Challenges and Risks Facing Animal Wealth and Human Health Due to Coronavirus Outbreak

Armia N M Ghaly*
Department of Pathology and Clinical Pathology, South Valley University, Egypt

Abstract
Viral mutations are now threatening livestock and human health, and the most important of these viruses in our time is the Coronavirus, influenza virus, and other viruses. The world has come to view this issue with complete concern, is studying continuously its implications for the global economy and the search for the true cause of these viral mutations is it man-made as a kind of biological warfare or by environmental factors. In this paper, we discuss the transmission, epidemiology, clinical manifestation and histopathological examinations of coronavirus infection.

Keywords: Clinical manifestation; Coronavirus; Epidemiology; Mutations; Transmission.

Introduction
Coronaviruses belong to family coronaviridae and classified into α, β, γ and δ coronaviruses. These viruses characterized by its crown appearance due to the presence of glycoprotein spherical particles that resemble spikes as it radiates from virus envelop [1]. β-coronaviruses are one of genera of F.coronaviridae which comprised of “Bovine coronavirus (BCoV)”,”Middle East respiratory syndrome coronavirus (MERS-CoV)”,”Human coronavirus OC43 (HCoV-OC43)” ,”Severe acute respiratory syndrome coronavirus (SARS-CoV)” [2],canine respiratory coronavirus, equine coronavirus, virus porcine hemagglutinating encephalomyelitis virus and mouse hepatitis [3].

BCoV is one of the important viruses that cause a fatal respiratory and intestinal problems and subsequently economic losses [2]. Outbreak of coronaviruses is strongly related to mutation gene that lead to emerging of new serotype with different host range and fatal [3]. It is reported that MERS-CoV and SARS-CoV was originated from Egyptian tomb bats and human infected through dromedary camels and seafood market [4,5]. In addition to zoonotic character of coronaviruses ,the genetic diversity cause emerging new coronavirus in every decade and now a new coronavirus has appeared in Wuhan, China, and the world has become threatened [6].

Transmission and epidemiology of coronavirus
BCoV is transmitted to animals through fecal oral route and in some cases through aerosols of infected animal in addition to that it transmitted horizontally from dam to their offspring [7]. The transmission of other coronaviruses including SARS-CoV and MERS-CoV are not completely understood but infection may be through contact with infected animal , and bats has critical role in this infection [1,4]. On other hand these viruses spread widely either in animal or human population ,causing severe world economic losses through reduced performance, diminish production of animal , boost mortality and high cost of treatment of animal and human [7]. Furthermore, although strict quarantine measure through closing the market and environmental disinfection are more useful ,it cause bring down the movement of buying , selling, importation and exportation [5]. SARS-CoV upheaval during September 2012 was caused global economic losses about $16 billion [1].

Clinical manifestation of coronavirus infection
Animals infected with BCoV exhibited dry cough intermittent, soro to mucopurulent nasal discharge, increased respiratory rate, high temperature, diarrhea and anorexia [8]. Enteritis due to Bcov manifested by presence of mucoid diarrhea yellow to bloody in
color then converted to watery, dehydration, weakness, depression and in the advanced stage in some cases occur coma, and death due to hyperkalemia and acidosis [7]. The clinical sign of CoV infection is similar to that in animal according to [1] who reported that human with MERS-CoV infection displayed that cough, sore throat, myalgia and shortness of breath.

**Histopathological evaluation of animal infected by coronavirus**

Respiratory lesions in animals with coronavirus infection were including mucopululent exudate in trachea, petechial haemorrhages in tracheal mucosa and consolidation of lung cranioventrally. Microscopically, it found that infiltrates of pulmonary interstitium by mononuclear cell causing thickening of interstitium, hyperplasia of the bronchiolar epithelium with desquamation in some parts, lumen of alveoli, bronchi and bronchioles filled with mucin admixed with neutrophils, bronchial collapse with multinucleate epithelial syncytial cells and hyperplasia of the bronchial associated lymphoid tissue [8].

Enteric lesions of coronavirus were including focal hyperplasia of cells of intestinal crypt with cell debris inside crypt lumen, boost inflammatory cells in lamina propria [9], degeneration and necrosis of intestinal epithelium, lumen of the spiral distal colon and rectum may be contain blood clot [7].

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None

**Conflicts of Interest**

The authors declare that they have no conflict of interest.

**References**