

INDIAN TOMATO FLU EPIDEMIC

Shaily joshi*, Dr. Nishkruti Mehta, Dr. Pragnesh Patani

Khyati College Of Pharmacy, Palodia, Ahmedabad

E-mail: shaily.joshi29@gmail.com

Abstract

A brand-new, highly rare virus known as tomato flu or tomato fever has been discovered in the Indian state of Kerala. Concerningly, children under the age of five are commonly affected by the flu. The first flu incidence was recorded in Kerala's Kollam district on May 6, 2022. As of July 26, 2022, there were over 82 children under the age of five who had the virus. There isn't a medicine for tomato flu yet because it's a self-limiting sickness. Tomato flu is extremely contagious, much as other influenza types. To prevent the tomato flu virus outbreak from spreading from Kerala to other parts of India, it is imperative to take the appropriate action.

Keywords : Tomato Flu, Covid-19, Hand Foot and Mouth Disease (HFMD), Enterovirus(EV).

1. Introduction

While we are dealing with the probable appearance of the fourth wave of COVID-19, a new virus known as tomato flu, or tomato fever, has appeared in India in the states of Kerala and Tamil Nadu in children under the age of five.¹ Watchful management is favored to prevent new outbreaks of the uncommon viral illness, which is in an endemic condition and is not believed to be life-threatening, due to the terrible COVID-19 pandemic.²

A medical team is purportedly screening travelers entering Coimbatore for fever, rashes, and other ailments at Walayar on the Tamil Nadu-Kerala border, according to an official source.³ Now that more than 82 cases in Kerala have been connected to the virus, there have been a total of 100 cases related to the tomato flu outbreak. According to K Sudhakar, Karnataka's health minister, there is no need to be alarmed about the pandemic, but there are certain preventative measures that might be taken.⁴

It is sometimes referred to as "tomato flu" or "tomato fever" because to the red, tomato-shaped bullous blisters that develop on the bodies of persons who are unwell.⁵ It is yet uncertain if tomato fever is a viral illness, a side effect of either Chikungunya or Dengue fever, or both.⁶

Adults' body do not contract this virus compared to children's since they have stronger immune systems.^{7,8} Children's tomato flu may not truly be a viral infection, but rather a dengue or chikungunya fever consequence.⁹

**Fig:1 Skin rashes****Fig:2 Red Blisters**

2. Transmission

They proposed that it may be brought on by some odd-sounding illnesses spread by mosquitoes, such as dengue and chikungunya or even chickenpox. The transmission of tomato flu is distinct from that of COVID-19 and is not hazardous, according to experts.⁷

Children are more likely to be exposed to tomato flu since viral illnesses are common in this age range and are more prone to spread via close contact. Young children can catch this virus through using diapers, touching unclean surfaces, and putting things in their mouths directly.

Due to its resemblance to hand, foot, and mouth disease, the tomato flu pandemic in children might have disastrous effects if it is not controlled and avoided. Due to its resemblance to hand, foot, and mouth disease, the tomato flu pandemic in children might have disastrous effects if it is not controlled and avoided.^{10,11}

3. Sign and symptoms

The virus may stay in their system for a few weeks even after the disease's signs and symptoms have subsided.

The tomato flu virus is unrelated to SARS-CoV-2, although having symptoms that are similar to those of COVID-19 (both are initially characterized by a high temperature, tiredness, and body aches, and some COVID-19 patients also report skin rashes). Children's tomato flu may not truly be a viral infection, but rather a dengue or chikungunya fever consequence. It's possible that the virus is a brand-new strain of the infectious disease virus that causes hand, foot, and mouth.^{6,12}

The major symptoms of tomato flu in children are high fever, rashes, and terrible joint pain, which are similar to chikungunya symptoms.¹³ The painful, red blisters that spread widely and finally grew to the size of tomatoes gave the disease its name. These blisters resemble those that children who have the monkey pox virus experience.^{14,15}

Rashes also appear on the skin as a result of tomato flu, causing irritation. Fatigue, nausea, vomiting, diarrhea, runny nose, sneezing, stomach cramps, high temperature, dehydration, swelling of the joints, and body pains are additional symptoms that are similar to those of other viral illnesses. Additionally, some persons express weariness and typical flu-like symptoms, which are comparable to dengue's symptoms.^{3,8,16}

4. Diagnosis

Because the symptoms are fairly similar to those of dengue and COVID-19, patients with these symptoms must undergo a variety of diagnostic investigations. They must submit to a series of

molecular and serological tests in order to be cleared of the dengue, Zika, varicella-zoster, chikungunya, and herpes viruses.¹⁷ Once the possibility of these viruses being present has been ruled out, the tomato flu virus is unmistakably recognized.¹⁸

5. Treatment and Prevention

The tomato flu is very contagious, much as other influenza types. To prevent the tomato flu virus from spreading from Kerala to other parts of India, it is crucial to properly isolate confirmed or suspected patients and implement extra precautionary measures.¹⁰ Isolation should be utilized for 5-7 days following the onset of symptoms to stop the virus from spreading to other kids or adults. Maintaining proper hygiene, sanitizing the nearby environment, and preventing the sick child from sharing toys, clothes, food, or other items with other children who are not sick are the best preventative measures. Wash your hands often with soap and water.^{4,19}

Drug repurposing and immunization are the most efficient and cost-effective ways to protect the population from viral infections, especially in children, the elderly, immunocompromised people, and those with underlying medical disorders. There is presently no antiviral drug or vaccine that can cure or prevent tomato flu. There has to be greater follow-up and monitoring for important outcomes and sequelae in order to better identify the need for prospective therapy. Since tomato flu is a self-limiting condition, no particular medication is available to treat it.²⁰

Children who have the infection should stay hydrated, get lots of rest, and use a hot water sponge. Patients who have itching and rashes will benefit from using a hot water sponge. Similar to the way dengue, hand, foot, and mouth disease, chikungunya, and other diseases of a similar kind are treated, so does this ailment. A patient can use paracetamol treatment and other symptomatic drugs to treat fever and body pains per a doctor's prescription.⁷

6. Epidemiology

Kerala has traditionally seen outbreaks of tomato fever in 2007. At the period, there were several cases of infection in the Kottayam and Pathinamtitla district areas of Mudakayam, Varzur, and Kanirapally that were effected by the Chikungunya virus.²¹

The first instance of tomato flu was recorded in Kerala's Kollam district on May 6, 2022; by July 26, 2022, the local government hospitals had confirmed the illness in more than 82 children under the age of five.²² The other areas in Kerala affected include Anchal, Aryankavu, and Neduvathur. The neighboring states of Karnataka and Tamil Nadu were made aware of this widespread viral illness.²³ 26 children in the state of Odisha, ranging in age from 1 to 9 years, were found to have the ailment, according to the Regional Medical Research Centre in Bhubaneswar. No other regions of India have yet experienced the impacts of the virus, with the exception of Kerala, Tamil Nadu, and Odisha. The Kerala Health Department is taking efforts to track the virus's progress and prevent it from reaching other parts of India.^{10,24,25}

The enteroviruses (EV) Coxsackie A16 (CA16), EV A71, Coxsackie A6, Coxsackie B, and Echo viruses are responsible for the common febrile rash condition known as hand, foot, and mouth disease (HFMD).^{26,27} In recent media reports from the Indian state of Kerala, incidences of "tomato flu"—a febrile rash sickness with round, red skin lesions that resemble tomatoes—in young children have been emphasized. Here, we describe a "tomato flu" case.²⁸

One week after returning from a one-month family vacation to Kerala in May 2022, during which they visited friends and family in several places, a 13-month-old girl and her elder 5-year-old brother both had rashes on their hands and legs.

The local media in Kerala was covering a strange sickness among youngsters known as "tomato fever" during the time of their visit. Although they had played with another youngster who had recently recovered from "tomato flu" a week before coming to the UK, they insisted they had no interaction with ill children.

Both kids experienced a vesicular rash a week after arriving in the UK, with the girl's being more severe (Fig.3 A,B). Fever and any other systemic signs were absent in both children. Even though the boy's lesions had already begun to heal, the daughter experienced severe mouth lesions two days later that resulted in frequent drooling.



Fig.3:- 3-5mm diameter fleshy vesicular lesion on the 13-month-old girl's arms and legs, including the palms and soles (Day 4 of lesions) (A,B). Day 16 of the rash's healing lesions, with minimal to no scarring (C,D).

Both kids went to the pediatric emergency room, where PCR testing on viral swabs from the lesions was done. Clinically, they were stable enough to confine themselves to their homes in the interim.

For EV, both kids had testing. The girl's samples were also examined at a national reference laboratory for monkey pox due to the rash's fleshy vesicular look (Porton Down, Salisbury, UK). Both of the children's EV PCR results were positive, while the girl's monkey pox PCR results were negative. At a different national reference lab (UKHSA-Colindale, London, UK), Cocksackie A16, EV typing by sequencing was carried out.

By Day 6 for the boy and Day 16 for the newborn, the lesions had almost completely vanished with minimal scarring as the two children's wounds continued to heal (Fig.3 C,D).

Partial CA16 sequences from the "Kerala tomato flu" had a most recent common ancestor with a clade from China, according to phylogenetic analyses (2011-2014). These kids had the "Kerala tomato flu," which was brought on by CA16 and CA6, two of the most typical EV causes of HFMD in India.^{29,30} The infant's odd rash pattern first led us to believe that CA6 was the most likely culprit, but monkey pox was also a potential given the ongoing global epidemics. 2103 cases with laboratory confirmation had been reported to the WHO as of June 15, 2022, from 42 member nations in 5 WHO regions. Many cases of monkey pox in the worst-affected nations now report no travel history to endemic areas and no contact with known monkey pox cases due to growing local community transmission. In their everyday practice, doctors on the front lines now need to be aware of these diverse viral rash differentials.³¹

7. Conclusion

Researchers issued a warning about the tomato flu outbreak in India following the rapid development of 82 cases in Kerala. The symptoms of the tomato flu virus are very similar to those of a fever, body aches, rashes, diarrhea, and vomiting. Other viruses also exhibit these symptoms relatively frequently. As a result, patients with this virus must go through many molecular and serological examinations.^{32,33}

The tomato flu virus is present after excluding out other infections. The tomato flu virus cannot be treated specifically. The major care strategy for this tomato flu virus is supportive therapy, which is comparable to the treatment for dengue, chikungunya, and herpes virus. Even though this virus type is only present in a limited portion of Kollam, authorities have issued warnings about the disease's rapid spread.^{34,35}

Kerala has recorded more than 58 hospitalizations and deaths related to food poisoning, which has been identified as tomato flu.³⁶ 26 children have now been confirmed to have contracted tomato flu in Odisha, a state in western India.^{37,38} It is mostly brought on by Coxsackie virus A16.³⁹ According to renowned virologist Dr. Jacob John, Coxsackie A16 and Enterovirus 71 are the two viruses that cause HFMD. Additionally, he mentioned that the first one is milder and spreads more slowly.⁴⁰

Given that India has a large population, early prevention is crucial. Strict action needs to be done. Uncertainty surrounds the pathophysiology of HFMD and tomato fever. In the impacted locations, extensive testing is required. Instead of tomato fever, head foot and mouth disease is the outbreak's primary cause.^{41,42}

The fight against the illness epidemic depends on the public being informed of the issue. Flyers, door-to-door instruction, small-town meetings, and the media may all be used to raise awareness by instructing people on how to recognize flu symptoms and how to treat them. Social media and the news may be utilized to raise awareness. It's crucial to strike balance between spreading important information and fear.^{43,44,45} Travel safety precautions should be observed. With COVID 19 and monkey pox already posing threats to global stability, tomato fever poses an additional danger. Therefore, the extent of the destruction is determined by developing strategic methods to deal with flu epidemics early on. Each of the non-affected states has to have their standard operating procedures ready (SOPs) (Figure 4)

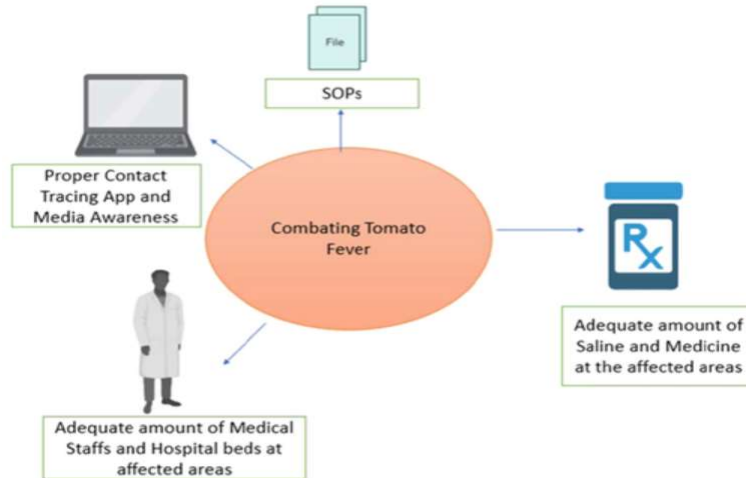


Fig. 4 : The essential recommendations to combat tomato fever in the early stage. SOPs, standard operating procedure

Right now, it's critical to pinpoint the actual cause of this outbreak. It is vital to understand how HFMD and tomato fever are related. Timely measures are crucial if HFMD is determined to be the cause since, according to the CDC, some people who have this condition go on to acquire meningitis.^{46,47} The strategies for both illnesses' prevention, as previously noted, are essentially the same. Since COVID 19 is still active, every new outbreak does have an impact on community mental health, necessitating adequate education and community-based therapy. Additionally, controlling breakouts sooner will undoubtedly benefit the nation's economy. In order to effectively combat the "Tomato flu" outbreak during COVID 19, cooperation between the government, medical professionals, and community is essential.^{48,49,50}

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