ISSN: 0975-3583,0976-2833 VOL13, ISSUE 04, 2022

DENGUE FEVER: A PROSPECTIVE STUDY OF ITS CLINICAL AND LABORATORY FINDINGS

Purushottam Kumar[1], Sanjay Kumar[1], Ganesh Prasad Singh[2], Akriti Kumari[3],Kunal[4]

[1]Assistant Professor, Departmentof Medicine,BMIMS,Pawapuri,Nalanda, Bihar, India.
[2]Associate Professor,Departmentof Medicine, BMIMS, Pawapuri, Nalanda, Bihar, India.
[3]Senior Resident,Departmentof Biochemistry, BMIMS, Pawapuri, Nalanda, Bihar, India.
[4]Senior Resident, Departmentof Medicine, BMIMS, Pawapuri, Nalanda, Bihar, India.

Corresponding Author:
Dr.Kunal, Senior Resident, Department of Medicine, BMIMS, Pawapuri, Nalanda, Bihar, India.

Abstract:
Background: The incidence of Dengue has grown dramatically around the world in recent decades. Year after year, the prevalence of the disease is on arise. Aim: This study is designed to study the clinical and laboratory parameters of Dengue patients in a tertiary care teaching hospital. **Material and Methods:**Prospective observational study was undertaken in tertiary care teaching hospital. Seventy-two patients were studied and analyzed. All patients with positiveNS1 antigen and positive ELISA test were included in the study. Clinical, hematological and biochemical parameters were noted. **Results:**Of the 72 patients, majority were females (52.8 %). Fever was the most common symptom followed by other symptoms like head ache, myalgias etc. **Conclusion:**Dengue is an important cause of mortality and morbidity in our country. Early diagnosis and prompt management can have apositive effect on the outcome of the disease. Proper monitoring of the clinical and biochemical parameters and necessary intervention can bring down the mortality rates associated with this disease.
Keywords:NS1antigen,Flavivirus,Thrombocytopenia.

Introduction:

Dengue is one of the most common arthropod-borne viral illnesses in humans.Dengue infects approximately390million people per year. Dengue has recently become a majorpublic health problem in India causing significant morbidity, mortality and economic loss. There has been a recent resurgence of Dengue in India with wide variety of presentation.[1] This sudden emergence is due to unplanned urbanization and migration of population to urban areas. Dengue fever is caused by infection with one of the four serotypes of Dengue virus which is a single stranded RNAvirus of genus Flavivirus.[2]

The WHO 2009 classification divides Dengue fever into two groups: uncomplicated and severe.[3] The clinical presentation of Dengue fever is triphasic with febrile phase characterized by high fever, headache, myalgia, vomiting, joint pain, transient rash and mild bleeding manifestations.The Second phase is marked by progression to severe

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Denguecharacterizedbyplasmaleakageinducedshockandfluidaccumulations (ascites or pleural effusion) with or without respiratory distress, severe bleeding and organ impairment.
InfectionwithoneDengueserotypeconferslifelonghomotypic immunity to that serotype and a brief period of partial heterotypic immunity to other serotypes, but the patient can later be infected by all four serotypes.
Denguefevers are sometimes confusedwithChikungunya infection. Although these two diseases share similar clinical features, prominent and prolonged joint pains are more consistent with Chikungunya whereas hemorrhagicmanifestations are more common in Dengue. NS1 antigen detection may have higher sensitivity during the first fivedays after the onset of symptoms. Thereafter NS1 antigen levels decrease gradually and antibody detection tests havehigher sensitivityafterdayofinfection.[4,5]
Exact clinical and laboratory profile is crucial for diagnosis as well as successful management of the patients.In this study we evaluated patients with Dengue presenting tothe emergency department of our tertiary care hospital in a rural setting for clinical, hematological profile and management outcomes. This study is an attempt to elucidate the clinical and laboratory profile of serologically confirmed cases of Dengue fever in a tertiary care teaching hospital.

Material and Methods:

This prospective, observationalstudy was conducted at Department of Medicine, at Bhagwan Mahavir Institute of Medical Sciences, Pawapuri,Nalanda. The study was approved by institutional research and ethical research committee. Informed consent was taken from all the participants after explaining the study protocol before the commencement of the study. The study was conducted over a period from September 2020 to April 2022.
Seventy-two patients with confirmed Dengue fever cases admitted to tertiary care teaching hospital were included in this study.Patientspresentingwithsymptomslikefever,rash,myalgia,dyspnea,retro orbitalpain,seizures,painabdomenandbleedingmanifestationswereadmittedandfurtherevaluated .NS1Antigen,DengueIgMandIgGAntibodiespositivecaseswereincludedinthestudy.Commercia llyavailableonestepimmune-chromatography assay was done and a positive ELISA Test was used forconfirmationofcases.Patientswhohadscrub typhus,malaria and enteric fever were also included in this study. Acomplete blood count, liver function test, renal function test,chest x-ray, ultrasound abdomen and 2D echo tests were alsodone. Patientsbelow the age of 15were excluded from thisstudy.

Results:

A total of 72 cases admitted to our hospital were statistically analyzed. Most of the Dengue cases presented depicts the role of rainy season for case clustering during that season.
[Table1] shows that 38 (52.8 %) of the cases werefemalesand34(47.2%)weremales.25%of thepatientswere of the age group of 31-40 years. All patients included inthe study had fever which was the most common presentingsymptom (97.2%) followed by headache (62.5%), myalgias(41.7%),retroorbitalpain(31.9%),painabdomen(27.8%),vomiting(27.8%),dyspnea(15 .3%),skinrash(12.5%),jaundice (> 2.0 total bilirubin (2.8%), joint pains (1.4%)

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andseizures(1.4%).50ofthepatientshadcomplicationsofwhich most common was capillary leak (40.3%) followed byDenguehemorrhagicfever(22.2%),shock(6.9%)andencephalitis(1.4%). Ultrasoundfindingsnotedinthesepatients included dematousgallbladder(13.9%),hepatomegaly(9.7%),ascites(5.6%),pleural effusion(2.8%)andsplenomegaly (1.4%). Out of the 72 patients, NS1 antigen test was found tobepositivein46patients,IgGtestwaspositivein34patients,IgMtestwaspositivein21patients.Mixedinfection(i.e.scrubtyphusandmalariawithDenguepositive)wasnotedintenpatients. Laboratoryparametertestsrevealedleucopeniain40(55.6%) patients and elevated SGOT in 17 (23.6%) patientsandelevatedSGPTlevelsin12(16.7%)patients.

Table 1: AgeandSexdistributionofDenguefever

Age Group (inyears)	**Sex**		**Totalnoofpatients**
	Male	**Female**	
15–20yrs	1	3	4(5.6%)
21–30yrs	7	8	15(20.8%)
31–40yrs	8	10	18(25%)
41–50yrs	6	8	14(19.4%)
51–60yrs	9	4	(18.1%)
>60yrs	3	5	8(11.1%)
Totalno.ofpatients	34(47.2%)	38(52.8%)	72

Table 2: Presenting symptoms ofDenguefever

Presentingsymptom	**No.of patients**	**Percentage**
Fever	70	97.2%
Headache	45	62.5%
Myalgias	30	41.7%
Retro-orbitalpain	23	31.9%
Painabdomen	20	27.8%
Vomiting	20	27.8%
Shortnessofbreath	11	15.3%
Skinrash	9	12.5%
Jaundice	2	2.8%
Arthralgias	1	1.4%
Seizures	1	1.4%

Table 3: Complications of Dengue fever

Complication	**No.of patients**	**Percentage**
Capillaryleak	29	40.3%
Denguehaemorrhagicfever	15	22.2%
Shock	5	6.9%
Encephalitis	1	1.4%

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Table 4: Ultrasound findings of Dengue fever

Ultrasoundfinding	No.of patients	Percentage
Edematousgallbladder	10	13.9%
Hepatomegaly	7	9.7%
Ascites	4	5.6%
Pleuraleffusion	2	2.8%
Splenomegaly	1	1.4%

Thrombocytopeniawasseenin71patients.Ofthe71patientswiththrombocytopenia,13patientshad platelet count<1.5lakh,19patientshadplateletcountbetween50,000to 1.0 lakh and 39 patients had platelet count less than 50,000.Bleeding manifestations were seen in 12 patients (16.7%).Elevated serum Creatinine levels were noted in 6 patients(8.3%). Serum bilirubin levels > 1.2 levels were noted in 4patients (5.6%). 3 patients (4.2%) had abnormal PT and INRlevels.

Table 5: Laboratory findings of Dengue fever

Laboratoryfinding	No.of patients	Percentage
Thrombocytopenia	71	98.6%
Leucopenia	40	55.6%
IncreasedSGOTlevels	17	23.6%
IncreasedSGPTlevels	12	16.7%
IncreasedSerumCreatininelevels	6	8.3%
IncreasedSerumBilirubinlevels	4	5.6%
AbnormalPT&INRlevels	3	4.2%

Discussion

Dengue is an important cause of mortality and morbidity inourcountry. Itpresentswithawidevarietyofclinicalmanifestations.Severityoftheinfectioncanrangefrominfluenza-likeself-limitingillnesstolife-threateningcomplicationslikeDenguehemorrhagicfever(DHF)andDengueshocksyndrome.

Fever was the most common presentation (97.2%), whichisinunisonwithothersimilarstudiesfromSouthEastAsia.[4-6] Headache (6162.5%) and myalgias (41.7%) werethenexttwomostcommonfeatures/symptomsinthepatients.

LiverdysfunctioniscommoninDengueandSGOTlevelsareusuallyhigherthanSGPT.Serumbilirubinlevels>1.2 levels were noted in 4 patients (5.6%).Elevated serumCreatinine levels were noted in 6 patients (8.3%). Ascites,pleuraleffusion,pericardialeffusionandgall-bladderwalledemaarenotuncommoninbreakbonefever.Hepatomegaly,splenomegaly,ascitesand pleuraleffusionareusuallymildandsoarebetterdetectedbyultrasonography.InthisstudyUSGstudiesrevealed ascitesin5.6%and pleural effusionin2.8%ofthe patients.

ThrombocytopeniainDenguecanresultinoxidativestress.[7]39ofthepatientsinthisstudyhadplatelet countsless than 50,000. Bleeding diathesis is a known feature ofDengue fever because of low platelet count and leakage fromblood vessels.Bleeding manifestations were seen in 16.7% ofthecases.Rashesarecommonlyassociatedwithseverethrombocytopenia.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 04, 2022

RarebutseriousmanifestationsofDengueincloud encephalitis myocarditis,ARDS,shock, liverfailure.[8-10]Incidence of capillary leak, shock and encephalitis in thestudy was40.3%,6.9%and 1.4%respectively.

Conclusion:

Maximum numbers of cases are seen in rainy season as waterlogging is the source of breeding ground for mosquitoes.Prevention of mosquito breeding in the monsoons can lead tofallintheincidenceofDenguecasesinthisseason.Inviewof the increasing burden of Dengue on the public health-caresystem one shouldhave a high index of suspicion. Earlydiagnosis and prompt intervention may help in reducing themortalityandmorbidity.

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