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Original Article

Internal Medicine Section

The Changing Clinical Spectrum of Dengue Fever in the 2009 Epidemic in North India: A Tertiary Teaching Hospital Based Study

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ABSTRACT

Introduction: Dengue fever epidemics have been causing major concerns in India since the last two decades. Many parts of India, including the north regions, are now endemic for the Dengue infection. This retrospective study was conducted in a tertiary teaching hospital in north India to determine the changing trends of the clinical features in the Dengue patients of this region in the recent years.

Materials and Methods: A retrospective study of four months was conducted on 309 cases who presented with fever, who were suspected as Dengue fever cases and they were admitted in the study. A detailed history and the clinical examination findings were recorded and all the cases were subjected to laboratory investigations which included a complete haemogram, a liver function test, a kidney function test and serological tests. All the patients were treated symptomatically.

Result: Among the 309 suspected Dengue patients, the male: female ratio was 2:1. The Dengue serology was studied for all the cases and only 34 cases were found to be positive (male: female =1.6:1). On clinical examination, a maculo-papular erythematous rash was found to be present in 69% cases and petechiae were present in 38% of the cases. 8% of the cases showed a tendency for spontaneous bleeding. Among these 8% cases with a bleeding tendency, 9 interesting cases showed normal platelet counts and prothrombin times. Renal failure, an altered sensorium, pleural effusions and shock developed in 4, 1, 1 and 1 cases respectively. A platelet count of <1,00,000/cmm was found in 84% cases and 26% cases had a platelet count of less than 20,000/cmm, out of which 20% cases had platelet transfusion. The haemoglobin reduction was not significant in most of the cases and 57 % of the cases showed elevated liver enzymes. 21 cases (6.79%) showed hepatomegaly and splenomegaly was present in 28 cases (9.06%).

Conclusion: This study showed slight differences in the clinical profile and the course of illness as compared to the findings of previous studies from the same region, thus indicating a need for the early identification of the Dengue cases to prevent further complications and mortality in the future.

Key Words: Dengue fever, Altered sensorium, Macula-papular erythematous rashes

INTRODUCTION

Dengue fever has been known to be endemic in India for over two centuries as a benign and self-limited disease. In recent years, the disease has changed its course, manifesting in its severe form as DHF (Dengue Haemorrhagic Fever), with increasing frequencies [1]. The Delhi city (India) is home to more than 13 million people and it is endemic for the DI (Dengue infection) [2]. Overpopulation has consequently led to poor sanitary conditions and water logging at various places.

Since 1997, Delhi, a city in north India, has experienced seven major epidemic outbreaks of the Dengue virus infection, with the last being reported in 2003 [3,4]. Since then, Dengue has been rampant in north India, also in the rural areas, probably due to the high population density and other factors [5]. Besides the presence of an increased frequency of the Dengue infection in north India, the clinical profile is also very much varied. In 2009, the clinical manifestations which were shown by the patients were slightly different and they had not been observed commonly in the previous year's epidemics from the same region. Through the present retrospective study, we are presenting the varied clinical manifestations of the Dengue patients who had been admitted in a tertiary teaching hospital in north India.

MATERIALS AND METHODS

This retrospective study was conducted over a period of 4 months, from August 2009 to November 2009, in a tertiary care teaching hospital which was situated in a rural part of north India.

All the patients who presented with fever for two to seven days, which was accompanied by headache and vomiting, were suspected to have Dengue and they were included in the present study. A detailed history was taken and a careful clinical examination was performed on all the suspected cases.

The laboratory investigations which were performed on a majority of the patients included haemoglobin (Hb), the total and the differential leucocyte counts (TLC and DLC), platelet count, haematocrit (Hct), liver function tests (LFT) which included serum albumin, serum protein and the prothrombin time and the renal function tests (KFT). The case definition of Dengue/ DHF/DSS (Dengue shock syndrome) which was followed in the present study was that which was recommended by the WHO [6] i.e. An acute febrile illness of two to seven days duration with two or more of the following manifestations-headache, retro-orbital pain, myalgia, arthralgia, vomiting, rash, haemorrhagic manifestations and leucopaenia. All the patients were treated symptomatically and

the serological test was performed on all the suspected cases. The SD BIOLINE Dengue NS1 Ag + Ab combo rapid card test kit consists of two devices; one for the detection of the Dengue NS1 antigen and the second for the differential detection of the Dengue IgG and IgM antibodies in the human serum/plasma.

Out of the 309 patients, 208 were males and 101 patients were females. A majority of the patients were from the adult age group [>15 years (302 cases)] and few were from the paediatric age group [<15 years (7 cases)]. A majority of the patients were from the 15-44 years age group (213 cases) [Table/Fig-1].

This study was approved by the institutional ethical committee.

RESULTS

During the period of the study, one outbreak of the Dengue infection occurred and a total of 309 (M=208 and F= 101) patients were suspected to have the Dengue infection [Table/Fig-1]. 95.5 % (295) cases were from the rural areas. Out of the 309 patients who were tested for the Dengue serology, only 34 cases were found to be positive for the Dengue virus by the rapid card test (NS1 Ag and IgG and IgM Ab) (males= 21 and females=13).

Distribution by Age

Out of the 34 serologically positive cases, 21 cases were males and 13 cases were females. Among the males, 11 cases were from the 15-44 years age group, 6 cases were from the 45-59 years age group, 2 cases were from the >60 years age group and 2 cases were from the paediatric age group (≤ 15 years) in this study. Among the females, 9 cases were from the 15-44 years age group and 4 cases were from the 45-59 years age group. Larger proportions of serologically positive cases were observed among the adults, with a positive prevalence of 94.11%.

Dengue-specific antibody positive cases were mainly reported during the post monsoon period, with the maximum number of cases 160 (51.77%) being reported during the month of October, followed by 90 (29.12%) cases in November, 45 (14.56%) cases in September and 14 (4.53%) cases in August [Table/Fig-4].

Fever was the most common clinical presentation which was found among all the presenting patients (100%).The fever was of a mild to moderate degree in a majority of the patients and it had no specific pattern. The other main complaints besides fever were vomiting, nausea, rash, petechiae, itching, myalgia and upper abdominal pain [Table/Fig-2].

On clinical examination, a maculo-papular erythematous rash was found to be present in 212 (69%) cases and petechiae were present in 118 (38%) of the cases. 25(8%) cases showed a tendency for spontaneous bleeding. The gastrointestinal tract was the most common site for the bleeding in 17 patients, followed by epistaxis (3 cases) and episodes of haemoptysis (5 cases). Among these 25 cases who had the bleeding tendencies, 9 interesting cases showed normal platelet counts and prothrombin time. Renal failure, an altered sensorium, pleural effusions and shock developed in 4, 1, 1 and 1 cases respectively.

A platelet count of <1,00,000/cmm was found in 261 (84%) cases and 81 (26%) cases had a platelet count of less than 20,000/cmm, out of which in 63 (20%) cases had platelet transfusion [Table/Fig-3]. Haemoglobin was mildly reduced in most of the cases and 57% cases showed elevated liver enzymes.

All the patients who were suspected to have the Dengue infection were admitted. The average duration of their hospital stay was

Serial No.	Age group (yrs)	Male	Female	Total
1.	< 15	5	2	7
2.	15-44	138	75	213
3.	45-59	53	21	74
4.	>60	12	3	15
Total		208	101	309

[Table/Fig-1]: The age distribution of the dengue suspected cases

Symptoms	No. of patients	Percentage
Fever	309	100%
Myalgia	69	22%
Rash	212	69%
Itching	74	24%
Upper abdominal pain	61	20%
Vomiting, nausea	226	73%
Headache	28	9%
Haematemesis	14	5%
Haemoptysis	5	2%
Malaena	3	1%
Spontaneous Bleeding	25	8%
Epistaxis	3	1%
Hiccups	3	1%
Generalized weakness	14	5%
Asthenia/paraparesis	1	0.3%
Cough	5	2%
Altered sensorium	1	0.3%
Shock	1	0.3%
Loose motion	2	1%
Pleural effusion	1	0.3%
Ascitis	1	0.3%
Splenomegaly	28	9%
Hepatomegaly	21	7%
Petechiae	118	38%
Renal failure	4	1%

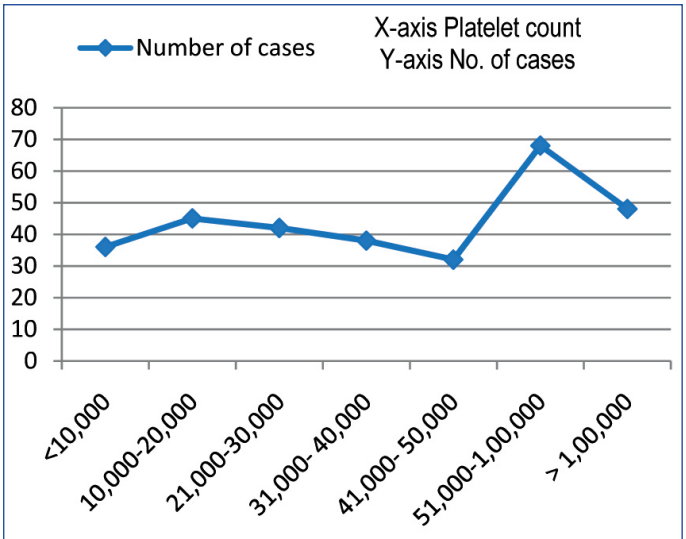
[Table/Fig-2]: The clinical features of the suspected dengue cases

Sr. No.	Platelet count /cmm	Number of cases	% of cases
1.	<10,000	36	12%
2.	10,000-20,000	45	15%
3.	21,000-30,000	42	14%
4.	31,000- 40,000	38	12%
5.	41,000- 50,000	32	10%
6.	51,000-1,00,000	68	22%
7.	> 1,00,000	48	16%
Total		309	

[Table/Fig-3]: Profile of platelet count in dengue suspected cases

Month	Total no. of patients (309)	Seroposive patients (34)
August	14	1
September	45	4
October	160	20
November	90	9

[Table/Fig-4]: Month wise distribution of serologically positive cases



[Table/Fig-5]: Profile of platelet count in dengue suspected cases

10-14 days. The average duration of the fever was found to be 7-10 days. No mortality was reported during the study.

DISCUSSION

Dengue is emerging as a major health problem in India. Since the first epidemic in 1963–64 in Kolkata, many places, including the rural areas of north India, have been experiencing regular outbreaks of the Dengue infection. In the present outbreak in our hospital, the Dengue cases showed varied clinical presentations which are different from those which were reported in previous epidemic cases.

The epidemic of Dengue fever has been reported in every 2-3 year interval in north India. This (the 2009 outbreak) as well as the previous outbreaks in north India have usually shown a seasonal trend and they have been reported in the post monsoon season, which can be explained by the increased mosquito breeding due to the increased humidity and temperature during these days [8,9]. Our study, in accordance with the study which was conducted by Chakravarti A and Kumaria R, showed that a majority of the patients were diagnosed with the Dengue infection in the months of October and November than in August and September [Table/Fig-4].

Our study also showed a male preponderance, which was similar to the findings of other studies from India and this could be explained by the more outdoor activity of the males as compared to the females, which might have caused more mosquito bites [8, 10].

In our study, only 34 patients were found to be serologically positive. This is mainly because diagnosing Dengue early is challenging, as the initial symptoms of the Dengue infection are often non-specific and as the serological tests, which are the mainstay of the current laboratory diagnosis, confirm Dengue late in the course of the illness [11]. The early detection of DENV is not always possible due to the transient, low levels of the viraemia.

As regards to the clinical presentations, this epidemic showed only few differences from those of the previous outbreaks. A mild to moderate degree fever has been the most consistent finding in all the epidemics, which had an average duration of 5-7 days [6,12,13,14]. In our study also, fever was the most common presentation, but the average duration of the fever was longer (with an average of 10 days) than that in the previous reports.

Rashes, abdominal pain, myalgia, headache and vomiting constituted the main clinical manifestations, which were similar to that which were seen in other studies [13, 15]. Our findings were in accordance with those of a study which was conducted in Pakistan, that showed that all the cases presented with fever (100%). Skin rashes appeared in 83.33% of the patients, 1–6 days after the onset of the fever [7].

25 cases presented with spontaneous bleeding and similar findings were reported by other studies also [16, 17]. Among these bleeding cases, 9 interesting cases showed bleeding tendencies despite them having normal platelet counts and prothrombin times, probably due to the altered platelet function which is found in the Dengue infection. Some other studies have also reported similar results [18- 20].

Although hepatomegaly was described as common clinical presentation of Dengue by the WHO, splenomegaly is not generally a feature of the Dengue infection. But in our study, 28 cases presented with mild to moderate splenomegaly. A recent report from Delhi also showed a higher percentage of splenomegaly in children [20]. Earlier reports from the north as well as from other parts of India had not shown a high percentage of splenomegaly in the Dengue cases [4, 14, 15, 18, 21, 22, 23].

Among the laboratory findings, a majority of the cases were found to show <1,00,000/cmm platelets (84%) [Table/Fig-3]. Anaemia was not the major clinical feature, but 57% cases showed elevated liver enzymes. Elevation in the liver enzymes is well known in Dengue infections [24, 25, 26, 27, 28] but the WHO [6] has not listed liver enzyme elevation as a major criterion for the case definition of Dengue fever [Table/Fig-5].

In our study, the serological diagnosis of Dengue was based on the identification of either the Dengue NS1 Ag or the presence of the IgM and the IgG Abs or both; hence, only few cases showed serological positivity. However, in the present study, all the cases were clinically suspected to be Dengue fever and they responded accordingly.

All the patients were treated symptomatically and all improved, with no mortality.

CONCLUSION

To conclude, the clinical profile of the Dengue fever cases is changing in different epidemics, even in the same regions as well as with the period of time. The present study thus indicated the need for a continuous sero-epidemiological surveillance for the early and definite identification of the clinical features of the Dengue infection, to prevent further complications, mortality and outbreaks in the future. This study has the limitations which are inherent to a hospital record based study and it should be supported by a larger, detailed study.

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