



Tomato Flu - A Review on Existing Scenario

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ABSTRACT

Tomato flu is an infectious disease caused by an unexplained virus. The main symptoms of the infection are tomato-shaped blisters all over the body which enlarges to resemble the shape of a tomato, therefore being named as 'Tomato flu'. Most commonly affects children below the age of 5 years. Tomato flu is considered a "Hand, Foot and Mouth disease". The clinical manifestation of most cases is mild. It is a self-limiting infection; which gets resolved on its own in 7-10 days. The diagnosis is based on the clinical history and physical examination, especially in regions where there are outbreaks. This infectious disease etiological agent, its treatment regimen, and vaccination stills remain unknown and is a crucial area of research at present. COVID-19 has taught us lessons for outbreak preparedness and management of cases in emergency conditions by repurposing drugs and vaccines which is also synonymously being tried to curb the condition at present situation.

Keywords: Tomato flu, Hand Foot Mouth disease, COVID-19, Outbreak preparedness.

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INTRODUCTION

Tomato flu is an infectious disease that is caused by an unexplained viral organism detected first in Kerala, India in May 2022. The infection was named 'Tomato flu' due to its main symptom, the tomato-shaped blisters all over the body.^{1,2} The presentation initially starts as a red-coloured small blister which then enlarge to resemble the shape of a tomato, hence the name 'Tomato flu', also synonymously known as 'Tomato fever'.³ It predominantly affects children below the age of 5 years. Strong immunity against the tomato flu virus might be the reason for its low incidence in adults.³ However, adults might act as carriers transmitting the virus while handling the children. Tomato flu is considered to be a "Hand, Foot, and Mouth disease" (HFMD), the common viral infection according to Dr. Amar S Fettle, Epidemiologist and State Nodal Officer of Kerala.⁴ HFMD is caused by viruses that belong to the enterovirus genus such as polioviruses, coxsackie viruses, echo viruses, and other enteroviruses. Coxsackie virus A16 is the most frequent cause of HFMD. Coxsackie virus A16 infection produces only a mild form of the disease in HFMD.^{5,6} Without medical care, almost all

patients recover in about 7 to 10 days.⁶ It is frequently confused with foot-and-mouth disease, also known as hoof-and-mouth disease, which affects cattle, sheep, and swine. The two illnesses, however, are unrelated as they are brought on by different viruses. Infection is transmitted from one person to another by direct contact with the infectious virus, which is present in the saliva, blister fluid, nose and throat secretions, and stool of those who are infected. The virus is most frequently transferred by people's hands, fomites, and by contact with surfaces that have been exposed to the virus. Even though infected people typically show no symptoms in the first week of the sickness, they are most contagious during that time. HFMD is not acquired or spread by animals and most vulnerable age group is young children under five.⁷ Most patients have only minimal clinical characteristics. Since enteroviruses are widespread, adults and older children are likely to be immune. Respiratory droplets, contact with blister fluids, and contact with contaminated faeces are the three main routes that enterovirus is spread.⁸ By avoiding contact with sick individuals and maintaining personal hygiene, the possibility of transmission can be reduced. Adults, including pregnant women, are more susceptible to infection if they have never been exposed to these viruses' protective antibodies. Most enterovirus infections during pregnancy result in mothers having a minor or no illness. There is currently no definite evidence that maternal enterovirus infection can cause untoward pregnancy outcomes such as abortion, stillbirth, or congenital abnormalities. However, mothers who contract the virus just before giving birth may pass it to the



newborn.⁹ The likelihood of infection is higher in a newborn whose mother is experiencing enterovirus disease symptoms at the time of birth. The majority of new-borns who contract an enterovirus have a minor illness, but in rare circumstances, they may develop a serious infection in several vital organs, including the liver and heart, and could die as a result of the infection.^{10, 11} However, researchers are still looking into the precise etiological factor that is causing this infection.

Epidemiology

The disease outbreak started in the Kollam district of Kerala where around 82 cases of Tomato flu have been reported till May 13, 2022, and the numbers are expected to go up further. A four-year-old child from Aryankavu, a village near the Kerala-Tamil Nadu border is the first case of Tomato flu which was reported on May 6, 2022.¹² Since then, 26 cases were found to be positive for Hand, Foot and Mouth disease in Orissa which is presumed to be Tomato flu.¹³

Clinical Features

Tomato flu is considered the aftermath of chikungunya or dengue infection due to the similarity of their symptoms, though their correlation has not yet been proved.¹⁴ The common presenting symptoms that have been identified so far are as follows:

- Large, spherical, reddish blisters on multiple parts of the body
- High-grade fever
- Dehydration
- Skin rash and skin irritation
- Myalgia
- Swollen and painful joints
- Other uncommon symptoms are:
 - Nausea and vomiting,
 - Running nose,
 - Sneezing,
 - Frequent coughs,
 - Patches and discoloration on various body parts including hands, buttocks and knees,
 - Abdominal pain and cramps,
 - Feeling of tiredness,
 - Fatigue.

Tomato flu does not cause any serious illness. Complications are rare with the disease.³

Management of Tomato Flu

Tomato flu is a self-limiting viral fever. Hence, it usually gets resolved on its own in approximately 7-10 days.⁶ The disease is diagnosed clinically by history and physical

examination, especially in regions where there are outbreaks.

Treatment

Tomato flu being a rare infectious disease and with its recent emergence, no specific drugs are available now to treat this virus. Owing to the unavailability of disease-specific treatment, only the symptoms are managed like any other flu with antipyretics and analgesics accordingly. Ibuprofen or Acetaminophen can be used to treat the fever. Antibiotics are of no use unless the skin blisters become purulent. A lot of fluid intake in the form of water, juice, or milk is encouraged as dehydration is commonly seen. Bed rest is recommended along with proper hygiene and sanitation should be maintained. Affected children should be isolated for five to seven days.¹⁵

Outbreak Preparedness

If a child displays any HFMD symptoms, parents are encouraged to consult a doctor as soon as possible. They should also be vigilant to any deviation from their child's usual behaviour, such as a refusal to eat or drink or persistent vomiting or drowsiness.

- All children and adults should wash their hands regularly and thoroughly, especially after changing diapers or using the toilet.
 - Using a diluted solution of chlorine-containing bleach, contaminated objects and surfaces should be thoroughly cleaned and disinfected.
 - By enhancing disease surveillance, a case definition will be developed to aid in the early identification of severe cases as well as the reporting, monitoring, and treatment of such patients.
- Development of an HFMD reporting protocol and daily HFMD reporting at every level of health care facilities are essential.
- Foundation or expansion of facilities for paediatric intensive care units (ICUs).
 - ICU staff training programs should be organized.
 - Establishing a specialized medical team and providing round-the-clock on-duty service.
 - Surveillance and evaluation of severe cases based on clinical signs should be improved.
 - Clinical surveillance for early detection of severe cases and prompt intervention should be provided to reduce mortality.
 - To prevent cross-transmission among other sick children, consultation rooms for febrile rash cases should be set up in fever outpatient clinics or paediatric wards. For each patient, medical equipment needs to be sterilized.

Preventive Measures

Prevention plays a vital role during the sudden outbreak of an unknown infection. If preventive measures are followed



strictly by each individual, the impact of an outbreak can be controlled easily. However, since Tomato flu commonly affects children less than 5 years of age, compliance with preventive measures is uncertain. It is the responsibility of their caretakers to be vigilant during disease outbreaks. The following are some of the preventive measures that should be followed to prevent tomato flu:¹⁶

1. Since it can spread rapidly from one person to another, infected persons must be isolated for at least 5 to 7 days.
2. Tomato flu being a highly contagious infection, patients should be advised not to scratch the skin blisters. Since it commonly affects children, preventing them from scratching the infectious blisters is critical.
3. Close contact with infected individuals should be avoided. Children should be advised not to touch or hug those children who have fever or rash.
4. Practicing good hygiene and proper sanitation are good defences against the disease. Children should be thought about these practices.
5. Clothes, utensils and other materials used by the patients should be sterilized properly and regularly.
6. Keep the children well hydrated.
7. A well-balanced diet should be followed regularly which helps to maintain good immunity.
8. If any of the family members become symptomatic, they should be isolated immediately and should consult a doctor.

Drugs and Vaccines Under Trial

Tomato flu is a newly emerging infectious disease, hence drugs for the treatment and vaccines are yet to be developed or yet to undergo clinical trials.

Steps taken by the government

In response to cases of tomato flu being discovered in Kerala, Tamil Nadu, the neighbouring state, has increased its border surveillance. Initiatives were started by the Kerala government in all Anganwadi and medical centres to treat the affected individuals.¹⁷

Anganwadi centres in Coimbatore are conducting disease screenings, and 24 mobile teams with health professionals have reportedly been deployed.¹⁸ Three teams made up of revenue inspectors, health inspectors, and police have been deployed in shifts to keep a watch for anyone with fever and rashes.¹⁸ Since majority of the cases are from Kerala the neighbouring regions are kept on a close watch.¹⁹ Outpatient departments of all the hospitals in the neighbour states are instructed to report those presenting with the symptoms of tomato flu.¹⁹

CONCLUSION

Tomato flu cases were detected during the time when there an increasing tension of the outbreak of Monkey pox across the country. Though it is spreading rapidly,

immediate actions taken by the government towards prevention and treatment has limited the infection spread to a large extent.

Declarations & Limitations

Being an emerging disease, and lack of concrete evidence regarding the etiological agent and pathogenesis of the disease condition, the article has been synthesized based on the evidence and reports available online at present situation. Further close follow up of the cases and research can help to generate more evidence regarding this atypical disease.

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