A CLINICAL, LABORATORY AND RADIOLOGICAL PROFILE OF PATIENTS INFECTED WITH DENGUE FEVER- A HOSPITAL BASED OBSERVATIONAL STUDY

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ABSTRACT

BACKGROUND

Dengue is a mosquito borne infection and is a major public health concern around the world. There has been a rapid increase in the infection rate and nearly 400 million people across the globe are at risk of dengue infection. This infection is caused by dengue virus (DENV) which is a member of the genus flavivirus of the family flaviviridae, and is a single-stranded positive sense RNA virus. There are four DENV serotypes (DENV 1-4) found in tropical and subtropical regions of the globe DENV cycles between the vectors viz; Aedes aegypti, Aedes albopictus and human beings.

MATERIALS AND METHODS

This observational study was carried out at R L Jalappa hospital the teaching hospital of Sri Devaraj Urs Medical College, Tamaka, Kolar, Karnataka. The study period was from October 2016 to January 2017. A total of 72 patients who were diagnosed as dengue fever who met the inclusion and exclusion criteria were enrolled in this study.

RESULTS

The number of male patients was 49 contributing to 68% and the number of female patients was 23 contributing to 32%; maximum were in the age range of 26 to 45 years (70.8%). With highest number of patients presenting with fever and pain abdomen (n=32) as the most predominant clinical presentation followed by fever and breathlessness (n=12). Hepatomegaly has been the most predominant clinical sign followed by icterus and petechiae. Dengue serology results indicated that out of the 72 patients, 55 patients were positive for NS1Ag (76.3%), 10 patients had IgM positivity (13.88%) and 7 patients had IgG positivity (9.7%). Ultrasound abdomen showed findings of thickened and oedematous gall bladder (n=53, 73.6%), free fluid in abdomen (n=32, 44.4%) and hepatosplenomegaly (n=43, 59.7%).

CONCLUSION

The present study suggests that fever with abdominal pain could be one of the presenting symptoms among the patients infected with dengue virus and a radiological evaluation might be of relevance in medical management of dengue infection.

KEYWORDS

Flavivirus, Dengue Fever, Dengue Haemorrhagic Fever, Clinical Profile.

BACKGROUND

Dengue is a mosquito borne infection and is a major public health concern around the world. There has been a rapid increase in the infection rate and nearly 400 million people across the globe are at risk of dengue infection.[1,2] This infection is caused by dengue virus (DENV) which is a member of the genus flavivirus of the family flaviviridae, and is a single - stranded positive sense RNA virus. Each year

approximately 400 million people are at risk of infection with dengue virus with one fourth of them developing clinical symptoms of infection and severe forms of this result in around 25,600 deaths.[3]

There are four DENV serotypes (DENV 1-4) found in tropical and subtropical regions of the globe DENV cycles between the vectors viz; Aedes aegypti, Aedes albopictus and human beings.[4] All the four forms of DENV serotypes are seen in India and among the four, DENV 1, 2 and 3 are wide spread.[5]

Clinically dengue can be classified into – mild, moderate and severe infection based on the signs and symptoms. All the symptoms and signs are manifested by capillary leakage, impairment of coagulation profile, bleeding or organ involvement.[6]

Mild dengue infection is characterized by undifferentiated Dengue fever i.e. fever without complications like bleeding, hypotension, organ involvement or any evidence of capillary leakage. Moderate dengue infection is characterized by the presence of fever with warning signs such as like recurrent vomiting, abdominal pain or tenderness lethargy, restlessness, minor bleeding, pleural effusion or ascites, hepatomegaly and increased haematocrit. Severe dengue infection these patients are recognized by the presence of shock, capillary leakage, significant bleeding and multiple organ involvement.[6]

Thus, diagnosis of dengue into mild, moderate and severe infection is crucial in the successful management of the infection. There are large number of studies, providing information on the varied clinical and laboratory profiles with dengue infection. Each study has contributed to the clinical profiles presented by the infected patients. This study is conducted in a tertiary care hospital, which attempts to analyse the spectrum of clinical features presented by patients infected with dengue virus.

MATERIALS AND METHODS

This observational study was carried out at R L Jalappa hospital the teaching hospital of Sri Devaraj Urs Medical College, Tamaka, Kolar, Karnataka. The study period was from October 2016 to January 2017. A total of 72 patients who were diagnosed as dengue fever were enrolled in this study. The Inclusion Criteria were both male and female patients of age 18 years and above and patients who meet the clinical criteria for dengue infection (according to WHO 2009 guidelines).[7] Patients with co-morbidities such as - hypertension, diabetes mellitus, hepatitis, chronic kidney disease, respiratory disorders like tuberculosis, chronic obstructive lung diseases, bronchial asthma, lung malignancies and gastrointestinal or any disorder with platelets less than 1,50,000 as an incidental finding, patients with co-infections such as malaria, typhoid, leptospira and rickettsia were excluded from the study.

Detailed history and careful clinical examination were performed on each patient. History included age and sex, fever, headache, vomiting, abdominal pain, myalgia, arthralgia, breathlessness, epistaxis, blood in stools, blood in urine, blood in sputum, menorrhagia.

The patient was examined for signs like pallor, icterus, conjunctival congestion, presence of rashes over the body, signs of bleeding manifestations like petechiae, purpura, ecchymosis. Low blood pressure, cold and clammy peripherals. Patients were also examined for hepatomegaly, splenomegaly, pleural effusion and presence or absence of acute respiratory distress syndrome.

Investigation that were performed included complete hemogram, dengue serology, ultrasound scan of abdomen and chest radiography. Blood counts were periodically monitored. This study was approved by the institutional ethical committee of Sri Devaraj Urs Medical College, Kolar, Karnataka. Informed consent was obtained from each patient.

RESULTS

The gender distribution of the 72 dengue patients investigated in the study is presented in table 1. The number of male patients were 49 contributing to 68% and the number of female patients were 23 contributing to 32%.

No. of Patients	Male	Female
72	49	23
Table 1. Gender Distribution among the Subjects		

The age distribution of the 72 patients included in the study is presented in table 2 .The age groups that were studied were in the age range of 18-25 years, 26-45 years and 46-65 years, maximum were in the age range of 26 to 45 years (70.8%) with 15.2% in the age group of 45-65 years and 13.8% in the age group of 18-25 years and represented by both males and female patients in the ratio of 3:2.1 respectively.

Age Range (Years)	Male	Female	Total
18-25	10	0	10
26-45	30	21	51
46-65	9	2	11
Total	**49**	**23**	**72**
Table 2. Age Distribution among Dengue Patients			

The spectrum of clinical presentations are detailed in table 3 which included fever alone (13.8%), fever with pain abdomen (44.4%), fever with breathlessness (16.66%), fever with vomiting (11.11%), fever with myalgia (8.3%), fever with joint pain (5.55%). With highest number of patients presenting with fever and pain abdomen (n=32) as the most predominant clinical presentation followed by fever and breathlessness (n=12).

Chief Complaints	Male	Female	Total
Fever alone	8	2	10
Fever + pain abdomen	24	8	32
Fever + breathlessness	8	4	12
Fever + vomiting	7	1	8
Fever + myalgia	1	5	6
Fever + joint pain	1	3	4
Total	**49**	**23**	**72**
Table 3. Clinical Presentations in the Dengue Patients			

The clinical signs that ellicited in the patients were: Pallor (23.6%), icterus (59.7%), rashes (44.4%), petechiae (55.5%), hepatosplenomegaly (59.7%), pleural effusion (11.1%), tourniquet test (53.2%), ARDS (12.5%). hepatomegaly has been the most predominant clinical sign followed by icterus and petechiae.

Complete hemogram was performed in all the 72 patients, 12 had anemia (16.6%), 21 had leukopenia (29.1%) and 64 had thrombocytopenia (88.8%). Dengue

serologyresults indicated that out of the 72 patients 55 patients were positive for NS1Ag (76.3%), 10 patients had IgM positivity (13.88%) and 7 patients had IgG positivity (9.7%) as depicted in table 4.

Serology	Male	Female	Total
NS1Ag	35	20	55
IgM	8	2	10
IgG	6	1	7
Total	49	23	72
Table 4. Profile Of Dengue Serology in the Patients			

Other investigations included chest x-ray and ultrasonography of the abdomen depicted in figure 1. Of the 72 patients, 45 patients (62.5%) showed pleural effusion on chest x-ray. And ultrasound abdomen showed findings of thickened and oedematous gall bladder (n=53, 73.6%), free fluid in abdomen (n=32, 44.4%) and hepatosplenomegaly (n=43, 59.7%).
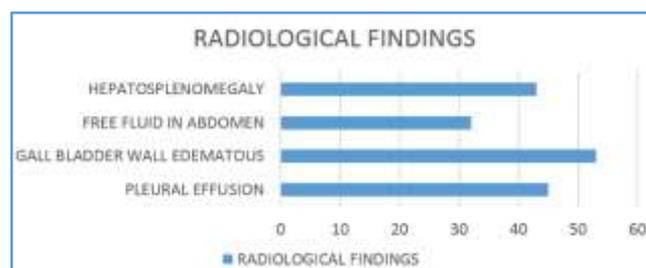

Figure 1. Radiological Findings among Dengue Patients

DISCUSSION

In the present study there were 49 males and 23 female patients. It was observed that, maximum number of patients were in the age group of 26 to 45 years. All the patients presented with fever which was universal. Fever alone as a complaint was seen in 10 patients (13.8%) while in others the fever was accompanied by other symptoms such pain abdomen (44.4%), breathlessness (16.66%), vomiting (11.11%), followed by myalgia (8.3%) and joint pains in (5.55%) of the cases. Fever with myalgia and joint pains were the least recorded symptoms. The most common presentation was fever which was in agreement with other studies.[8,9] Other symptoms such as headache, myalgia, nausea, vomiting, retro-orbital pain and bleeding tendencies were seen in majority of the studies[10,11,12,13] as the presenting symptoms. A close analysis of the presenting symptoms in various studies provided a heterogenous picture indicating that it could vary in various study populations. In the present study the most common clinical symptom was pain abdomen. Out of the 72 patients, 32 patients complained of pain abdomen.

With regard to the signs that were elicited and reported in various studies included pallor, icterus, dehydration, rashes, petechiae, hepatosplenomegaly, pleural effusion and acute respiratory distress syndrome.[14,15,16] In this study we were able to elicit similar signs the most common signs were

in the order of - icterus 59.7%, hepatosplenomegaly in 59.7%, petechiae 55.5%, rashes 44.4%, pallor 23.6%, ARDS 12.5% and pleural effusion 11.1%. Positive tourniquet test was seen in 53.2% cases. Bleeding manifestations were in the form of petechiae, without any bleeding from gums, haematuria and haemoptysis.

Out of the 72 patients 55 patients were positive for NS1Ag (76.3%), 10 patients had IgM positivity (13.88%) and 7 patients had IgG positivity (9.7%). It was seen that most pateints were positive for NS1Ag which showed that there was an ongoing acute dengue infection. In serological diagnosis of dengue NS1 antigen has been shown to play an important role to diagnose the diease in early days.[17] NS1Ag detection have been shown to have higher sensitivity during the first 5 days after the onset of the symptoms and thereafter NS1Ag declines with a concomitant increase in the antibodies thereafter.[18] The presence of the NS1 antigen in the blood stream produces a very strong humoral response. The data on the serology of dengue patients indicated that most of the patients in the study group were brought to the hospital in the early stages of dengue infection as 76.3% of the patient population presented with NS1Ag positivity, the results on the NS1Ag thus reiterates the utility of its detection as a diagnostic marker during the acute phase of dengue infection.

In our study, out of 72 patients, 32 complained of fever with pain abdomen which formed 44% of the study group and it was seen as the chief complaint which warranted the need for a radiological assessment of the abdomen using ultrasonography. The result of which were consistent with complaints in the form of thickened and oedematous gall bladder (n=53, 73.6%), free fluid in abdomen (n=32, 44.4%) and hepatosplenomegaly (n=43, 59.7%). One important observation in this study was patients complaining of pain abdomen. There are not many studies reporting pain abdomen as the major complaint in the south Indian population. The observations of oedematous and thickened gall bladder and hepatosplenomegaly were in concordance with the other studies.[19,20]

Apart from pain abdomen, the patients complained of fever with breathlessness as the next common chief complaint, which necessitated the need for chest x-ray, which revealed pleural effusion in 45 patients. The overall radiological findings were in the order of gall bladder wall oedema, hepatosplenomegaly, free fluid in abdomen and pleural effusion. These observations were suggestive of the need for radiological evaluation of patients infected with dengue as a routine clinical investigation.

CONCLUSION

The present study suggests that fever with abdominal pain could be one of the presenting symptoms among the patients infected with dengue virus and a radiological evaluation might be of relevance in medical management of dengue infection.

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