

Prevalence of Congo Virus in Pakistan

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ABSTRACT

Congo virus is one of the major issues of livestock in Pakistan, especially during the last decade. It spreads through ticks present on infected animal hide. This virus is zoonotic in nature. It exists mostly in normal humidity. Many cities in Punjab, Pakistan have faced outbreaks because their environment is Congo-loving. It first came in Pakistan in 1976. Its mortality rate is 10 to 40%. It mainly attacks on immune cells of the host. People with poor immune systems are more susceptible. Head and joint pain along with fever are major signs of Congo. Congo virus works to control the processes of the host known as central carbon and energy metabolism. Antibody tests are used to diagnose Congo fever. There is no specific vaccine for the Congo virus. Hence precautionary measures are important.

1. Introduction:

Viruses are acellular infectious particles. Each virus has a specific genome, shape, structure, and binding site [1,2]. Like other viruses, Congo is also an obligate intracellular parasite that has a negative sense of single-strand RNA in its genome. This virus is spherical in shape with an approximate diameter of 80–100 nm [3]. This virus is transmitted from animals to humans through tick bite and from human to human through transfusion of body fluids [4]. Its main contributors are endothelial cells (ECs) and immune system cells. Over the last decade, the outbreak of the Congo virus has increased day by day, especially in Pakistan during festivals.

It was the cause of death in almost 15-20% of people in history [5]. People felt headaches, sore eyes, hyperthermia, dizziness, and neck pain. Anti-viral drugs are mostly used for viral control [6].

2.1 Prevalence:

Congo virus is mainly transmitted by crushing ticks during slaughter or spreading on hands-on animal body surfaces. It also spreads from human to human through blood contact or body-fluid interaction [7]. Main contributors are endothelial cells (ECs) and immune system cells. So, animals are the primary host of Congo and ticks are the intermediate host. When humans contact affected animals, they become secondary hosts. When ticks bite the human body virus spreads through blood and affects immune system cells that provoke an immune response inside the human body.

When the virus enters the blood it reaches the liver, heart, brain, and at last the lungs. It starts damaging the liver during the first week and when it enters the brain it provokes an immune response inside the host, so the patient feels excess fever along with head pain. In this way, it destroys the blood cells of the host which is why it is called hemorrhagic fever [8].

It was first discovered in Pakistan in 1976 city of Rawalpindi, at that time it was not excessively spread. But with the passage of time 14 cases of CCHF were reported between 1976 to 2003 and after this cases and death rates continuously increased. There was a total of 286 cases examined from 2010 to 2014 with a mortality rate of 20-29%. But during the last decade, an alarming increase of Congo virus cases was reported especially from June to September [10]. There were 86 positive cases in 2016 in Quetta with a fertility rate of 41% (highest peak) and 10 deaths were confirmed at that time due to Congo fever. Similarly, in 2017 55 CCHF were caught positive along with a 63% fertility rate. Followed by 63, 75, 19, and 28 in the years 2018, 2019, 2020, and 2021, respectively [11]. In 2022 123 cases along with 25 deaths were reported. Now its fatality is 10-40% in Pakistan.

It was broadly spread during the festival of Eid when many traders came with Congo-affected animals. The virus is zoonotic so both human and animal life are in danger. It was an alarming situation for the Ministry of Health because 63% of the rural population in Pakistan mainly depends upon animals. So, antiviral sprays were used in Pakistan to prevent infection. Unfortunately, there has been no database for affirmation of the exact number of deaths due to CCHF in Pakistan [12].

2.3 Pathogenicity of Congo virus:

Crimean Congo hemorrhagic fever virus (CCHFV) structure consists of a lipid bilayer envelope and an RNA genome divided into three small, medium, and large segments. Its M segment encodes the glycoprotein precursor complex (GPC) that is cleaved by host-cell protease enzyme into multiple mature proteins [11]. When a tick bites on the host skin surface the Congo enters in blood. When the virus enters the host, it causes the release of the virus in blood. The virus that enters the host is mediated through the binding of a glycoprotein envelope. It then spreads in the liver, kidney, and brain of the host. The virus starts replication in liver hepatic cells. So first it destroys the liver. From the liver it travels through blood then it moves towards the

lungs within a week. When it enters the brain, it mixes cerebrospinal fluid and provokes the host immune system through fever [12]. So, then it causes vasoconstriction and the breakdown of blood cells. CCHFV causes vascular leakage either by destruction of endothelial cells or by a disruption of the strongly binding junctions that constitute the endothelial barrier [13]. The genetic activity of the cells showed that the virus is host-specific and prefers hijack processes known as central carbon and energy metabolism. So, Congo virus disturbs this mechanism of the host and stimulates the host's immune, response [14]. Research proves that ticks spread to small animals more than to large animals [15]

2.4 Clinical Manifestation:

Signs that are most common to diagnose the Congo virus in Pakistani people during recent decades are fever, muscle pain, dizziness, neck pain, stiffness, headache, sore eyes, and light sensitivity. Other severe symptoms are nausea, vomiting, diarrhea, abdominal pain, and sore throat early on, followed by sharp mood swings and confusion [14]. People with poor immune systems are more likely to be infected with the virus. According to studies people that had died from the Congo virus had faced other health issues.

Laboratory tests that are mostly used to diagnose CCHF are RT-PCR, immunofluorescence assay (IFA), and ELISA [15].

2.5 Treatment and prevention:

In Pakistan, Congo virus studies need more experimental techniques although, antibody therapy has been used in recent years. Mostly monoclonal antibodies (mAbs) have been considered to be more effective in the treatment of several hemorrhagic fever virus-related infections [16]. Use leather gloves during sampling and hair removal of infected animals consider this to be good in the proper protective shed. You may not jerk ticks and using antiseptic on affected areas with regular washing is effective in preventing infection [17,18].

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