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A Review on Novel Varient Coxsackievirus Related Tomato Flu Malady

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A B S T R A C T

The goal of this article is to present the most recent information about the "tomato flu" outbreak in India. A new disease recently sprung out in some regions of India. The illness had a rash that was primarily seen in children under the age of nine and was extremely contagious. It was called "tomato flu" because the rash was excruciatingly painful and the blisters resembled the size of tiny tomatoes. The TOMATO FLU was the subject of an extensive review of the literature. Children who were impacted displayed a significant rash on their fingertips, toes, mouths, and other regions of their bodies. They suffered a high temperature, throat discomfort, and lesions on their dialect, gums, and cheeks after suffering muscle pain and a fever sickness. None of the kids impacted experienced problems that would have resulted in death. The focus of the treatment was primarily noticeable, therapeutic support in addition to quarantine and maintaining standards of cleanliness. The RNA virus Coxsackievirus A16, one of the members of the Picornaviridae family, has been determined to be the culprit. We arrive to the assumption that a novel variant of Coxsackievirus A16 may be to blame for the recent pandemic of this disease in India.

Keywords: Tomato flu, rash, fever sickness, pain, quarantine, cleanliness, coxsackievirus, picornaviridae, culprit, pandemic, meningoencephalitis, blisters, HEV, HFMD, non-coding,informal,replication and outline.

1. INTRODUCTION:

The first description of hand, foot, and mouth disease (HFMD), a normally benign viral infection of children, was made in 1948[1].Normally cause is unknown. But Coxsackievirus A16 (CV-A16) and human enter virus 71 (EV-A71) are the major pathogens responsible for HFMD[1].As we grapple with the potential appearance of a fourth COVID-19 wave, a new virus named as tomato flu, also known as tomato fever, has been discovered in India's state of Kerala (6th may 2022) in children under the age of five[2,9].

The ailment known as tomato flu, which is causing rashes and flu-like symptoms in youngsters in India, is contagious. The name comes from the tomato-like blisters[7].The early stage of HFMD symptoms encompasses a fever and flu-like symptoms. After that, it forms erythematous areas on the tongue and buccal mucosa, leading to a blister, making it uneasy to chew or drink. It can also cause macular, papular, or vesicular sores on the soles and palms of the hands. Rarely, it can result in meningitis, which may appear with symptoms such as neck pain, light sensitivity, violent throwing up, or meningoencephalitis, which can cause paralysis[2, 7,9].

The cause of "Tomato Flu" has been determined to be CV-A16. As a consequence, the phrase "Tomato Flu" has been discontinued and the clinical features of the disease are explained as an uncommon manifestation of HFMD[1].

2. EPIDEMOLOGY:

By the end of July 2022, 82 cases in Kerala affecting kids below the age of five had been identified, as reported by Lancet Respiratory Medicine. Other North Eastern Indian states, including Tamil Nadu and Odisha, have been impacted by the disease. An additionally 26 cases including children under the age of nine old have been recorded in these states[1,2,6].

The general population is urged to adhere to cleanliness, disinfect their environments, and steer clear of handling an infected person's possessions. Additionally, the federal system places an extreme value on isolation for 5 to 7 days after the start of illness[6,1].

3. ETIOLOGY:

Infections originating from a virus called enter genus, particularly polioviruses, coxsackieviruses, echoviruses, and other entries, are linked to HFMD. The primary cause of HFMD is coxsackie virus A16.It is sometimes confused with the pork, cowhide, and sheep-specific foot-and-mouth disease, which is additionally referred to as hoof-and-mouth disease. Being in contact with the contagious virus, which can be detected in the spit, lesion liquid, nostril and neck fluids, and faeces of those who are contaminated, are the sole means for infection to pass between a single individual to another? The public's

palms, microbes, and touching infected surfaces are the most prevalent methods that the virus is disseminated. The 3 principal ways that a virus called enter distributes are through droplets in the air, exposure to lesion liquids, and interaction with contaminated waste products[1,6,9].

4.COXSACKIEVIRUS A16 VIRAL BIOLOGY:

One of the primary causative reasons for HFMD from the is coxsackievirus A16 (CV-A16). It pertains to the Picornaviridae group & belongs to the Human Enterovirus A (HEV-A) variety of the Enterovirus genus. A one-stranded optimistic logical sense, modified viral RNA that has an icosahedral-like framework, CV-A16 contains around 7400 bases [7]. The entire genome that makes up this a virus called enters is comprised up of a trio of types of regions:

1.non-coding,

2. Fundamental, and

3. Informal

A substantial polyprotein antecedent has been embedded in the coding box (fundamental and informal sections), which is subsequently transformed into structure-specific proteins P1 is the first and informal proteins P2 as well and P3[1,9,11].A virus-encoded enzyme may break down P1 to generate the capsid of the virus component members VP0, VP1, and VP3. VP0 may also be further broken into components that produce VP2 and VP4. While VP4 is situated on the inside of the capsid, VP1, VP2, and VP3 are situated on the exterior. Most of the elimination regions are discovered on VP1 [8]. Rotation proteins 2A, 2B, 2C, 3A, 3B, 3C, and 3D have been identified in the informal regions P2 and P3[1,10,12].

5. VIRUS GROWTH AND REPRODUCTION:

A putative cell receptors for CV-A16 has been found as human scavenger receptor class B, member 2 (hSCARB2). A study showed that in nasally infected hSCARB2 transgenic mice, CV-A16 showed an affinity that targeted lungs and brain tissues rather than tissues of muscles. The virus' genome initially acts as an outline for interpreting, developing the viral polyprotein; beyond this, it serves as an outline for replication. The inside of the ribosome entrance sites (IRESs), that make up nearly all of the 5′UTR and play a role in the start of translation, and the 5′-terminal cloverleaf structure are both fundamentally necessary for these tasks. Although the precise mechanism of CV-A16's viral multiplication has not been thoroughly studied, a study using a newborn rodent model revealed[4,5].

PROCESS OF REPLICATION

- When the binding site links to the tunnel that houses the virus, the virus is sucked upwards into the cell.
- In the cell's cytoplasm, the RNA from the virus gets out,
- and it acts as an outline for interpretation to create the polyprotein
- . Proteolytic digestion of the polyprotein conduces to the release related to structural and informal viral proteins, which undergo processing further to yield capsid amino acids and replication proteins, respectively.
- The virus's replication proteins control viral RNA replication.
- As a result, a negative doubled precursor is created, which is subsequently used as an outline for synthesising positive stranded RNA molecules, which can subsequently proceed through an additional cycle of translation.
- The positive sided RNA is inserted into the virus's coat (7a), which is made up of the coat proteins[1,10].

6. CLINICAL SYMPTOMS:

- The main signs and symptoms of the recent 'Tomato flu' outbreak in India include a high temperature, malnutrition, feeling sick, throwing up, stools, thirst, inflamed joints, and physically unease.
- Scars or excruciating pain in the joints similar to those from influenza and dengue fever typically accompany a severe fever3,4.
- Small red spots begin appearing on the body within a day or two after the onset of the fever; these spots ultimately grow into blisters and corns which subsequently turn into ulcers.
- The lesions tend to develop on the oral cavity, these red, awkward, and perhaps tomato-sized blisters are ulcers12,13,1.
- Flu-like symptoms like coughing, sneezing, rhinorrhea (a runny nose), and colouring of the hands, knees, and buttocks are other indications that you have the "tomato flu2,1."

7. TREATMENT:

- There are at present not any particular antiviral therapies obtainable for HFMD. Yet, many possible antiviral medications are being examined, with a few of them demonstrating extraordinary therapeutic results. Oseltamivir and acyclovir are a couple of these.
- Relaxation, keeping nourished, and consuming natural, purified water have all been recommended to patients. Temperature and discomfort can be treated with acetaminophen or ibuprofen.
- To stop the illness from expanding, everything around us has to be thoroughly sterilised and preserved clean. In addition, given the illness' infectious its very nature, it's crucial to quarantine those who have been diagnosed or suspected for a period of 5 to 7 days following the day symptoms began so as to prevent spreading the illness.
- In order steer clear of infection and swollen expanding, patients are recommended not to remove the blisters.

8.CONCLUSION:

It ultimately emerged that a CV-A16 variety was to blame for the recent "tomato flu" pandemic in India, which was characterised by huge red blisters on the fingers, toes, and thighs. As a result, the misnomer "tomato flu" is not anymore in use, and HFMD is now recognised as the cause of the pandemic. To control the sickness and prevent new incidents, prompt preventive steps such as upholding standards of cleanliness and hygiene and requiring five to seven days of isolation after contracting the illness are critical. Acyclovir and oseltamivir demonstrate efficient advantages by easing symptoms regardless of there are no known antivirals for HFMD. Inflammation can also be treated with NSAIDS.Further investigation is required for more information1,14.

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