RESEARCH ARTICLE

SCREENING AND MANIFESTATIONS OF SEROPOSITIVE DENGUE FEVER PATIENTS IN PERAMBALUR: A HOSPITAL BASED STUDY

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ABSTRACT
Background: Dengue infection is the most important one in terms of morbidity and mortality. If the illness is not identified early in the course and not treated promptly when indicated, case fatality rate of DHF can go over 20% and that of DSS can be as high as 44%.
Aims & Objective: To study the manifestations of seropositive dengue fever patients at tertiary care hospital Perambalur. Also to assess indicators associated with poor prognosis (DHF and DSS) for early recognition of complications.
Materials and Methods: The present cross sectional study was conducted on 60 hospitalized adult patients during the period of one year. All Patients were assessed for clinical presentation and closely observed with investigations for the progression disease and complications. MAC capture ELISA for IgM, IgG capture ELISA and NS1 antigen by sandwich ELISA were used for investigation.
Results: In the present study out of total 60 patients, more number of DF patients i.e. 33 (55%) were found followed by 19 (31.67%) of DHF cases and 8 (13.33%) of DSS cases. There were 61% secondary infections in our study. The common symptoms in the present study were 60 (100%) fever in all patients followed by 48 (80%) headache.
Conclusion: Dengue fever infection was found more in younger age groups. The factors significantly associated with poor prognosis group (DHF/DSS) were anorexia, altered mentation, conjunctival injections, anaemia with Hb <10mg%, haemoconcentration with haematocrit > 40, thrombocytopenia and deranged liver enzymes SGOT.
Key Words: Screening; Manifestations; Poor Prognosis

Introduction

Dengue is the most common arbo-virus in the world especially affecting urban and peri-urban areas and also the most important one in terms of morbidity and mortality.[1] Dengue contributes to economic burden on the society and nation, as the average hospital stay is approximately 5 to 20 days.

The disease manifestations range from a flu like illness as dengue fever (DF) to a severe and at times fatal disease characterized by haemorrhages and/or shock, known as dengue haemorrhagic fever (DHF)/dengue shock syndrome (DSS).[2] Tamil Nadu recorded more than one fourth of all dengue cases and deaths in the country i.e. 9,249 dengue cases and 60 deaths in 2012.[3]

By natural history of Dengue infection, there is a danger that this infection might increase every year in the next few years. Also it is believed that the reported patients of dengue are an under representation of all patients of dengue as it would ignore sub-clinical patients and patients where the patient did not present for medical treatment. If the illness is not identified early in the course and not treated promptly when indicated, case fatality rate of DHF can go over 20% and that of DSS can be as high as 44%.[4,5]

The present study was undertaken for screening and manifestations of Dengue fever. Also to assess indicators associated with poor prognosis (DHF/DSS) for early recognition of complications. It would help to control of morbidity and mortality.

Materials and Methods

The present cross sectional prospective study was conducted on 60 hospitalized patients during the period of one year from 2013 to 2014. The selection of patients for study was as per WHO guideline 2009, with serological evidence by MAC capture ELISA for IgM, IgG capture ELISA and NS1 antigen detection by sandwich ELISA.[6]

Specimen Collection: The human serum or plasma samples should be used for the test. Specimens should be free of microbial contamination and stored at 2-8°c for 1 week or frozen at -20°c. Heat inactivated sample should not be used.

NS1 Ag Micro ELISA: The Cut off value calculation was mean OD of calibrator × calibration factor. Interpretation of results were as if NS1 antigen units is <9 negative, if 9-11 equivocal and >11positive.

MAC Capture ELISA for IgG / IgM: The Cut off value was mean OD of calibrator × calibration factor. Interpretation of results were as if NS1 antigen units is <9 negative, if 9-11 equivocal, >11positive. Cut off value calculation = mean OD of calibrator × calibration factor.

Study Procedure: Patients were assessed for clinical manifestation and progression of fever, blood pressure, level of consciousness, hydration, and bleeding tendency. The complications at any stage of dengue disease were studied. The patients were subjected to routine laboratory tests like haemoglobin (Hb), total leukocyte count (TLC), haematocrit, platelet count, liver function tests, renal function tests (RFT), urine routine and microscopy and peripheral smear for malarial parasite. Patients whenever indicated underwent chest x-ray and ultrasound examination of the abdomen to study the different radiological features of dengue fever. In some patients special investigations like CT scan, HBsAg for hepatitis Band rapid malarial test were done.

The data was analysed by using Epi info 3.5.1 software package. Chi-square test was applied on DF group and poor prognosis group i.e. DHF and DSS. The P values less than 0.05 were taken as statistically significant.

Results

In the present study out of total 60patients, more number of DF patients i.e. 33 (55%) were found followed by 19 (31.67%) of DHF cases and 8 (13.33%) of DSS cases. The common age group 21 to 40 years was affected in 27 (45%) cases and the median age of patient was around 30 yrs. Primary infection with IgM positive was 23 (38.33%) patients in the present study. Secondary infection with IgM and IgG both were positive in 29 (48.33%) patients and only IgG positive in 8 (13.33%). These amounted that were 61% secondary infections in our study.

The common symptoms in the present study were 60 (100%) fever in all patients followed by 48(80%) headache. The variables like anorexia, cough, conjunctivitis and altered Mentation were significantly associated with poor prognosis (DHF/DSS) as compared to DF cases (p<0.05). The bleeding was observed in 25 (41.67%) patients. The common types of bleeding were petechiae in 16cases followed by gastrointestinal bleeding in12 cases whereas 11 haematuria, 10 bleeding and 7 epistaxis. However, in DHF cases petechiae common were in 14 patients followed by haematuria in. In DSS cases gastrointestinal bleeding was the commonest in 5 followed by petechiae in 2.

Table-1: Distribution of symptoms in different groups of dengue infections

Symptoms	DF (n=33)	DHF (n=19)	DSS (n=8)	Total (n=60)	Poor Prognosis (n=27)	DF Vs. Poor Prognosis	
						χ^2	P
Fever	33	19	8	60	27	-	-
Headache	29	12	7	48	19	2.85	0.09
Rash	07	14	2	23	16	1.56	0.21
Myalgia	32	16	7	55	23	2.7	0.24
Arthralgia	27	14	5	46	19	1.09	0.30
Abd. Pain	08	17	4	29	21	3.50	0.06
Fatigue	32	18	8	58	26	0.02	1
Oliguria	00	05	3	8	08	-	-
Anorexia	17	16	8	41	24	9.59	0.00*
Cough	06	08	4	18	12	4.88	0.03
Conjunctival injection	12	17	5	43	22	6.83	0.01*
Retro orbital Pain	19	18	3	40	21	1.29	0.26
Nausea/ Vomiting	30	15	8	53	23	0.47	0.77
Altered Mentation	03	15	7	25	22	9.07	0.00*

* Statistically significant p value. χ^2 = Chi –square test value

Table-2: Distribution of Laboratory investigations in different groups of dengue infections

Laboratory Tests	DF (n=33)	DHF (n=19)	DSS (n=8)	Total (n=60)	Poor Prognosis (n=27)	DF Vs. Poor Prognosis	
						χ^2	P
Hemoglobin (<10)	8	16	3	27	19	12.77	0.00*
Hematocrit (>40)	2	13	3	18	16	8.71	0.00*
Proteinuria	8	8	3	19	11	0.01	0.93
Platelet (<1 lakh)	12	17	7	36	24	17.07	0.00*
Sr. Bilirubin (> 1.5 mg %)	4	9	1	14	10	1.13	0.29
Alk. Pho. (>100u/l)	3	4	1	08	05	0.05	0.82
SGOT(>40u/l)	6	16	4	26	20	5.25	0.02*
SGPT (>40u/l)	5	9	4	18	13	1.74	0.19
Deranged RFT	0	7	6	13	13	-	-
Leukocytosis	2	4	2	08	06	0.97	0.32
Leucopenia	12	12	0	24	12	10.08	0.30
Proteinuria	8	8	3	19	11	0.01	0.93

* Statistically significant p value. χ^2 = Chi –square test value

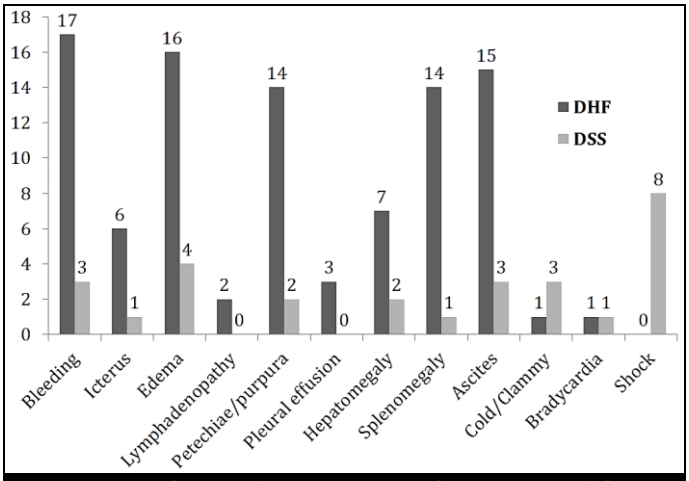

Figure-1: Distribution of signs in DHF and DSS groups of dengue infections

The ascites was commonest finding in 23 (38.33%)

patients, of which 15 (65.22%) in DHF whereas 8 (34.78%) in DSS. Haemoglobin less than 10gm% was predominant in 16(26.67%) of DHF cases. Anaemia was significantly associated with poor prognosis (DHF/DSS) than DF cases (χ^2 = 12.77; df = 1; p <0.05). Haemoconcentration i.e. haematocrit of >40 was found in 18 (22.5%) patients, most of which belonged to the DHF/DSS i.e. 16 (88.89%). The association between haemoconcentration and poor prognosis (DHF/DSS) is statistically significant (χ^2 = 8.71; df = 1; p<0.05).

Thrombocytopenia i.e. platelets <1 lakh occurred in 36 (60%) patients and serum bilirubin of >1.5 mg% was found in 14 (23.23%). Thrombocytopenia was significantly associated with poor prognosis (DHF/DSS) (χ^2 = 17.07; df = 1; p<0.05). Association between poor prognosis and deranged liver enzyme (SGOT) is statistically significant, (χ^2 = 5.25; df = 1; p<0.05). Deranged renal function (RFT) i.e. serum creatinine >1.2 mg% and blood urea >50 mg%, was found in 13 (5%) patients. Of this 7 (53.85%) were in DHF patients remaining 6 (46.15%) in DSS. Leucopoenia was found in 24 (40%) patients and proteinuria was present in 19 (31.67%) patients.

Of 38 patients who underwent X-ray, showed suggestive picture of pleural effusion in 3 (7.89%) patients, pneumonia in 8 (21.05) patients and ARDS like features in 2 (5.26%) patients. Whereas 40 dengue patients who underwent USG, most common finding was Ascites in 7 (17.5%) followed by splenomegaly with ascites in 6 (15%) and (hepatomegaly + splenomegaly + ascites) in 4 (10%).Based on clinical and laboratory parameters most common organ failure was kidney in 12 (20%) patients followed by lung (pneumonitis) in 11 (18.33%) and liver failure in 10 (16.67%). In the present study, mortality rate was 7 (11.67%).

Discussion

In our study, there were 55% DF, 31.67% DHF patients, and 13.33% DSS. Ratgeri et al found that DF cases were 18% patients; DHF in 60% and DSS in 22%.[7] The median age of patients in present study was 30 years which was more than Sharma S et al i.e. 26.3 yrs.[8] Our observations were in accordance with Doke et al as maximum number of patients occurred in age group 15-44 years.[9] In the present study there were 61% secondary infections while Shah et al showed 85% secondary infection.[10]

In the present study maximum patients admitted in the rainy season (August to October) may be related to favourable conditions for growth of vector Aedes aegypti. Sharma et al found altered mentation in 5.7% patients and cause could be Metabolic, DIC, hepatic encephalopathy or gross oedema of brain which is very similar to present study.[8] The symptomatology of the present study was in accordance with Chhina et al.[11] The most common haemorrhagic manifestation as petchiae in present study were similar to Shah et al.[10] Ratgeri et al reported that gastrointestinal bleeding was commonest bleeding manifestations.[12]

In present study hepatomegaly was seen in 15% and splenomegaly in 25%patients.Narayanan et al and Singh et al showed hepatomegaly in 52.5% and 10.8% of total patients.[13,14] Splenomegaly was 16.8% by Krishnamurthy et al.[15] Ascites as commonest clinical finding in the present study was 38.33% as comparable to 20% in SrivenuIthaetal.[16] We observed pleural effusion in 3 (5%) patients which belonged to all DHF group, but 1.08% in Singh et al and 10.2% in Narayanan et al.[13,14] Icterus was seen in 7 (11.67%) patients in present study. In Singh et al and SrivenuItha et al, icterus was 4.3% and 16% of patient's respectively.[14,16]

In present study, platelet count was inadequate (<1 lack) in 36 (60%) patients; out of which 24 (66.67%) patients belong to DHF/DSS group in which bleeding tendency may be due to factors other than thrombocytopenia like vasculopathy, coagulopathy or platelet dysfunction as supported by studies by B.K. Tripathi et al and Narayanan et al.[13,17] In our study liver enzymes were higher in DHF patients with spontaneous bleeding. Wahid SF et al was observed similar findings that hepatomegaly and elevated liver enzymes were more common in DHF as compared to DF.18 Lymphadenopathy was seen in 3.33% of patients as uncommon manifestation in the present study but lesser by Narayanan et al (10.2%).[13]

The ultrasound findings in early milder form of DF include GB wall thickening, pericholecystic fluid, minimal ascites, pleural effusion, pericardial effusion and hepatosplenomegaly. Severe forms of the disease are characterized by fluid collection in the perirenal and pararenal region, hepatic and splenic subscapular fluid and pancreatic enlargement. These findings were similar to study by Pramuljo HS et al and Joshi et al.[19,20]

The altered mentation was the unusual neurological

manifestation in 22 (36.67%) patients commonly associated with poor prognosis patients. altered sensorium was reported 8% by Narayanan et al 23.7% patients.[13] The two patient developed ARDS in present study. Among them one was expired and other recovered. Sharma et al found ARDS in one case out of 98 patients. Gurdeep Dhooria et al observed 2.4% ARDS in patients.[21] The possible cause might be due to diffuse pulmonary involvement by virus, aspiration of gastric contents or gram negative sepsis. The mortality rate was 8.75% in our study which is more than Agarwal et al (6%).[22] The cause of death might be lower haemoglobin because of bleeding tendency, shock, sepsis and respiratory failure in present study.

Conclusion

Dengue fever infection was found more in younger age groups. The factors significantly associated with poor prognosis group (DHF/DSS) were anorexia, altered mentation, conjunctival injections, anaemia with Hb < 10 mg%, haemoconcentration with haematocrit > 40, thrombocytopenia and deranged liver enzymes SGOT. Dengue infection resulted in various complications like neurological, cardiac, haematological, liver and renal. Haematological complication like bone marrow suppression and bleeding caused death due to dengue infection.

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