

Original Research:



Awareness Survey, Safety Measures and Precautions to Combat Tomato Fever- A Prospective Observational Study

Dr. Prolay Paul¹, Dr. Rajesh Nath², Dr. Sobhan Gupta³

¹Doctor of Pharmacy, PDPHM (Professional Diploma In Public Health Management), Six Sigma: Black Belt Certified, Clinical Pharmacology- Head; Narayana Superspeciality Hospital, Howrah, West Bengal

²Doctor of Pharmacy, Clinical Pharmacologist Intern - Narayana Superspeciality Hospital, Howrah, West Bengal.

³(Doctor of Pharmacy), Clinical Pharmacologist Intern - Narayana Superspeciality Hospital, Howrah, West Bengal. Member of Sanjeevani NGO.

Abstract:

Background: - A Prospective study was carried out through survey to make sure people were aware of the ongoing endemic tomato flu among children under the of 5 years. To take precaution and break the chain with infected patients.

Objective: - To create awareness among targeted population.

Design: - Survey analysis from prospective cohort studies.

Participants: - Healthcare workers, Medical students and others.

Key Words: - Tomato Flu, Head foot mouth disease (HFMD), Children, Cocksackie virus A16, Enterovirus.

Introduction:-

A new viral flu called tomato fever is in for the past. The condition is known as "tomato flu" or "tomato fever" because of the reddish bullous blisters shaped like tomatoes that appear on the bodies of those who are infected.^{1,2} Fever, exhaustion, rashes, irritability, red skin blisters, and dehydration are some of the symptoms of the flu.^{3,4} Even after the disease's signs and symptoms have diminished, the virus may continue to exist in their system for many weeks.^{5,6} Head foot mouth disease (HFMD) rather than tomato fever is the likely source of this outbreak. It is mostly brought on by Cocksackie virus A16.^{7,8} According to renowned virologist Dr. Jacob John, Cocksackie A16 and Enterovirus 71 are the two viruses that cause HFMD. Additionally, he mentioned that the first one is milder and spreads more slowly.⁹ Skin rash on the palms of the hands and soles of the feet, dehydration brought on by mouth sores, and fever are the typical signs of HFMD.^{10,11} The precise cause of the epidemic is still being investigated because there is a dearth of comprehensive scientific literature.^{12,13}

Aims & Objective:-

The aim of the study is to assess the knowledge and awareness regarding the safety issue, precaution needed to be taken to avoid tomato flu.

Methodology:-

The study was an observational prospective study. The research was carried out between August 20th and August 30th, 2022. A self-created questionnaire was created and distributed over social media. Our investigation was both cost economical and time efficient. The individuals were interested enough to complete our questionnaire. Participants in our study used smart phones or PCs with an internet connection. The research was carried out during a 10-day period. The questionnaire was created with the help of the

Union Ministry of Health and. The questions were on fundamental preventative strategies to test knowledge and raise awareness about tomato flu. The questions were written in a Google form and distributed over nine days. Using software such as Microsoft Excel, the answer was recorded and evaluated.

Result: -

Among 110 participants, Most of them were working professionals.

More than 60 % of our participants were following the safety measures and precautions suggested by CDC.

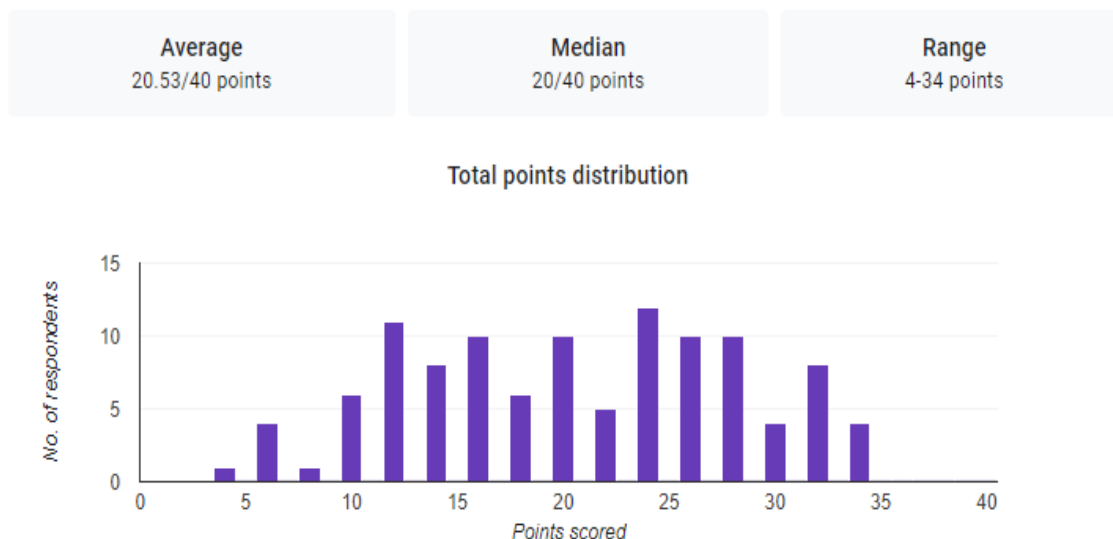


FIG 1: Total Points Distribution

TABLE No.1 Occupation

| Occupation | Number of Participants | Percentage |
|-----------------------------|------------------------|------------|
| Health care Professionals | 37 | 33.6% |
| Medical/Paramedical Student | 17 | 15.5% |
| Professor/Teacher | 10 | 9.1% |
| Other | 46 | 41.8% |

Occupation

0 / 110 correct responses

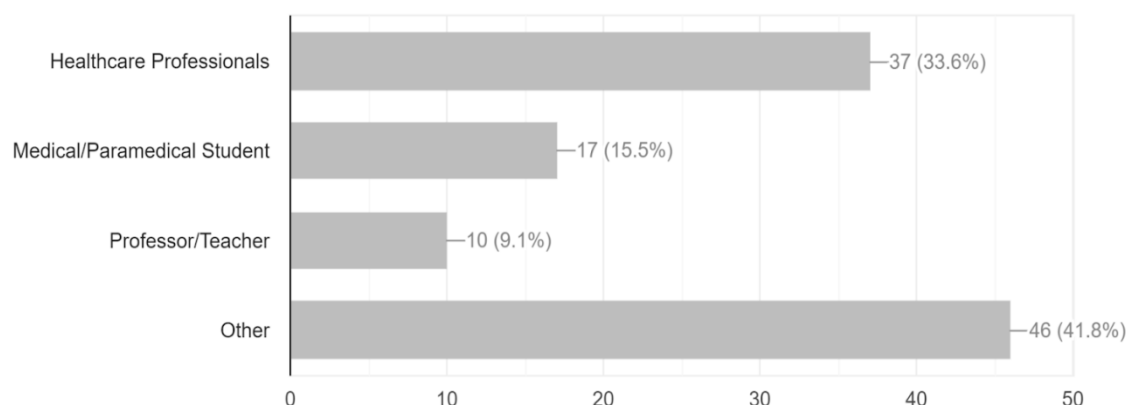


FIG 2 : Occupation distribution of participants

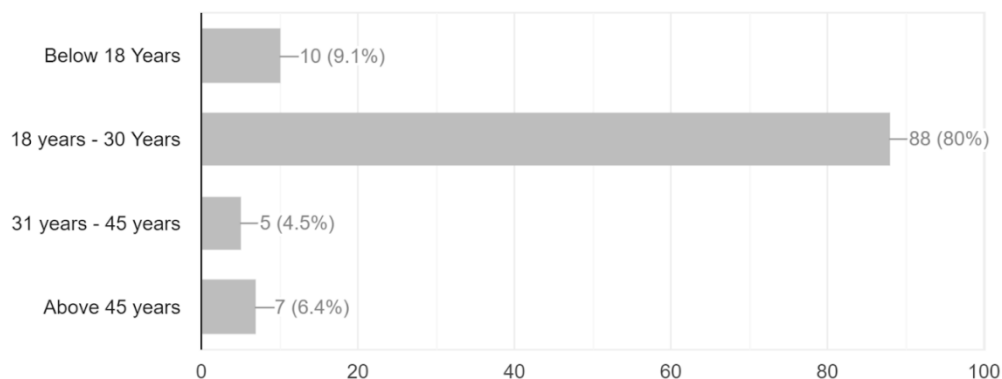
In our Prospective Study of 110 participants it has been found that 33.6% of our participants belong to healthcare related professions, 15.5% participants were Medical/Paramedical Student, 9.1% participants were Professor/Teacher and 41.8% participants were from other professional backgrounds.

Table 2: Age of participants

| Age of Participants | Number of Participants | Percentage % |
|---------------------|------------------------|--------------|
| <18 years | 10 | 9.1 |
| 18 years – 30 years | 88 | 80 |
| 31 years – 45 years | 5 | 4.5 |
| >45 years | 7 | 6.4 |

Age of Participants

0 / 110 correct responses

**FIG 3: Age Distribution of Participants**

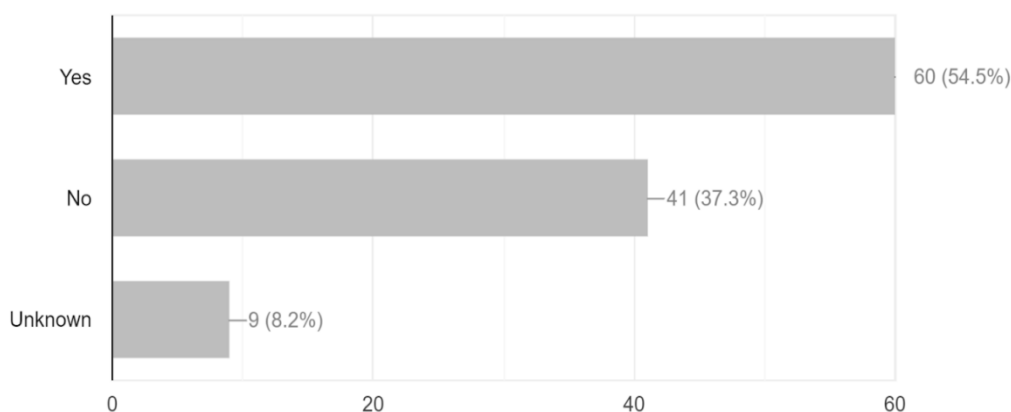
In addition we have got that 9.1% of our participants belong to age below 18 years, 80% of our participants belong to age group of 18-30 years, 4.5% of our participants belong to 31-45 years and 6.4% of our participants belong to age group of above 45 years.

Table 3: Mass Knowledge about Tomato Fever

| Options | Number of Participants | Percentage % |
|---------|------------------------|--------------|
| Yes | 60 | 54.5 |
| No | 41 | 37.3 |
| Unknown | 9 | 8.2 |

Do you know about the "Tomato Fever"?

0 / 110 correct responses

**FIG 4: Do you aware about the “Tomato Fever”?**

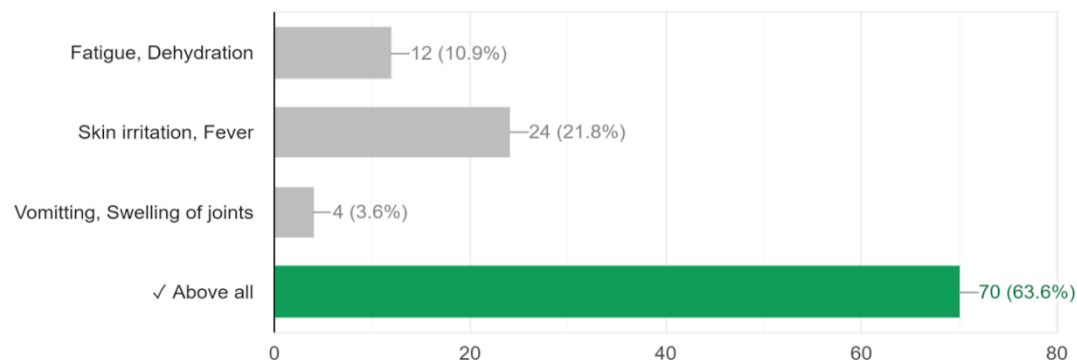
In our study, 54.5% of our participants have heard about Tomato fever, 37.3% of our participants have no idea about tomato fever, and 8.2% have no idea about tomato fever.

Table 4: Symptoms of Tomato Fever

| Symptoms | Number of Participants | Percentage % |
|------------------------------|------------------------|--------------|
| Fatigue, Dehydration | 12 | 10.9 |
| Skin Irritation, Fever | 24 | 21.8 |
| Vomiting, Swelling of joints | 4 | 3.6 |
| Above All | 70 | 63.6 |

What are the symptoms of tomato fever?

70 / 110 correct responses

**FIG 5: Symptoms awareness among Participants about “Tomato Fever”**

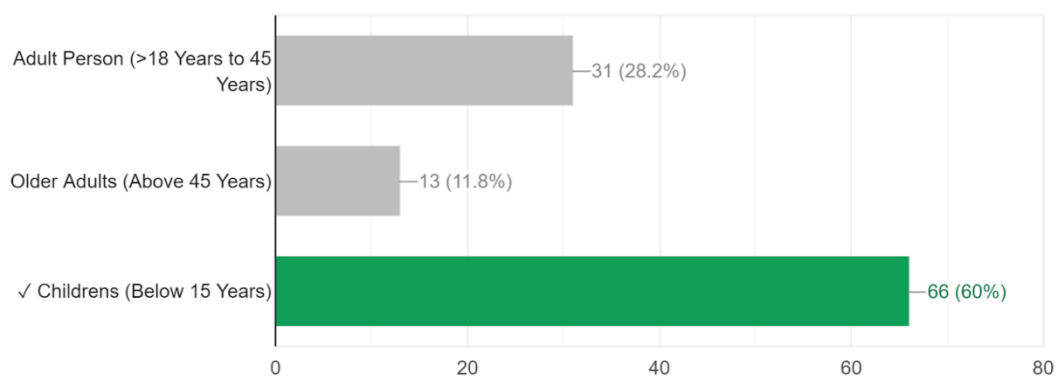
In this study we have found that symptoms of tomato fever were recognized as Fatigue and Dehydration by 10.9%, Skin irritation and Fever by 21.8%, Vomiting and Swelling of Joints by 3.6% and all the above symptoms by 63.6% of participants.

Table 5: Vulnerable group for this disease

| Options | Number of Participants | Percentage % |
|---------------------------------------|------------------------|--------------|
| Adult Person (>18 years to 45 years) | 31 | 28.2 |
| Older person (>45 years) | 13 | 11.8 |
| Children (<15 years) | 66 | 60 |

Who are more vulnerable to this disease?

66 / 110 correct responses

**FIG 6: Who are more vulnerable to “Tomato Fever?”**

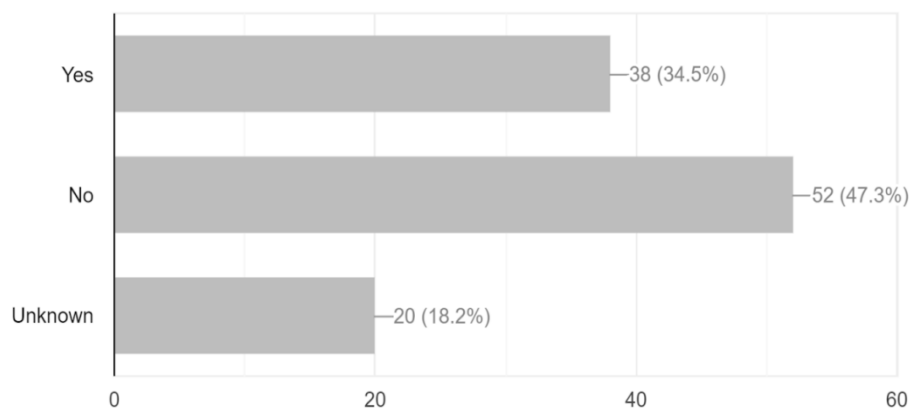
This study has shown 28.2% of our participants has selected adult person as vulnerable to this disease, 11.8% selected as older adults and 60% has selected as children below 15 years.

Table 6: Cause of Tomato Fever

| Options | Number of Participants | Percentage % |
|---------|------------------------|--------------|
| Yes | 38 | 34.5 |
| No | 52 | 47.3 |
| Unknown | 20 | 18.2 |

Do you know cause of this fever?

0 / 110 correct responses

**FIG 7: Awareness about the cause of “Tomato fever”**

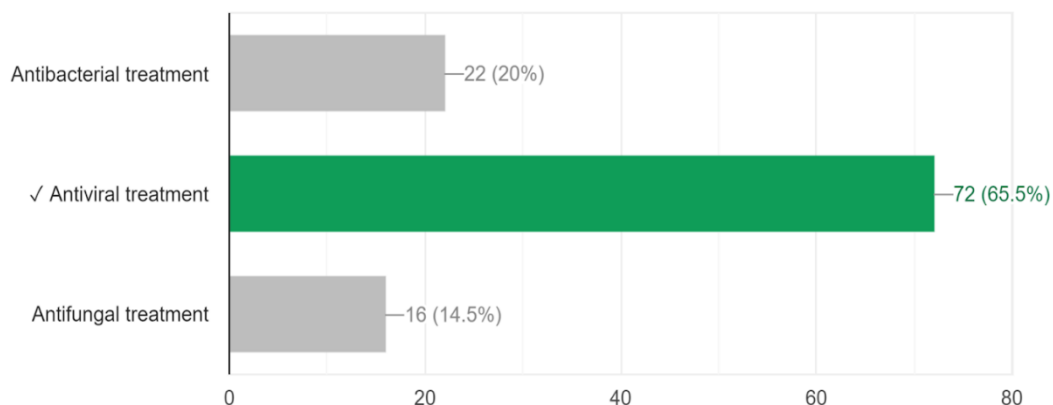
This study has shown that participants were not so aware of this fever as 34.5% of our participants says Yes, 47.3% has selected as option No and Unknown by 18.2%.

Table 7: Treatment available for this fever

| Options | Number of Participants | Percentage % |
|-------------------------|------------------------|--------------|
| Antibacterial Treatment | 22 | 20 |
| Antiviral Treatment | 72 | 65.5 |
| Antifungal Treatment | 16 | 14.5 |

What is the treatment available for this fever?

72 / 110 correct responses

**FIG 8: Treatment option available for “Tomato Fever”**

On asking about treatment for this fever, 20% of our participants has selected as antibacterial treatment, 65.6% has selected antiviral treatment and 14.5% has selected as antifungal treatment.

Table 8: Is hand hygiene essential for this fever ?

| Options | Number of Participants | Percentage % |
|---------|------------------------|--------------|
| Yes | 75 | 68.2 |
| No | 6 | 5.5 |
| Maybe | 29 | 26.4 |

Is hand hygiene essential for this fever?

75 / 110 correct responses

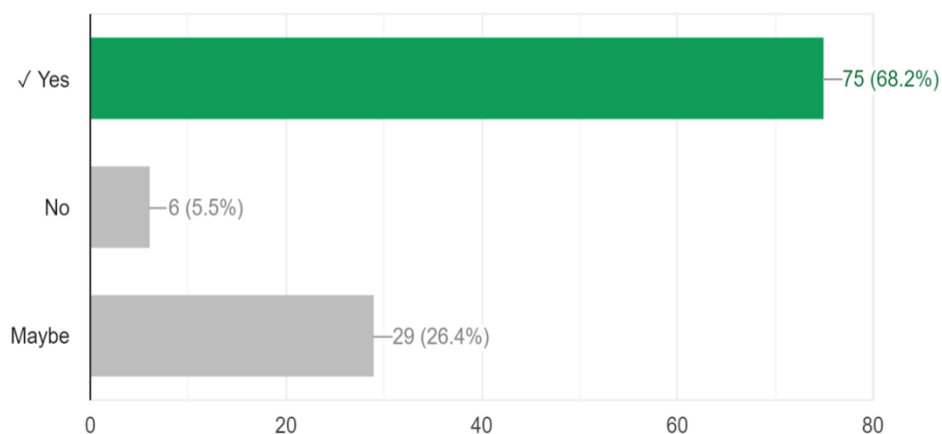


FIG 9: Is Hand Hygiene essential?

This following study has gathered information regarding hygiene for this fever where 68.2% of participants has selected Yes, 5.5% has selected No and Maybe by 26.4%.

Table 9: Is it has been detected in India ?

| Options | Number of Participants | Percentage % |
|---------|------------------------|--------------|
| Yes | 87 | 79.1 |
| No | 23 | 20.9 |

Is it has been detected in india?

87 / 110 correct responses

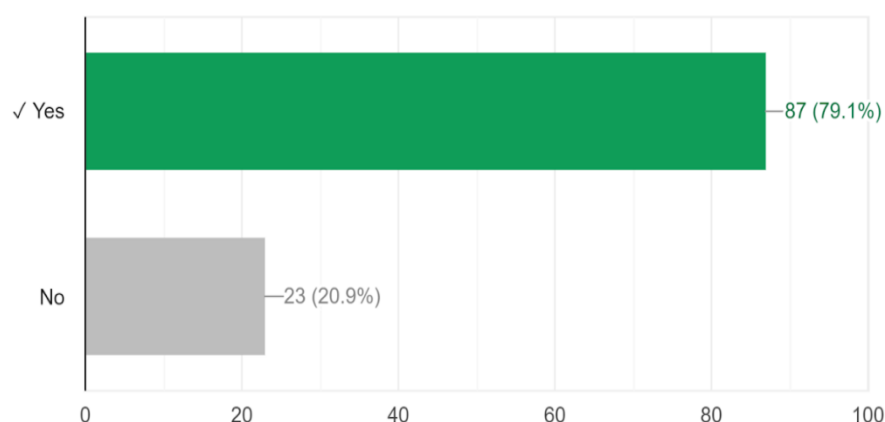


FIG 10: Is it has been detected in India?

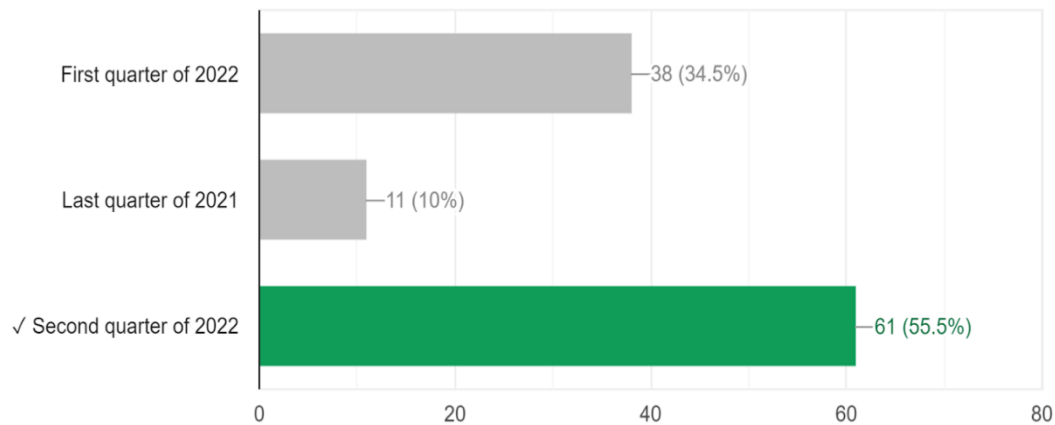
This survey has found that 79.1% of our participants knows that it has been detected in India and 20.9% of our participants were no aware of its detection in India.

Table 10: First case detected in India

| Options | Number of Participants | Percentage % |
|------------------------|------------------------|--------------|
| First quarter of 2022 | 38 | 34.5 |
| Last quarter of 2021 | 11 | 10 |
| Second quarter of 2022 | 61 | 55.5 |

when was the first case detected in India?

61 / 110 correct responses

**FIG 11: When was the first case detected in India?**

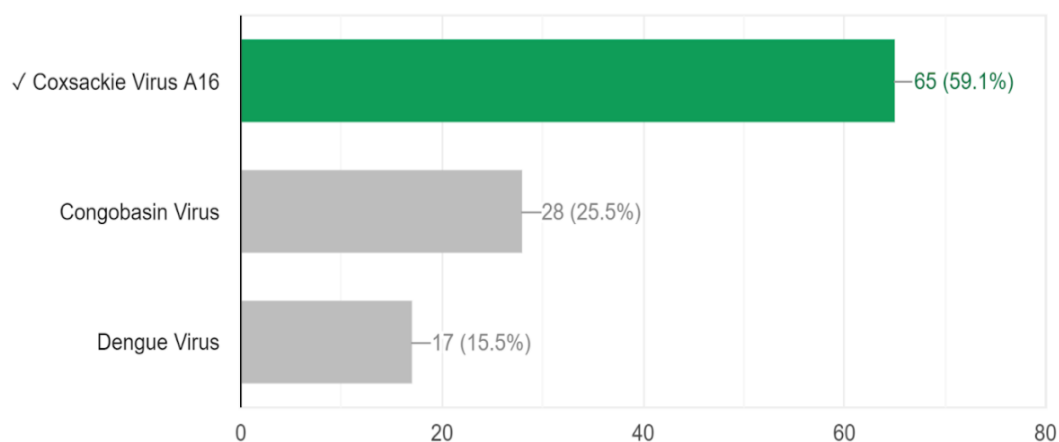
This survey question has first case detected in India has been known by 34.5% as first quarter of 2022, 10% as last quarter of 2021 and 55.5% as second quarter of 2022.

Table 11: Organism responsible for this fever

| Options | Number of Participants | Percentage % |
|---------------------|------------------------|--------------|
| Coxsackie Virus A16 | 65 | 59.1 |
| Congobasin Virus | 28 | 25.5 |
| Dengue Virus | 17 | 15.5 |

Which organism is responsible for this fever?

65 / 110 correct responses

**FIG 12: Which organism is responsible for this fever?**

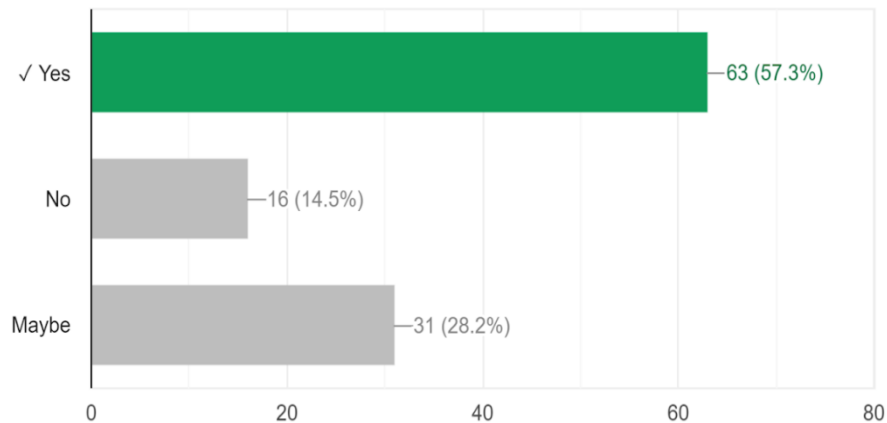
This prospective study has asked regarding organism responsible for this fever as participants has selected Coxsackie Virus A16 by 59.1%, 25.5% of congobasin Virus and Dengue Virus 15.5%.

Table 12 : Options and percentage of people knowing this is a contagious fever

| Options | Number of Participants | Percentage % |
|---------|------------------------|--------------|
| Yes | 63 | 57.3 |
| No | 16 | 14.5 |
| Maybe | 31 | 28.2 |

Is it contagious?

63 / 110 correct responses

**FIG 13: Is tomato fever contagious?**

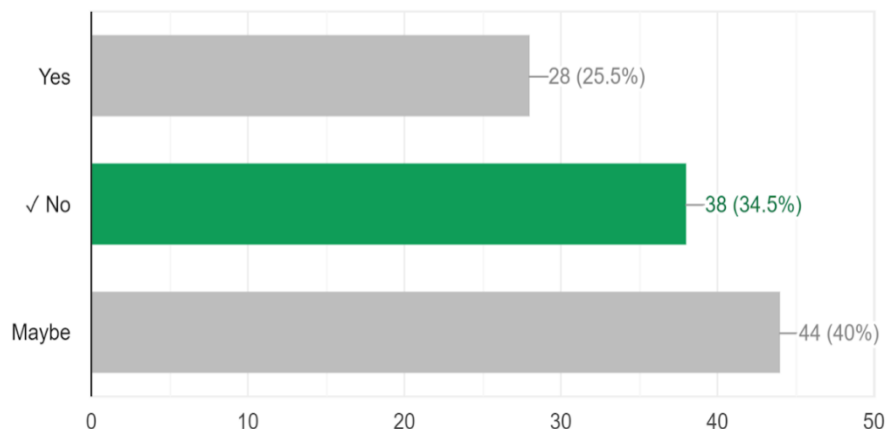
The contagious report has been found as 57.3% of participants have selected Yes, 14.5% has selected No and 28.2% has selected as Maybe.

Table 13: Is it capable of causing threat to someone's life

| Options | Number of Participants | Percentage % |
|---------|------------------------|--------------|
| Yes | 28 | 25.5 |
| No | 38 | 34.5 |
| Maybe | 44 | 40 |

Is it life threatening ?

38 / 110 correct responses

**FIG 14: Is “Tomato fever” life threatening?**

This study has found that life threatening has been found by 25.5% and 34.5% has not found them life threatening and 40% were not sure about this fever.

Table 14 : This table asks people should be concerned about this fever

| Options | Number of Participants | Percentage % |
|---------|------------------------|--------------|
| Yes | 68 | 61.8 |
| No | 22 | 20 |
| Maybe | 20 | 18.2 |

Should you be concerned about this fever ?

68 / 110 correct responses

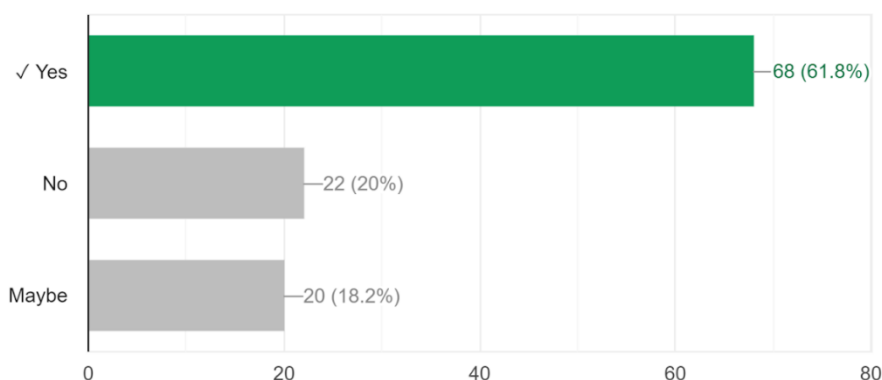


FIG 15: Should you be concerned about “Tomato Fever”

This study has asked people about concern regarding this fever and it has been found that 61.8% has concern, 20% has no concern and 18.2% were not so sure about this.

Table 15: Complications of this fever

| Options | Number of Participants | Percentage % |
|--------------------------|------------------------|--------------|
| Type 1 Diabetes Mellitus | 12 | 10.9 |
| Neuropathic Complication | 17 | 15.5 |
| Sore Formation | 23 | 20.9 |
| Skin Discoloration | 58 | 52.7 |

What are the complications ?

58 / 110 correct responses

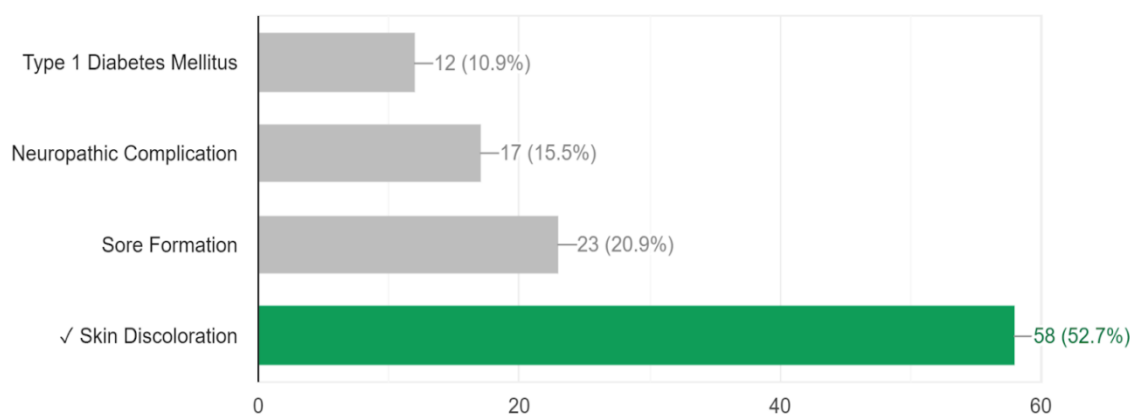


FIG 16: Complication of “Tomato Fever”?

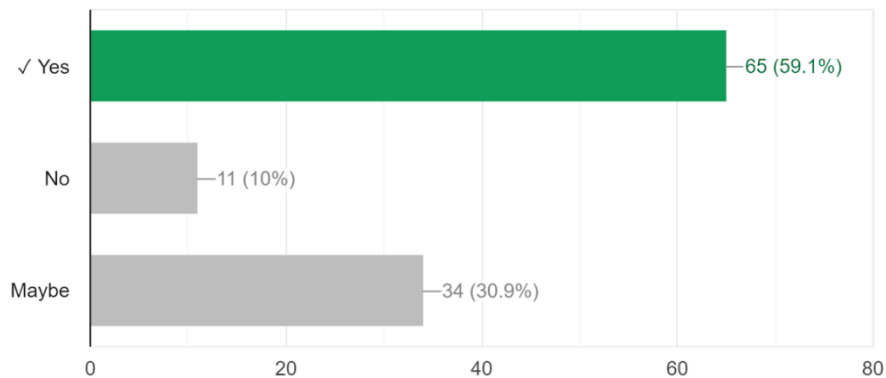
Regarding complications 10.9% has selected type 1 Diabetes Mellitus, 15.5% as Neuropathic Complication, 20.9% as sore formation and 52.7% as Skin Discoloration.

Table 16 :Is isolation a crucial factor in tomato fever

| Options | Number of Participants | Percentage % |
|---------|------------------------|--------------|
| Yes | 65 | 59.1 |
| No | 11 | 10 |
| Maybe | 34 | 30.9 |

Does patient need to be isolate ?

65 / 110 correct responses

**FIG 17: Does patient need to be isolate?**

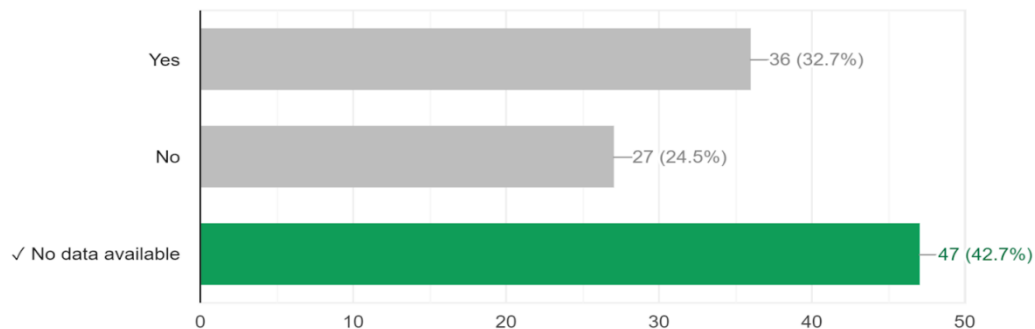
This study has found 59.1% of participants think that patient need to be isolated, 10% thinks no need of isolation and 30.9% has no idea.

Table 17 : Is it similar to dengue or Chikungunya

| Options | Number of Participants | Percentage % |
|-------------------|------------------------|--------------|
| Yes | 36 | 32.7 |
| No | 27 | 24.5 |
| No data available | 47 | 42.7 |

Is it similar to Dengue or Chikungunya ?

47 / 110 correct responses

**FIG 18: Is it similar to Dengue or Chikungunya?**

When asked regarding similarity to dengue or chikungunya participants has selected yes by 32.7%, No by 24.5% and 42.7% were not so sure as no data available.

Table 18: Fighting against the virus

| Options | Number of Participants | Percentage % |
|------------------------------------|------------------------|--------------|
| By isolating Yourself | 18 | 16.4 |
| By not sharing personal belongings | 20 | 18.2 |
| Above all | 72 | 65.5 |

How this fever can be fought ?

72 / 110 correct responses

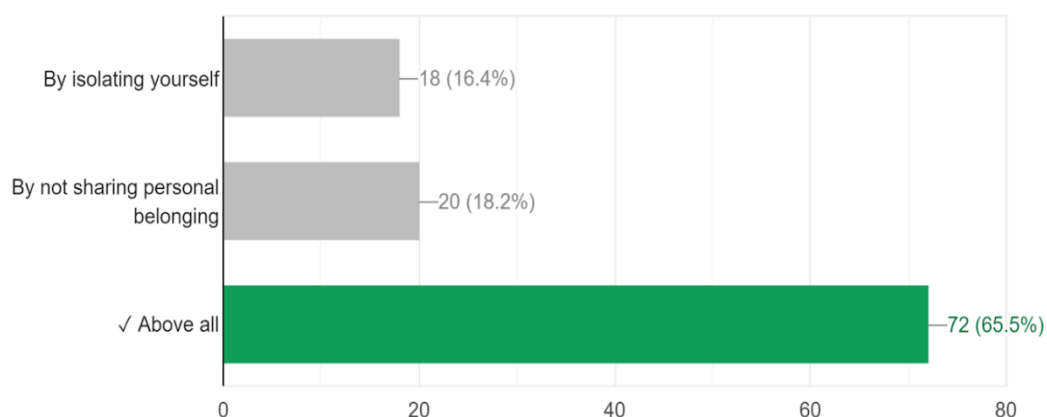


FIG 19: How to fight against “ Tomato Fever”

Study found that participants has selected isolation by 16.4%, by not sharing personal belonging by 18.2% and 65.6% has selected both the option.

Table 19: Any vaccine available for this disease

| Options | Number of Participants | Percentage % |
|---------|------------------------|--------------|
| Yes | 17 | 15.5 |
| No | 70 | 63.6 |
| Maybe | 23 | 20.9 |

Is there any vaccine available for this ?

70 / 110 correct responses

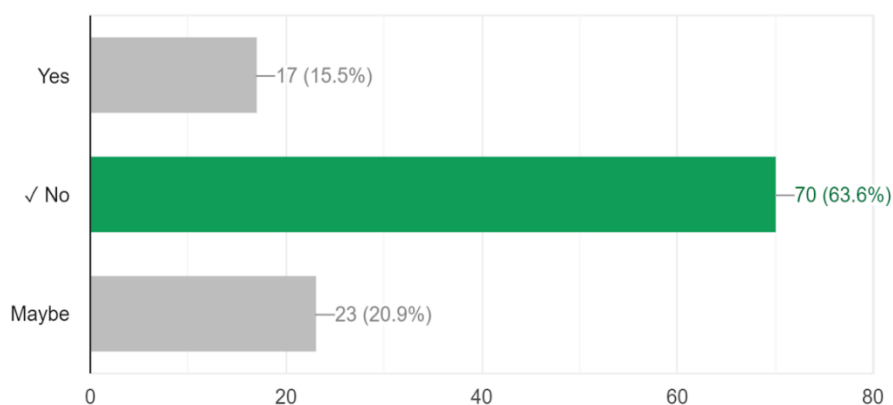


FIG 20 : Availability of vaccine for “ Tomato Fever”

When asked regarding any vaccine available for this fever, 15.5% has selected as Yes, 63.6% has selected no and 20.9% were not sure about its vaccine availability.

Table 20 : Available OTC medicine for tomato fever

| Options | Number of Participants | Percentage % |
|--------------|------------------------|--------------|
| Paracetamol | 70 | 63.6 |
| Doxycycline | 30 | 27.3 |
| Pantoprazole | 10 | 9.1 |

Available OTC medicine for tomato fever ?

70 / 110 correct responses

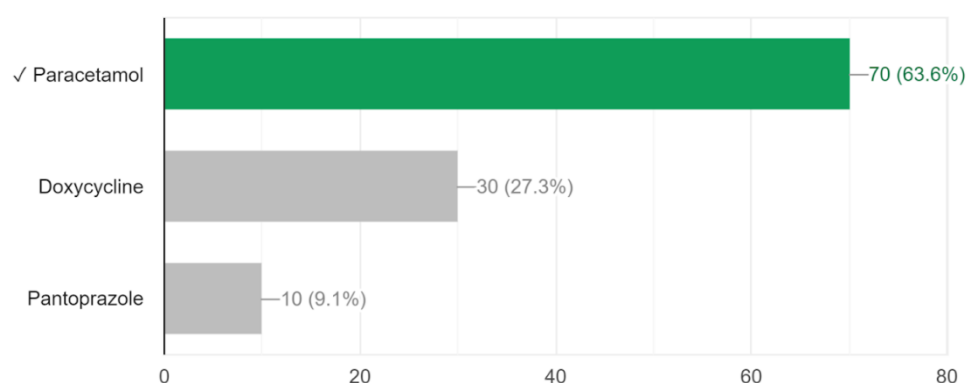


FIG 21 : OTC medication available for “Tomato Fever”

This study has question regarding available OTC medicine for Tomato fever which has been selected as Paracetamol by 63.6% of participants, Doxycycline by 27.3% of the participants and 9.1% selected as pantaprazole.

Table 21 : Advice from parents to their children

| Options | Number of Participants | Percentage % |
|---|------------------------|--------------|
| Maintain social distance & isolate yourself | 82 | 74.5 |
| Take protein rich diet | 21 | 19.1 |
| Regular exercise | 7 | 6.4 |

What advices to be given to children by their parents ?

82 / 110 correct responses

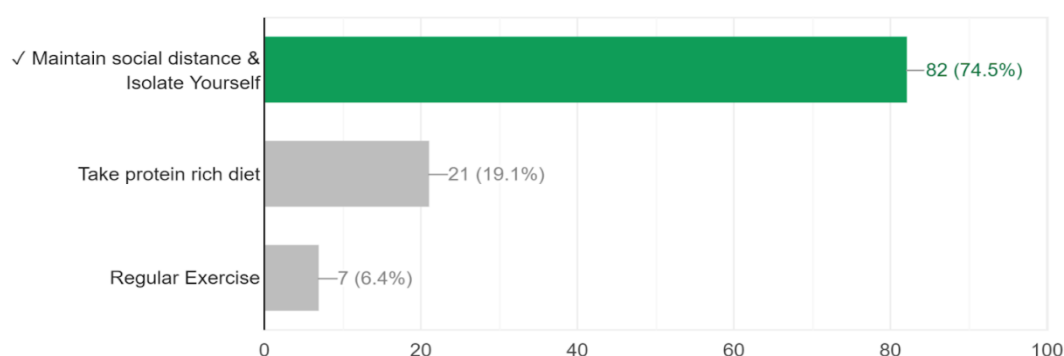


FIG 22: Advises to be given to children by parents for “Tomato Fever”

This study has asked participants regarding advice to children by their parents, where 74.5% has selected Maintain social distance and isolate you, 19.1% has selected to take protein rich diet and regular exercise by 6.4% of the participants.

Discussion:

This new illness has reached India while we wait for the coronavirus disease 2019 (COVID-19) epidemic to conclude. Named as tomato fever because of the painful blisters which is red in color and enlarge to size like tomato. It has been first identified in India in Kollam district of Kerala on May 6, 2022. More than 82 children were infected as reported by local government. Than this went to spread among Tamilnadu, Karnataka and few in odisha as per report by RMRC in bhubansewar. No other region have been effected.¹⁴

Primary symptoms are almost similar to chikungunya which includes rashes, intense joint pain with high fever. Some viral infections include nausea, vomiting, fatigue, diarrhea, dehydration, body aches and some influenza like symptoms of Dengue. Diagnosis of Tomato flu through serological and molecular tests of dengue, chikungunya, zika virus, varicella-zoster virus and herpes. When viral infection diagnosis is not observed, tomato flu virus contraction is taken into consideration. Since, it is similar to dengue and chikungunya treatment is similar. Isolation, rest, plenty of fluids and sponging with hot water is done to get relief from irritation and rashes.¹⁵ Paracetamol is given as supportive therapy. Take care of children is necessary because these age groups are vulnerable to such illness. As it is contagious touching of unclean surfaces, sucking unclean hands should be followed. Avoid Immediate contact with the infected person, Educate your child the signs and symptoms and its side effects, encourage the child to use handkerchief in case of running nose, try to keep hydrated, all utensils, clothes and other utilities items should be separated and sanitised regularly, get enough rest and sleep to promote healing.¹⁶

Conclusion:

As tomato fever is a new among all the types of flu, still its spread, cause, treatments are all similar to dengue and chikungunya. So, as this study concludes that most aren't aware of this fever, still they know that isolation is first step. As during recent pandemic everyone has learned about hygiene which is a crucial factor for this fever. Preventing infected child from sharing toys, clothes, food is one of the leading prevention. Drug repurposing is one of the most efficacious approach to ensure public safety. As no antiviral drugs or vaccine are available for prevention of tomato flu. Monitoring and follow up is needed for better understanding the potential treatment. Union home ministry and some state govt has already issued advisory regarding tomato fever.

Conflict of Interest: No

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