TO STUDY THE CLINICAL PROFILE OF PATIENTS INFECTED WITH DENGUE IN A TERTIARY CARE CENTER INCOVID PANDEMIC ERA.

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ABSTRACT- Dengue infection has always been a major challenge to thepublic health and in the absence of specific treatment and availability of effective vaccine, this infection has been able to cause repeated outbreaks in different parts of the world for the past many years. This study was planned to analyse the symptoms and complications of dengue positive patients in the backdrop of Covid -19 pandemic.METHODS- A retrospective observational analysis was done on 87 patients presenting to a tertiary care center in northern India by taking into account of their presenting symptoms, haematological parameters and complications. RESULTS- Out of 87 patients 59 (67%) were males and 28 (32%) were females with maximum (36%) belonging to the age group of 18-30 years. 69% patients were from village areas. Fever, headache were the most common symptoms and thrombocytopenia (99%) was the most common haematological complication followed by liver dysfunction (88%). Respiratory symptoms were seen in 18% and skin manifestations were seen in 12% patients. CONCLUSION-Dengue infection continues to be a major cause of morbidity and mortality in many parts of the world. The early recognition of symptoms and signs is imperative to the successful management of disease. With the existence of Covid 19 infection it becomes more important to carefully observe and differentiate between the two viral illnesses as both can have overlapping symptoms.

KEYWORDS- dengue fever, Covid 19 pandemic, rural, thrombocytopenia, rash.

INTRODUCTION

The dengue infection over the past few years has seen a constant upsurge in its incidence across the globe which has made it earn a place among the top ten global health threats in the list released by World Health Organization (WHO). [1]. Dengue virus is a flavivirus transmitted by mosquito vectors, such as *Aedes aegypti* and *Aedes albopictus*. According to the WHO, dengue is one of the mosquito-borne viral diseases that produces a high medical burden in many regions worldwide. Around 5 decades ago, only limited number of countries reported dengue epidemics. However, the disease is now endemic in many countries in the regions of Asia, America and Africa. New outbreaks have been reported from some parts of Europe also. [2, 3] In our country the incidence has increased in the past decades due to the rapid urbanisation as a result of unchecked migration in the urban regions, inadequate water and waste management systems giving rise to poor living conditions. The disease had initially been dominant in urban areas, but now it is being reported from the rural areas as well. [4] The clinical and laboratory profile is important for diagnosis and successful management of the disease, hence this study was done to analyse varied clinical and laboratory profiles of serologically confirmed patients of dengue typically in the background of Covid- 19 pandemic which can have overlapping features with dengue.

AIM

This study aimed at detailing the clinical profile including lab parameters, symptoms, complications and effect of comorbidities in patients suffering from dengue and to find out occurrence of any atypical manifestations of the disease especially in the Covid-19 pandemic era.

MATERIAL AND METHODS

The study was conducted as a retrospective observational analysis with review of records of admitted patients of Dengue in the Dept. of Medicine from September to December 2021 at Gian Sagar Medical College and Hospital Rajpura.

INCLUSION CRITERIA

1. Patients of age18 years and above.
2. Patients diagnosed with dengue with positive NS1 antigen and/or IgM antibody positive on serology.

EXCLUSION CRITERIA

1. Patients below the age of 18 years

2. Patients having co infections like malaria, typhoid, Covid 19 etc.
3. Patients presenting with acute febrile illness and negative Dengue serology.

RESULTS

A total of 87 patients were included in this study. Age range was from 18 years to 85 years. Among them 59 (67%) were males and 28 (32%) were females. 69 (79%) patients belonged to rural area and 18 (20%) patients belonged to urban area. Maximum patients belonged to age group of 18-30 years (36%) followed by the age group of 31-50 years (33%). Fever, pain abdomen, vomiting, body aches, myalgias, arthralgias, headache, retro orbital pain and diarrhea were commonly observed among the patients.

Table 1 – Distribution Of Age Among The Dengue Patients.

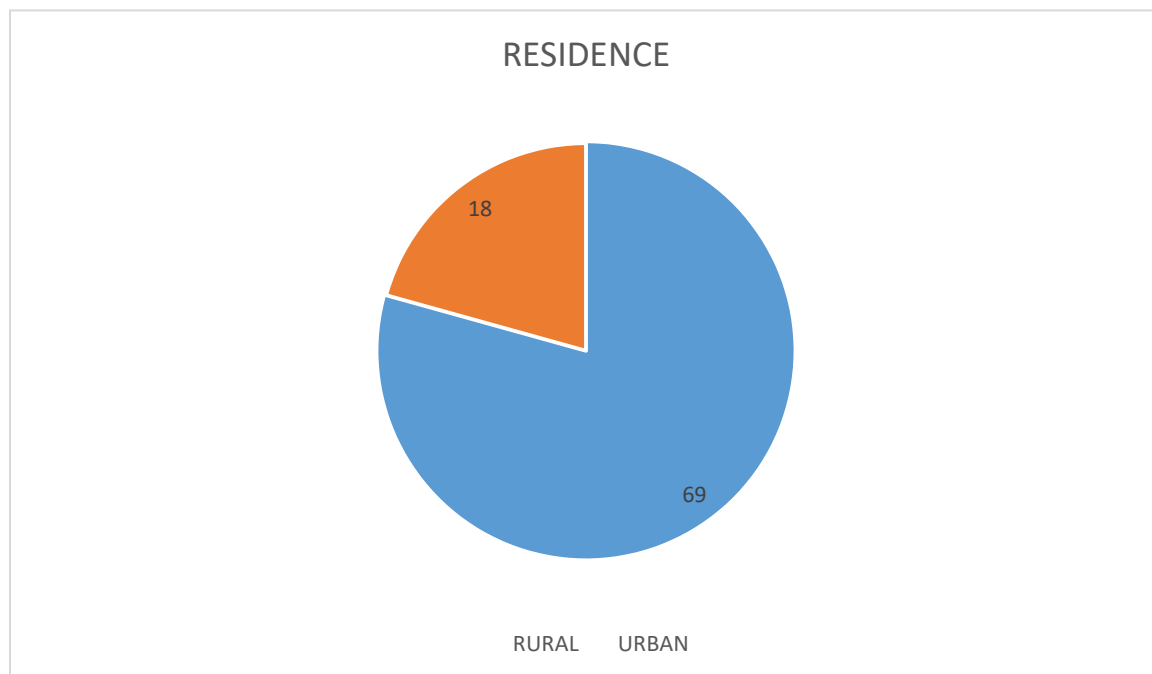| AGE GROUPS (in years)	NO. OF PATIENTS (n=87)
18-30	32 (36%)
31-50	29 (33%)
51-70	17 (19%)
71-90	9 (10%)

FIGURE 1- RESIDENTIAL (RURAL/URBAN) DISTRIBUTION OF THE DENGUE PATIENTS IN THE STUDY.

Out of 87 patients, 78 (89%) were NS1 antigen positive, 5 (6%) patients were IgM positive, 2 (2%) were NS1 and IgM positive, 1 (1%) had NS1 and IgG positive and 1 (1%) had NS1, IgM and IgG positive.
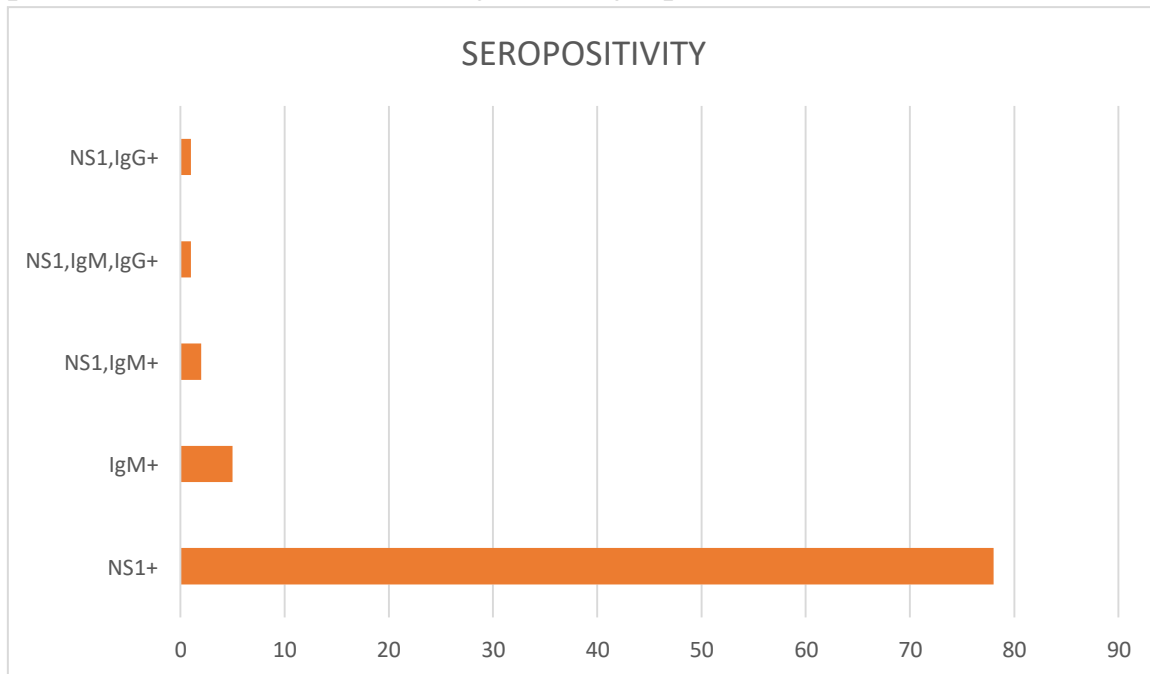

FIGURE 2- DIFFERENT PATTERNS OF DENGUE SEROPOSITIVITY.

Symptoms among the patients

Fever was the common presenting symptom observed in all patients (100%) followed by headache 58%, arthralgia in 57% patients and retro orbital pain in 56% patients. Vomiting was seen in 26% patients and diarrhea was noted in 11% patients. Pain abdomen was seen in 29% patients Among bleeding manifestations hematemesis, gum bleeding, hematuria, malena and epistaxis were seen. Dermatological manifestation in the form of rashes was seen in 12% of patients. Itching was seen among 31% patients. Respiratory symptoms were observed in 18% patients.

TABLE 2 – DIFFERENT SYMPTOMS AMONG THE PATIENTS OF DENGUE.

SYMPTOMS	NO. OF PATIENTS (%) (n=87)
FEVER	87 (100%)
HEADACHE	51 (58%)
RETRO ORBITAL PAIN	49 (56%)
MYALGIAS	32(36%)
ARTHRALGIAS	50 (57%)

VOMITING	23 (26%)
DIARRHEA	10 (11%)
RASHES	11 (12%)
HEMETEMESIS	01 (1%)
HEMATURIA	01 (1%)
PAIN ABDOMEN	26(29%)
EPISTAXIS	01 (1%)
GUM BLEEDING	01 (1%)
MALENA	2(2%)
ITCHING	27 (31%)
COUGH WITH RHINITIS SORE THROAT	16(18%)

TABLE 3– COMPLICATIONS SEEN AMONG THE PATIENTS OF DENGUE.

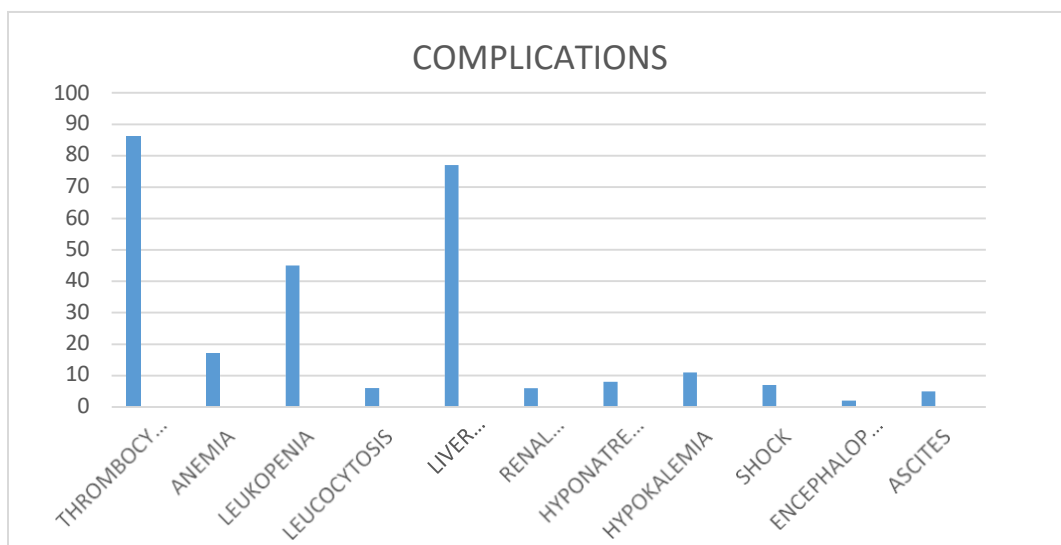| COMPLICATIONS	NO. OF PATIENTS (%) (n=87)
THROMBOCYTOPENIA	86 (99%)
ANEMIA	17 (19%)
LEUKOPENIA	45 (51%)
LEUCOCYTOSIS	6 (7%)
LIVER DYSFUNCTION	77 (88%)
RENAL FAILURE	6 (7%)
HYPONATREMIA	8 (9%)
HYPOKALEMIA	11 (12%)
SHOCK	7 (8%)
ENCEPHALOPATHY	2 (2%)
ASCITES	5 (6%)

FIGURE 3 – COMPLICATIONS AMONG THE DENGUE PATIENTS.

Thrombocytopenia was observed in 99% patients with 85% patients having platelets less than 50000/cumm.

TABLE 4 – DISTRIBUTION OF THROMBOCYTOPENIA

PLATELET COUNT (l/cumm)	NO. OF PATIENTS (n=87)
>150000	1 (1%)
100000-150000	4 (4.5%)
50000-100000	8 (9%)
<50000	74 (85%)

Co morbid conditions like Diabetes mellitus, hypertension, hypothyroidism, CAD, COPD, Epilepsy, and Hepatitis C were observed in this study and both diabetes and hypertension combined were seen in 11% patients while 3% were only diabetic and 4% were only hypertensive.

TABLE 5- COMORBIDITIES SEEN AMONG THE PATIENTS

COMORBIDITIES	NO. OF PATIENTS
DIABETES MELLITUS	3
HYPERTENSION	4
DIABETES MELLITUS & HYPERTENSION	10
HYPOTHYROIDISM	1
CORONARY ARTERY DISEASE	1
STROKE	1
EPILEPSY	1
HEPATITIS C	1
COPD	1

DISCUSSION

In our study, maximum patients (36%) belonged to the age group of 18-30 years followed by the age group of 31-50 years (33%). This trend was consistent with various other studies. Dinkar et al reported 176 out of 461 (38%) patients belonging to age group between 20-30 years in their study. Similarly Singh et al reported 48.6% patients from the age group of 18-35 years. [5, 11]

In this study gender distribution showed a male preponderance with 59 (67%) males suffering from dengue as compared to 28 (32%) females. The pattern of male predominance has also been reported in several other countries and reason could be the greater vulnerability of the exposure to the dengue vectors due to increased outdoor activities. In addition there are also differences in the healthcare-seeking behaviour among the females and males. [6, 7]

Dengue fever had been reported to exist as an urban disease as multiple outbreaks were reported from large metropolitan cities of India. Major

outbreaks of epidemic proportion have been reported from densely populated and urbanised cities of India like Delhi, Chandigarh, Bengaluru, Gwalior, Ludhiana, Chennai, Lucknow and Kolkata. The mosquitoes get a favourable breeding environment in densely populated urban areas especially during rainy season. [8] The rapid growth of infrastructure accompanied by poor water supply, inadequate water drainage systems and inadequate waste management systems lead to water logging and provide an ideal condition for the proliferation of vector in the city areas. [5]

However the disease, which typically had an urban distribution a few decades earlier, is now reported from the rural areas as well. [9, 10] Dengue outbreaks are now commonly reported in rural areas and many studies of recent past have demonstrated the distribution of cases in villages predominantly. This trend has been observed in many regions of Northern India, Tamil Nadu and Maharashtra. [12, 13, 14, 15, 16] In our study also the majority patients were from villages 69(79%) while 18(20%) patients were from the urban region. Apart from the above scenario of the widespread distribution of the dengue infection across the urban and rural localities, one major factor for the rural predominance in our study, was the location of our center in a village area which contributes to the high number of rural patients.

The most common comorbid conditions seen in this study were Hypertension and Diabetes Mellitus with 10 patients having both these conditions. 4 patients were exclusively hypertensive and 3 patients were exclusively diabetic. Hypothyroidism, coronary artery disease, stroke, epilepsy, hepatitis C, COPD were also observed among the patients. No incidence of mortality was seen among this subset of patients however the mean duration of hospital stay in patients with co- morbidity was 6.15 ± 3.5 days while mean duration of hospital stay in patients without any co- morbidity was 4.40 ± 0.7 days. The difference being statistically significant ($p<0.05$).

In our study thrombocytopenia was the most common haematological derangement seen in almost all (99%) patients. 74 (85%) patients recorded platelet counts less than 50,000/cumm and among these 26 patients had platelet counts less than 20,000/cumm. Similar trend was seen in Dinkar et al study with 99% patients and Mandal et al with 100% patients showing thrombocytopenia. [5, 23] DV infection affects megakaryocytes and platelets during the disease course and it has been demonstrated by in vitro studies that dengue virus can inhibit megakaryopoiesis and cause cell death by apoptosis. There have been

certain structural changes like membrane re- organisation, auto-phagosome formation and endothelial cell process elongation in the dengue virus infected cells which contribute to the platelet destruction. [17, 18]

Bleeding manifestations were seen in 6 patients in our study in the form of epistaxis, gum bleeding, hematemesis, malena and hematuria. 5 of these patients had platelet counts less than 50000/cumm out of which 3 had platelets below 20000/cumm.

Leukopenia was seen in 51% of patients. Similar finding of leukopenia was observed in a study by Itoda et al in 71% of patients and by Ageep et al in 90% patients. [19, 20] Apart from that Leucocytosis was seen among 6% patients and anemia was observed in 19% of patients in our study.

Renal dysfunction was seen in 6% of patients while electrolyte abnormalities were seen among 21% patients with hypokalaemia being more common (11%) as compared to hyponatremia (9%). In a study by Singh et al renal dysfunction was seen in 5.5% patients while khan et al reported it in around 4% of their patients and Dinkar et al observed it in nearly 3% patients. [4, 5, 11]

Liver dysfunction was seen among 88% of patients in our study with one patient having transaminases raised to more than 10 times of ULN. More number of patients had raised AST (mean 416 IU/L) than ALT (mean 197 IU/L). This rise in hepatic enzymes is usually self-limiting and is mostly due to the direct hepatic injury or immune mediated response to the virus but it may have a risk of developing liver failure in some patients further complicating the disease course. [21]

In a study by Kularatne et al, 88% patients showed elevated ALT and AST. Similarly Mandal et al reported raised ALT in 70.27% patients while AST was raised in 83.78% [22, 23]

Shock was observed in 8% patients. Similar trends were observed in Singh et al with 8% and Khan et al with 7.3% patients having shock. [11, 4]

Dermatological manifestation in the form of rash was seen among 12% patients in our study. Out of these 6 patients had developed petechial rashes and 5 patients had maculopapular rashes. Itching was seen among 31% patients. The development of skin rash can be attributed to increased permeability of vessels which in turn causes dermal edema. Interaction of dengue virus with the host cells causes release and stimulation of cytokines leading to vascular endothelial alteration and subsequent peri-vascular edema. [23, 24]

About 16 (18%) patients presented with upper respiratory symptoms like cough, rhinitis and sore throat along with acute onset fever. In the past Singh et al reported 19% and khan et al reported 21% patients presenting with respiratory symptoms. [4,11] In our study all these were found to be Covid -19 negative but because these particular symptoms overlap with Covid so this set of patients must be carefully examined and kept under strict observation. Not only symptoms but the haematological profile of leukopenia, thrombocytopenia and raised transaminases increases the suspicion of Covid. So it becomes important to have early recognition and differentiation between these two viral diseases especially in the era of Covid-19 pandemic.

CONLCUSION

Dengue is not just a public health problem limited to urban areas but various studies show its penetration into rural localities making it a major public health challenge in villages also. Despite of being the cause of repeated epidemics of febrile illness in many parts of the world, there is no specific antiviral treatment or effective vaccine available against Dengue. Spread of dengue in the times of Covid-19 pandemic makes it even more dangerous as it significantly increases the burden on already stressed out public health and hospital resources and health care professionals, negatively impacts the economic growth of the region and contributes to the rise in the morbidity among the population.

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