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Increasing zoonotic infectious diseases and COVID-19: Time to rethink wild food

Naveed Akhtar [1], Faheem Nawaz [2], Fiza Bukhari [3]*

1- *Department of Zoology Government Postgraduate College Pattoki (Kasur), Punjab, Pakistan.*
2- *Department of Zoology, University of the Punjab, Lahore, Pakistan.*
3- *Department of Zoology, Faculty of Life Sciences, Concordia College Khudian Khas (Kasur) , Pakistan.*

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ABSTRACT

The third pandemic has hit the globe during the last two decades repeating the zoonotic history of the viral out breaks. The current coronavirus disease-19 (COVID-19) pandemic first experienced from the Wuhan, Hubei, China during the late December 2019 has infected 9742302 people across the world with 492475 casualties till June 26, 2020. Before this, the pandemic of Severe Acute Respiratory Syndrome (SARS) in 2002 and Middle East Respiratory Syndrome (MERS) in 2012 has also adversely affected the humanity. The previous investigations about origin of SARS in 2002-2004 and MERS in 2012 rooted into zoonotic origin caused by bats and camels. The recent nightmare of COVID-19 once again has repeated the history of zoonotic origin and confirmed its origin from bats and pangolins. After 20 years, humanity is facing the music of same zoonotic viral infection as coronavirus adaptability to mutate and acclimatize in new wild hosts. This is mainly attributed to consumption of wild animals like bats, snakes, dogs, civet cats, raccoons and many more without any check globally. It's the time to review the wild food consumption otherwise many such COVID pandemics would hit the humanity in future.

Introduction

Repetition of the zoonotic infectious history

Throughout history, wildlife has been an important source of infectious diseases transmissible to humans. Today, zoonoses with a wildlife reservoir constitute a major public health problem, affecting all continents. The importance of such zoonoses is increasingly recognized, and the need for more attention in this area is being addressed.

The world is facing third coronavirus pandemic outbreak since last two decades i.e. Severe Acute Respiratory Syndrome (SARS) in 2002, Middle East Respiratory Syndrome (MERS) in 2012, and coronavirus disease-19 (COVID-19) in 2019 [1-5], with mega fatalities and bad impacts on economy of world owing to consumption of budget on investigating its origin, transmission, therapy and preventive strategies. Among these, China has experienced the most fatal outbreaks like avian influenza outbreak in 1997, SARS in 2003 [6] and severe fever with thrombocytopenia syndrome (SFTS) in 2010 [7]. Previous findings show the origin of MERS-CoV in dromedary camels [4], SARS-CoV in bats, palm civets, raccoons, dogs [8-10], and COVID-19 in bats and pangolins [11-13].

The outbreak of COVID-19 in Wuhan City, China during December 2019 has shaken the

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* *Corresponding author:* Naveed Akhtar
E-mail address: coordinator.concordiakkc@gmail.com

whole world only in few months owing to rapid worldwide transmission and large number of fatalities. Till June 26, 2020, it has infected 9742302 people across the world with 492475 casualties [5]. Globally, different scientists, researchers, and health agencies are working day and night to prevent further transmission of the SARS-CoV-2 by adopting strict vigilance [14]. Here, the zoonotic aspect of COVID-19 cannot be ignored as it can provide preventive approaches and control strategies for current pandemic and future outbreaks.

Zoonotic origin of the COVID-19

Recently, few reports have tinted the zoonotic links of SARS-CoV-2 and transmission to humans, before gaining it human to human transmission [15-20].The zoonotic aspects of the COVID-19 are linked with the sea food market in the Hunan, Wuhan City in China where different kinds of bats, snakes and marmots were being concerned with the SARS and MERS zoonotic links [21, 22]. This area acted as hotspot for zoonotic link of SARS-CoV-2 to other animals as well as human being due to presence of body fluids of dead animals or air borne transmission leading to appearance of novel pathogens like SARS-CoV-2 and others [23]. The reports of the COVID-19 in animals are also evident from information of the Biscayart et al. [24]. Despite of scientific clarities, many people in different parts of world are consuming wild animals like bats, pangolins, snakes, pigs as food. After zoonotic origin of SARS-CoV-2, new flu that has potential to become pandemic has been identified with origin in pigs [25]. As bats are too used as bush meat and *materia medica*, so we cannot deny bat zoonotic spillover of COVID-19 [26, 27].

Wild food culture and COVID-19

Many of the recent studied described that China with 147 species is considered among most bat rich countries in the world [28-30]. Bats are consumed as source of food in restaurants in China especially in southern China, where bats are sold regularly in markets [28-30]. Fruit bats of genus *Pteropus* are used as bush meat in old world tropics, Asia, Pacific Island, Bangladesh, and in some Western Indian Islands [29]. Bat bush meat is one aspect of contamination. Bats are also consumed for other multiple uses like in medicine for treatment of epilepsy in South America, chest pain and fever in South Asia, night blindness in China, and source of fat [31-32].

Bats have been declared as source of many viruses like Ebolavirus [33]. During the year 2013-2016 epidemic of Ebola, several West African countries has banned bush meat and later on lifted the ban [34]. Different neurological effects have also been reported by eating bats [35]. Recent study of Lam et al. has suggested that group of endangered small pangolins (*Manisjavanica*) could also possess ancestral beta coronavirus related to SARS-CoV-2 [36]. The genome analysis indicates that novel pangolin CoV shares 85-92% nucleotide homology with SARS-CoV-2 [37]. However, the evolutionary pathway of SARS-CoV-2 in bats, pangolins and other mammals remains to be established. We may hypothesize that bats provide more opportunity for emergence of HCVs [38], [39].

Results

After clearance of the earlier facts about origin of coronavirus in bats and recently in pangolin, why the world is not constituting a policy to ban the hunting of bats especially for food as we are already very late. The spillover of a new coronavirus, SARS-CoV-2, is now significant. Originating in bats, current and previous Coronaviruses, such as SARS-CoV and MERS-CoV, are a matter of concern in the interaction between animals and humans, with the future concern of new epidemics in China and abroad. The COVID-19 pandemic and other zoonotic outbreaks by consuming wild animals like bats, dogs, snakes, pangolins, crocodiles and raccoons are global confronts with local origin.

Conclusion and Recommendations

The COVID-19 pandemic and other zoonotic viral outbreaks relating to eating wild animals or mishandling wildlife are global challenges. Without addressing them in a holistic way, the human, social, economic and environmental costs would become unmanageable. Religion can also be an important ingredient in development of wildlife animal trade and consumption policy as narrated in the Torah, the Bible and the Holy Quran.

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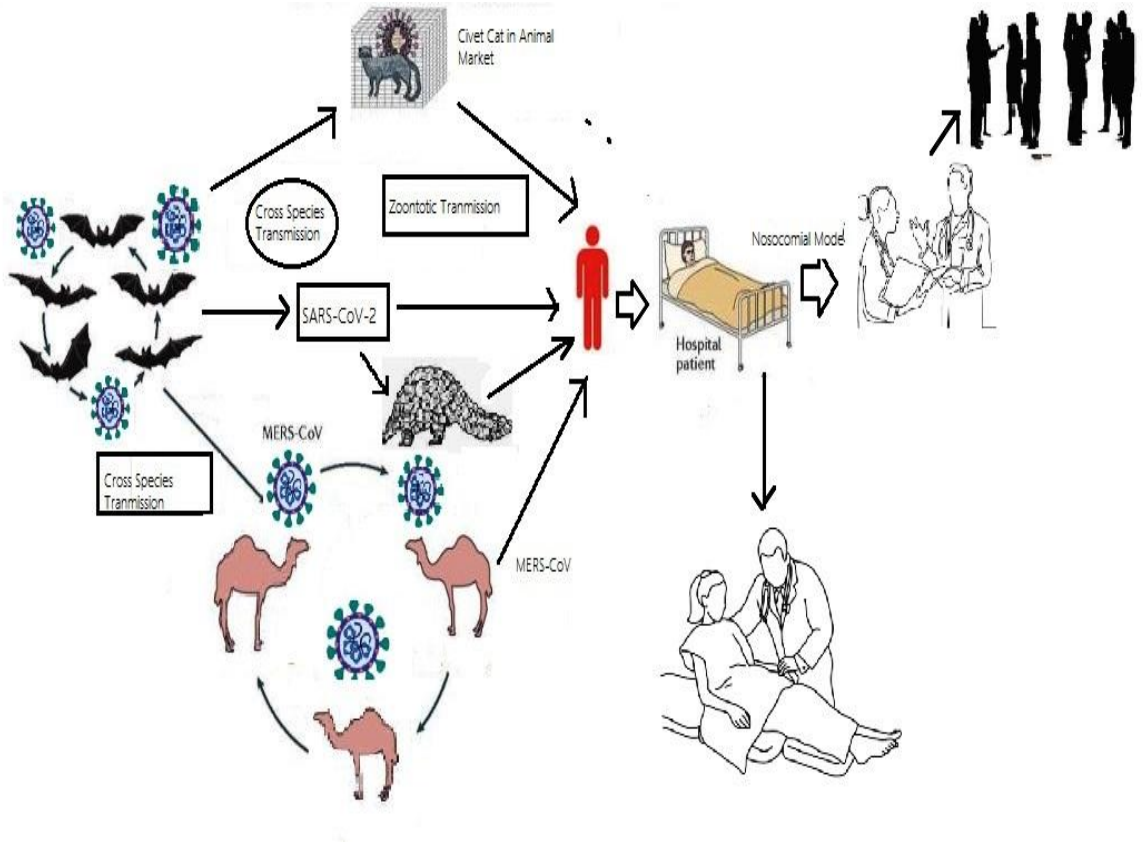
Figure 1. Possible zoonotic transmissions routes of SARS-CoV-2



Conflicts of interest

The authors declare that there are no conflicts of interest.

Authors' contribution

All the authors substantially contributed to the conception, design, analysis, and interpretation of data, checking and approving the final version of the manuscript, and agree to be accountable for its contents.

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