

Retrospective Cohort Studies on Dengue Fever in India

Harsha. Ravi. Gulabani

Student, SARASWATI INSTITUTE OF PHARMACEUTICAL SCIENCES
Corresponding Author: Dr. Madhuri.D. Pandole [drmadhuri2290@gmail.com]

Submitted: 01-03-2022

Accepted: 15-03-2022

ABSTRACT: This article is based on the current and ancient epidemic disease known as dengue fever which gets widely spread and has different serious conditions such as dengue shock syndrome or dengue hemorrhagic fever and has correlating and concurrent diseases such as malaria, chikungunya and COVID-19. Dengue is disease which is not easy to diagnose correctly as it has many common symptoms and it exhibits its exact symptoms later in time. There are 4 different types of viruses causing dengue DENV1, DENV2, DENV3 and DENV4. According to physicians there is no treatment of dengue it can only be managed according to symptoms and severity of its case.

KEYWORDS: Dengue Fever, Epidemiological Data, Virus, COVID-19

I. INTRODUCTION

Dengue is a bone breaking fever resulting from viruses DENV 1, DENV2, DENV3 and DENV4 that is transmitted to people with the aid of using vectors that allows in spreading worldwide. Dengue virus turned into first reported in Japan in 1943 and at Calcutta (now Kolkata) in 1944. First epidemic of dengue-like contamination turned into visible in Madras (Chennai) in 1780, tested virological epidemic turned into in 1963-1964 in Calcutta and Japanese fever of India. Transmission of dengue takes place through a precept vector Aedes mosquitoes, its gnat mosquito gnat shape of transmission or mosquito gnat mosquito form of transmission with an incubation duration of 3 to 14 days that could typically vary as much as 4 to seven days. Symptoms of dengue encompass slight signs along with fever, arthralgia, myalgia, or perhaps a rash following the fever the relaxation of the gastrointestinal signs along with nausea, vomiting etc. might arise and those signs usually last as long as to seven days. In excessive instances whilst the fever does not now no longer subside for nearly days or 24-48 hours those signs along with stomach pain/tenderness, vomiting for 3 instances an afternoon or maybe more, bleeding

from nostril or gums, blood in stool or for the duration of vomiting are one the severe for a glance out, fatigue or irritability.^(1,2,3)

❖ Pathogenesis Of Dengue Fever

The reaction of the frame in the direction of dengue virus is assessed into those 3 categories

1. Antibody responses,
2. Cytokine responses, and
3. Cellular reaction
 - DENV Tropism
 - Cells of the immune system
 - Organ pathology
 - Transient Autoimmunity Antibodies
 - Antibody-Dependent Enhancement
 - Cross-Reactive T-Cell Response
 - Soluble Factors

The pathophysiology of dengue is basically primarily based totally at the secondary-contamination or immune enhancement speculation. So consistent with the modern-day speculation DENV tropism in human frame takes place whilst a mosquito bites and the virus enters the frame and begins off evolved to contaminate the cells due to the fact the virus is circulating thru the bloodstream it additionally enters the lymph nodes, later it begins off evolved infecting the organs. Its presence has been showed in numerous organs of a human frame along with liver, spleen, lung, mind and plenty of more.

The subsequent speculation is virus virulence that is primarily based totally on severity of the virus that enters the frame because the DENV virus is of four sorts and additionally this speculation helps the impact of temporary immunity or the immunity received submit contamination of someone DENV virus this is additionally called secondary- contamination. The severity of the ailment may also rely on the host genetic elements in addition to the innate immunity of the affected person.⁽⁴⁾

II. PATHOLOGY

Febrile Phase

- Fever usually lasts 2–7 days and may be biphasic.
- Other symptoms and signs might also additionally encompass excessive headache; retro-orbital eye pain; muscle, joint, and bone pain; macular or maculopapular rash; and minor haemorrhagic manifestations along with petechiae, ecchymosis, purpura, epistaxis, bleeding gums, haematuria, or a wonderful tourniquet check result.
- Some sufferers have injected oropharynx and facial erythema with inside the first 24–forty eight hours after onset.

Critical Phase

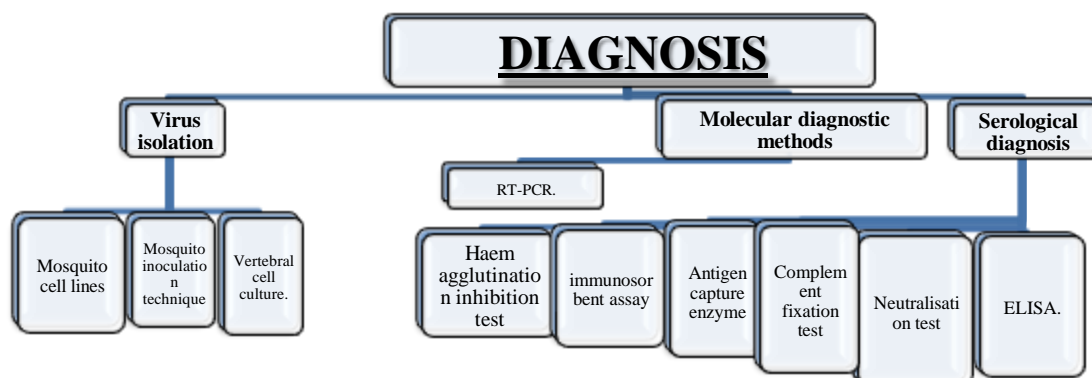
- The important section of dengue starts off evolved at defervescence and usually lasts 24–forty eight hours.
- Most sufferers clinically enhance for the duration of this section, however people with massive plasma leakage can, inside some hours, expand excessive dengue because of a marked growth in vascular permeability.
- Initially, physiologic compensatory mechanisms hold good enough circulation, which narrows pulse strain as diastolic blood strain increases.
- Patients with excessive plasma leakage might also additionally have pleural effusions, ascites, hypoproteinemia, or hemoconcentration.
- Patients might also additionally seem like properly in spite of early symptoms and symptoms of surprise. However, as soon as

hypotension develops, systolic blood strain unexpectedly declines, and irreversible surprise and demise might also additionally happen in spite of resuscitation.

- Patients also can expand excessive haemorrhagic manifestations, along with hematemesis, bloody stool, or menorrhagia, in particular in the event that they were in extended surprise. Uncommon manifestations encompass hepatitis, myocarditis, pancreatitis, and encephalitis.

Convalescent Phase

- As plasma leakage subsides, the affected person enters the convalescent section and starts off evolved to reabsorb extravagated intravenous fluids and pleural and belly effusions.
- As an affected person’s properly-being improves, hemodynamic reputation stabilizes (even though she or he might also additionally occur bradycardia), and diuresis ensues. The affected person’s haematocrit stabilizes or might also additionally fall due to the dilutional impact of the reabsorbed fluid, and the white molecular matter commonly begins off evolved to rise, observed with the aid of using a recuperation of platelet matter.
- The convalescent-section rash might also additionally desquamate and be pruritic.
- Laboratory findings typically encompass leukopenia, thrombocytopenia, hyponatremia, accelerated aspartate aminotransferase and alanine aminotransferase, and a regular erythrocyte sedimentation rate.⁽⁵⁾



III. MANAGEMENT

Bed rest is advised during start phase. Use of water sponging to lower the temperature, use of antipyretic's such as acetaminophen are suggested to lower the body temperature, avoid use of aspirin or non-steroidal anti-inflammatory drugs like Ibuprofen, etc. as it may cause gastritis, vomiting, acidosis, platelet dysfunction and severe bleeding. Acetaminophens preferable in the doses given below { 1-2 years: 60 -120 mg/dose • 3-6 years: 120 mg/dose • 7-12 years: 240 mg/dose • Adult: 500 mg/dose.} oral rehydration therapy is recommended for patients with fluid loss through excessive perspiration and/or vomiting. Patients are to be continuously monitored for complication 24-48 hours post diagnosis of dengue fever genetic factors as well as the innate immunity of the patient. ⁽⁷⁾

PREVENTION

Prevention of dengue is possible by just avoiding bite of mosquitos during the illness or as such also. To do so mosquito breeding should be prevented by removing stagnant water or changing water frequently, disposal of solid waste and using proper insecticides. Protection from mosquito bites can also be done by applying mosquito repellents or using coils, wearing appropriate length of clothes to decrease the exposure from mosquitoes, sleeping in

mosquito nets at night and educating the communi9ty about the disease ⁽⁸⁾

Vaccination for dengue fever is also a good way to be prevented from dengue. The dengvaxia or CYD-TDV is the first dengue vaccine to be licensed in 20 countries till now and is available for 9-45 years of age living in epidemic areas. CYD-TDV is a live recombinant tetravalent dengue vaccine developed by Sanofi Pasteur (CYD-TDV), given as a 3-dose series on a 0/6/12 month schedule.

❖ Coinfection Of Dengue

Coinfection of dengue are malaria and chikungunya as these diseases have same vector that are mosquitoes and also are arthropod borne diseases. Chances of malaria as a coinfection are more prevalent that chikungunya. Other than these two disease dengue can also infect a patient also suffering with SARS-COV-2 or also known as covid-19, Various common mechanisms can explain the signs and symptoms observed in co-infected patients but most will have, that are Antibody-dependent enhancement (ADE), Cytokine Storm, Vasculopathy and Coagulopathy.^(11,12)

❖ Epidemiological Data On Dengue Fever

This data includes the number of cases registered and number of deaths registered in India from 2015 to 2021 (till October)^(9,10)

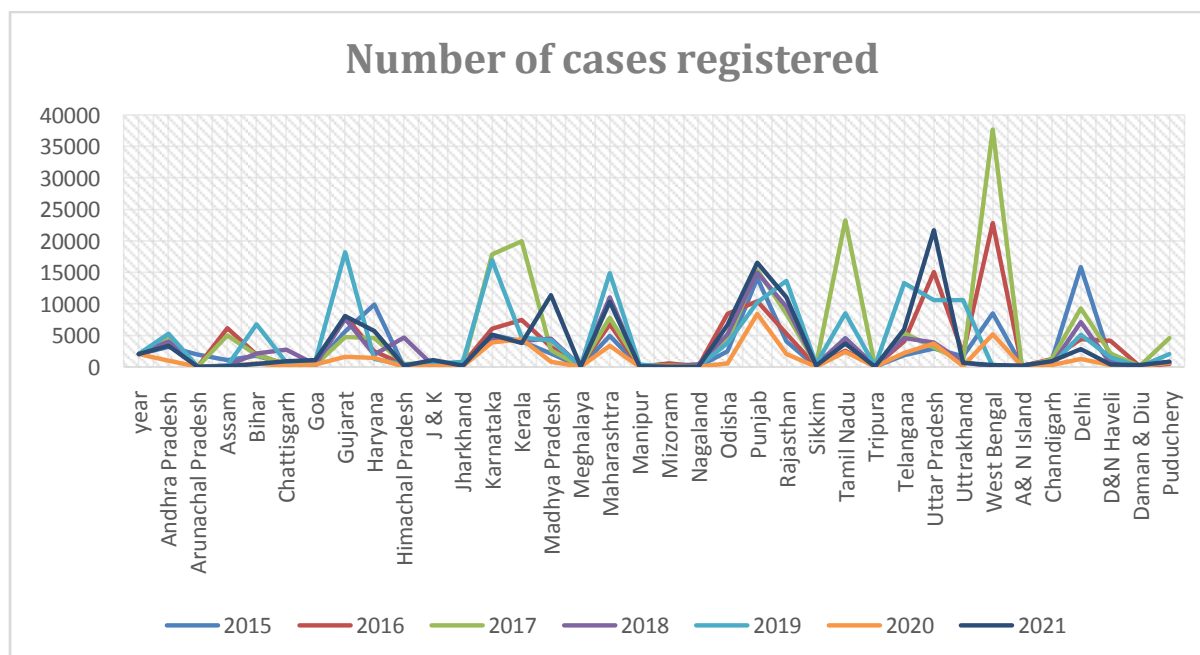


Fig.1 Number of cases registered from 2015 to 2021, state wise data

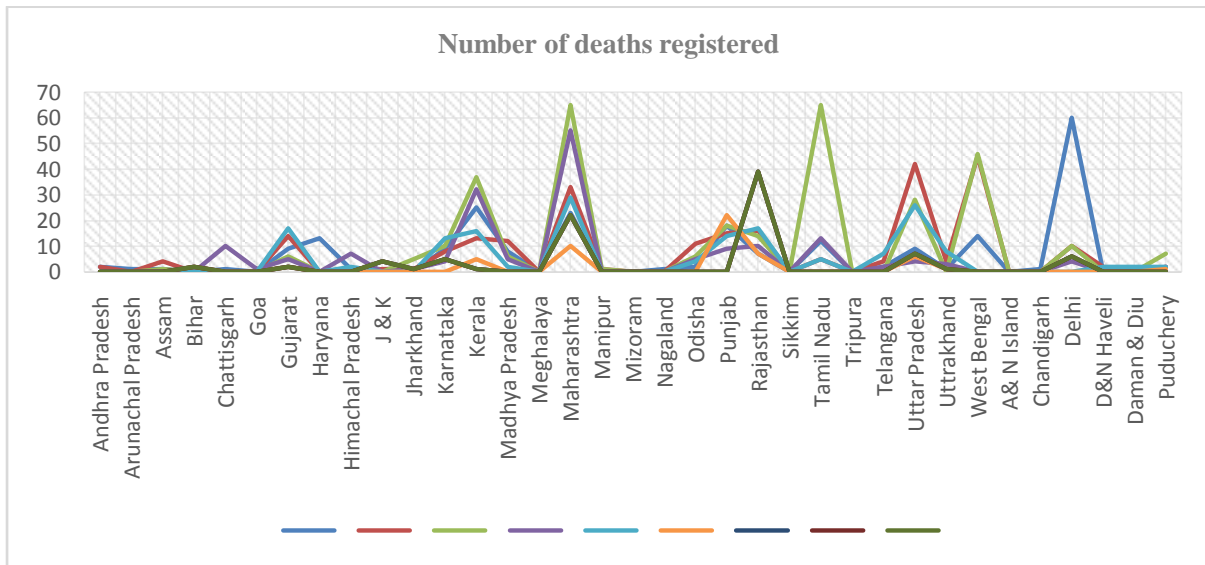


Fig.2 Number of deaths registered from 2015 to 2021, state wise bifurcated data

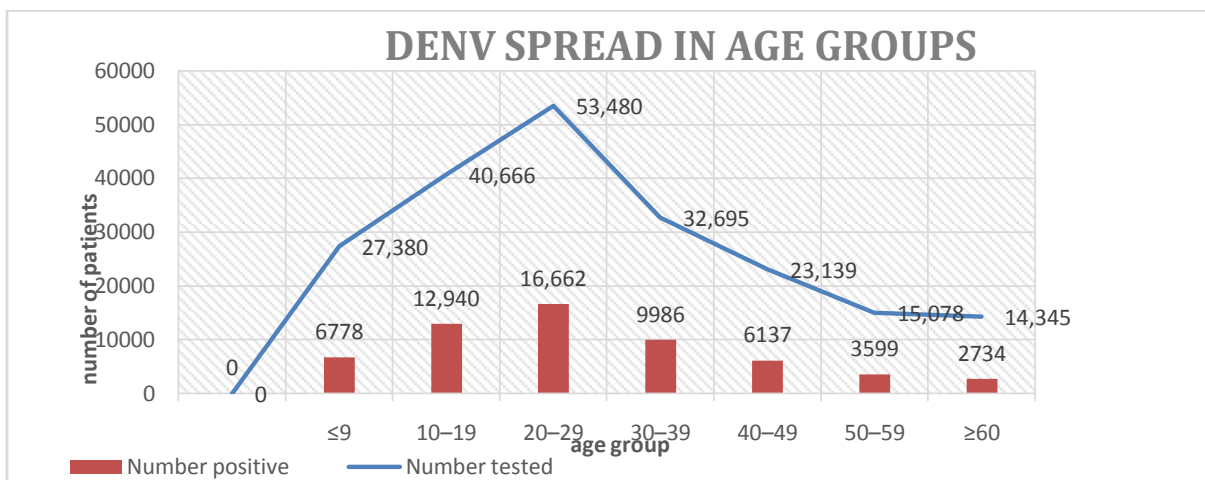


Fig.3 Number of patients tested and positive in different age groups

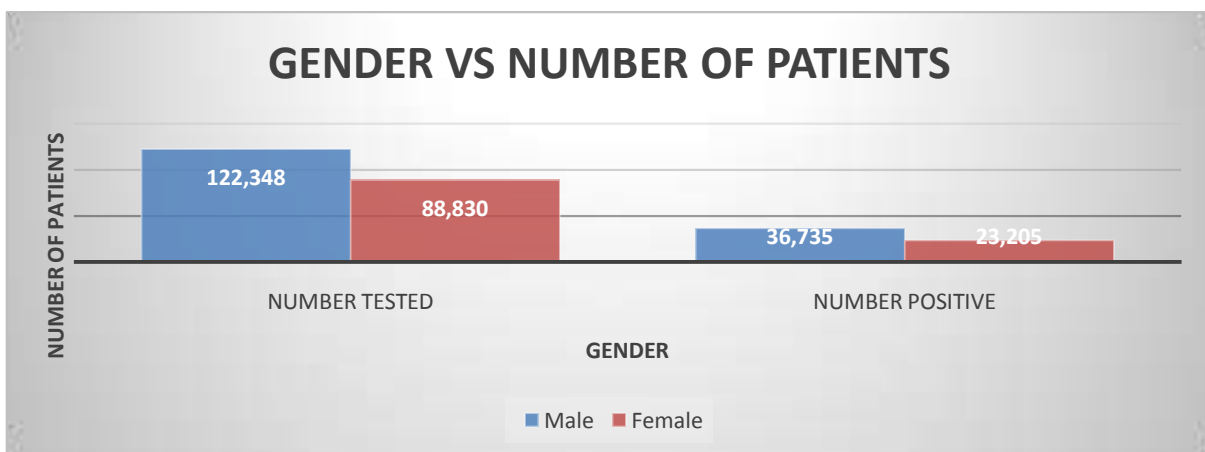


Fig.4 Number of patients tested and positive in males and females

IV. CONCLUSION

Looking back on this project, the overall outcome of results to be observed is that dengue fever is still prevalent in all the states of India despite of all the preventions taken. Dengue virus is not so dangerous if caught early if not can cause different severe complications. It cannot be treated, just managed by managing the aggravating symptoms such as the high fever, vomiting, aches etc. adding to that it can be mistaken to many of its coinfection like malaria chikungunya or even covid-19, so proper diagnosis is done by distinguishing the results closely and performing all the tests to rule out other coinfections. Dengue fever can occur due four types of viruses which is the reason there is WHO approved vaccine known as CYD-TDV or dengvaxia, other than that there simple household preventative measures such as , to avoid stagnating water, or usage of mosquito net while sleeping. The prevalence of dengue has decreased in many states of India due the knowledge spread by the government on the preventative measures of dengue but on the contrary there has been increase in cases as well in few states such as there was a sudden spike of case in Punjab in 2018 going to 14980 and also in 2020 going to 8435.

REFERENCES

- [1]. <https://www.chp.gov.hk/en/healthtopics/content/24/19.html>
- [2]. <https://nvbdcp.gov.in/WriteReadData/1892s/Clinical%20Guidelines.pdf>
- [3]. <https://www.cdc.gov/dengue/symptoms/index.html>
- [4]. Malavige GN, Fernando S, Fernando DJ, et al. Dengue viral infections. Postgraduate Medical Journal 2004; **80**:588-601.
- [5]. Martina, Byron E E et al. "Dengue virus pathogenesis: an integrated view." Clinical microbiology reviews vol. 22, 4 (2009): 564-81. doi:10.1128/CMR.00035-09
- [6]. Dengue. Guidelines for diagnosis, treatment prevention and control, Geneva, World Health Organization, 2009, WHO/HTM/NTD/DEN/2009.
- [7]. Handbook for Clinical Management of Dengue. Geneva: World Health Organization; 2012.
- [8]. <https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue>
- [9]. <https://nvbdcp.gov.in/index4.php?lang=1&level=0&linkid=431&lid=3715>
- [10]. <https://www.sciencedirect.com/science/article/pii/S1201971219300153#:~:text=The%20proportion%20of%20laboratory%20confirmed,aged%20%20years%20or%20more.>
- [11]. <https://www.mohfw.gov.in/pdf/GuidelinesformanagementofcoinfectionofCOVID19withotherseasonalepidemicpronediseases.pdf>
- [12]. [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6210850/#:~:text=Dengue%20and%20chikungunya%20\(CHIK\)%20infections,they%20can%20be%20transmitted%20together.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6210850/#:~:text=Dengue%20and%20chikungunya%20(CHIK)%20infections,they%20can%20be%20transmitted%20together.)