 144	691, 521
Eastern Mediterranean	16, 316, 803	300, 406
Western Pacific	9, 365, 369	128, 793
Africa	6, 146, 777	150, 441

coronavirus in dogs and hepatitis virus in mice [5]. The aim of this review is to give an overview regarding pandemic COVID-19, its zoonotic aspects on public health and preventive measurements.

COVID-19 and Zoonosis: There are a few strains of corona virus said by World Organization for Animal Health (OIE) that is zoonotic, however several are not. The infections of CoV are frequent in animals as well as in humans. Zoonotic strains of CoV means they have the ability to transmit between humans and animals, while many other strains are not considered zoonotic [6]. There are corona viruses in different animal species that are responsible for causing a diversity of illnesses. The cattle, pig, cat and dog corona viruses are extremely general that do not cause infection in people. Presently, the well described Canine and feline corona viruses are in flows that are not zoonotic. In human being, CoV infection has become a major concern that causes a variety of illness from very frequent cold to meticulous infections such as Middle East Respiratory Syndrome (resulted by MERS-CoV) and Severe Acute Respiratory Syndrome (originated by SARS-CoV). It is not astonishing that SARS-CoV-2 can transmit a disease to some animals under specific circumstances. The COVID-19 infectivity fallout from person to person spread with a coronavirus identified as SARS CoV-2 [7]. A comprehensive study of SARS-CoV has illustrated its transmission from civets to individuals and MERS-CoV from Arabian camels to persons. Although very small figure of animals together with pets and wild animals have been reported in contrast to humans. Up till now, overall figure of COVID-19 cases and deceases in humans are given in Table 1.

COVID-19 and Animals: Till now, the infection of COVID-19 is broadly disseminated within the population of humans through which there is more chances of animals to get infected when they make contact with infected individuals. There are implications related to the infectivity of animals by means of COVID-19 for the

welfare of animal health and for the conservation of wild life. Many tigers, cats and dogs have resulted positive to COVID-19 virus when they get in touch with infected person [9]. So far, outcome from preliminary studies suggested that there is no vulnerability of poultry and pigs to SARS-CoV-2 disease. Republic of Korea and China have published a few study papers. In these research papers, experiments on animals were performed in which very massive quantity of SARS-CoV-2 were given. After experiment, the study demonstrated the susceptibility of ferrets and cats to illness, dogs are not as much vulnerable while chickens, pigs, dogs and ducks showed resistance to this infection [10]. It is essential to take into account that the study does not impersonate natural infectivity and there were limited species tested. Further studies will help to understand the infectivity of this virus. It won't be astonishing to observe further cases recognized in approaching days. Studies are being investigated for the better understanding of susceptibility of unlike animal variety to the virus of COVID-19 and to evaluate the infectivity dynamics in prone mammal variety. In Figure 1 showed the COVID-19, comparison between the animals and human.

Risk of Infection in Animals: At the end of February 2020, the first case of geriatric Pomeranian dog, a domestic animal resulted positive to the SARS-CoV-2 or COVID-19 virus was reported [11]. Later on, a younger German shepherd that was 2 years old tested positive in the mid of March [12], then at the end of March, another case was reported to COVID-19 in cat by the Hong Kong Government of Special Administrative Region [13] and two pet cats was reported by the United States (April 22, 2020). They all get infected because of the close interaction with their infected holder. In United States, mild respiratory infection was found in two pet cats and both were anticipated to make a complete revitalization while in Hong Kong the pet cat showed no clinical symptoms of illness. Later on, another case of pet cat was found positive to COVID-19 infection due to very intimate contact with its infected owner 27 March, 2020 [14]. All these pet animals in Hong Kong got infection because they were in the custody of their owners who had confirmed COVID-19 infection. In Belgium, samples showing the occurrence of SARS-CoV-2 were composed to evaluate how other illness and situations that are not ruled out can cause those equivalent symbols of infection in case of pet cat but that cat was recovered. Additionally, in US, a Malayan tiger Nadia that was four year-old at the Bronx Zoo was tested positive with medical symptoms of

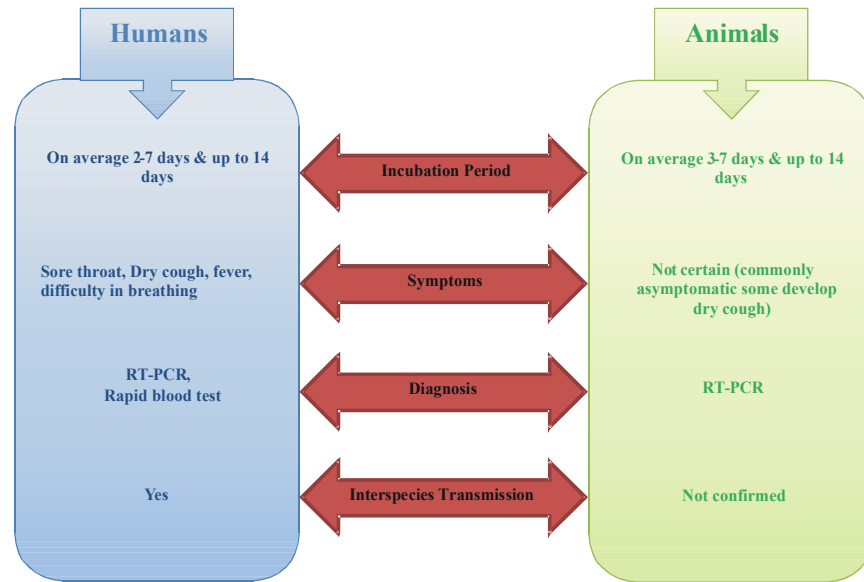


Fig. 1: Comparison; various aspects of COVID-19 between humans and animals

Table 2: Confirmed cases of SARS-CoV-2 in animals in the United State: USDA, APHIS 25th October, 2021 [15]

Animal Species	Method of Initial Diagnosis		Grand Total
	PCR	Ab	
Cat	49	51	100
Dog	30	59	89
Lion	35	-	35
Tiger	29	2	31
Mink Premises*	16	1	17
Gorilla	13	-	13
Snow Leopard	10	-	10
Otter	7	-	7
Fishing Cat	1	-	1
Ferret	1	-	1
Cougar	1	-	1
Coati	1	-	1
Binturong	1	-	1
Total	194	113	307

PCR: Polymerase Chain Reaction for reverse transcription in real time; Ab: Neutralizing Antibody for virus

*Location of some farms is withheld to avoid disclosing data about individual operations

respiratory infection for the subsistence of corona virus [9]. There is incredibly less risk of pet intensifying infection from SARS-CoV-2. The possibility of COVID-19 infection in pets can be further reduced by taking care of our pets like any member of our family by staying them in their residence, quarantine them in the same way as the infected family member to avoid their interaction. USDA gave the actual scenario of SAR-CoV-2 (virus that is

responsible for COVID-19 infection in human population) confirmed cases of animals in United State as shown in the Table 2.

COVID-19 and Pets: We are still not familiar with a lot of things regarding the spread of SARS-CoV-2; however the chief end to recap about the transmission of corona virus from pet animals to human being has no evidence. WHO describes that “the current spread of COVID-19 is a result of human-to-human transmission; to date, there is no evidence that companion animals (dog, cat or any pet can) play a significant role in spreading the disease COVID-19”. There is a need of extensive research to be warranted to understand the factual transmission mechanism involving humans and pets animals [16]. Please consult with a specialist veterinarian in case if your animal/pet has exposed to a COVID-19 infected individual and develop a respiratory infection. They can easily describe the causes of symptoms in pet’s animals in a better way to understand before getting susceptible for COVID-19 infection. Face masks should not be suggested by the holders for pets as masks cannot provide protection to your pet from infection but can cause complexity for breathing [17].

COVID-19 and Precautionary Measures: WHO put into practice quite a lot of standard measures to stay away from the threat of COVID-19 pandemic. Instructions were given to authorities to take preventive actions along with the implementation of SOPS.

Veterinarians and Precautionary Measures: It has been studied that the COVID-19 infection is transmitted through the direct contact of individuals (e.g. when you are surrounded by 6 feet of infected individual) for the duration of 10 minutes at least. Moreover, contaminated surfaces contribute more chances for infection to spread (i.e. someone can contact their face: eyes, nose, mouth after being contaminated by surface), however that is supposed to be a faraway mode of transmission. With the passage of time, the viability of virus on surface decreases. In case of pet animals, if somebody wants to go into its place of living to walk/water/feed from an apartment/house of contaminated COVID-19, they must recommend the following steps to minimize the risk of infection: Centers for Disease Control and Prevention (CDC); [18]

- Always wear clothes and gloves that should be washable
- Carry plastic bags
- Stay away from the touching of surface in the apartment/house
- Place gloves into the plastic bag in case of leaving the house
- Wash your hands and clothes for 20 seconds with soap and sanitize them after attending your pet to go home
- Put your cloth mask while going in public place as it can provide protection to others from your mouth secretions

If Somebody Wants to Take the Pet(s) out of the House [9]:

- Put on easily washable clothes and gloves
- Keep away from touching the surfaces as much as you can in your house
- Use a carrier or leash to put the domestic animals and pet in so that they can safely be taken out
- Place the pets jointly and unapproachable from other pets for 14 days with abundance of precautions
- Clean hands/clothes when you leave your house, always put a cloth mask that will provide protection to other individuals from your mouth and sneezing secretions at public place

COVID-19 Patients and Their Animals: To limit the COVID-19 we have to take safety measures and critical care. The following are some main points;

If Human Is Sick with COVID-19; How Do I Care for My Pet?: WHO and CDC recommended the stay of domestic animals and pets with their owner and limited the close contact of pets with the infected holders. There are imperative advices that should follow for COVID-19 patients existing with their pets: Centers for Disease Control and Prevention (CDC); [19].

- Avoid the use of your personal protecting equipment for example masks or other materials for your pet. This will not provide protection from contact to them and PPE must be preserved for the providers of human health.
- Minimize your interaction with your pet. If possible, then any other members of your family supply essential care to your pet. In case of only individual in house, you can take care of your pets by wearing facemask and wash your hands before and after treating them.
- Rinse your hands with soap before contacting your pets for 20 seconds.
- Evade coughing and sneezing in the way of your pet.
- Keep public distancing to maintain at least distance of 3 feet (1 meter) from one another.
- Avoid intimate interaction together with snuggling, petting, being kissed and giving out food.
- Stay away from expanded contact for instance sleeping or resting collectively in the similar place. MA Covid-19 and Pet Animals.

COVID-19 and Basic Protective Guidance for Public: Authorities made a lot of efforts to persuade individuals to pay attention of their own health and defend others [1, 20, 21].

- Always sanitize your hands with sanitizing gel and wash them regularly with soap
- Wear face mask
- Maintain societal distancing, by remaining a distance of 3 feet connecting yourself to anyone who is infectious
- Avoid touching nose, eyes and mouth
- Following respiratory cleanliness
- Consult to any medical officer in case of facing difficulty in breathing, fever and cough
- Stay in touch and must follow the advices given by your healthcare officer, nationalized and confined public authority of health, or any of your owner.

COVID-19 and Vaccine: Vaccines are being introduced in the World's market against human COVID-19. Till now it is being considered as a best method to remain safe against this deadly pandemic. Although all the human vaccines have been produced at record speed, with processes run in parallel to save time, there have been many checks and balances to ensure their safety, including being subject to the same scientific and regulatory rigor as any other vaccine [22]. A vaccine for canine coronavirus is available but used for the different corona virus strains. Several dogs, for instance, are being vaccinated for a different strains of coronavirus the same as puppies. Yet, these available vaccines fail to provide protection against COVID-19 infection in animals.

CONCLUSIONS

Based on derived information, it can be concluded there are still a lot of things needed to learn from the infection of SARS-CoV-2. So far, there is no evidence available that supports the spread of COVID-19 virus by means of pets and animals to humans. Human infection occurs from the close contact of individuals. Consequently, there is no explanation in intriguing actions in opposition to companion pets and animals that may possibly compromise their safety. We have to wait for new advices and information because of this hurriedly developing circumstance. Additional learning is required to comprehend if and how diverse animals, together with pets, could be pretentious. We must implement preventive measures to keep away from COVID-19 infection as this is merely a best way out up till now.

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