Study of clinical and laboratory features with outcome in patients of dengue viral infection

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Abstract

Introduction: Dengue is one of the most important arboviral infections of humans. World-wide incidence of Dengue fever (DF) and Dengue hemorrhagic fever (DHF) has increased dramatically in recent decades. **Aims and Objectives:** To study Clinical and Laboratory Features with Outcome in Patients of Dengue Viral Infection. **Methodology:** This prospective observational study was carried out after clearance from local ethical committee from November 2013 to November 2015 in tertiary care hospital. All eligible patients of either sex according to inclusion/exclusion criteria who were admitted in the hospital due to acute febrile illness were evaluated for clinical and biochemical features of DF, DHF and DSS. The WHO classification and case definitions were used to classify the disease as DF, DHF and DSS. Statistical Package for Social Sciences (SPSS) version 14.0. Means and standard deviations were calculated for continuous variables and frequencies for categorical variables. Cross tabulation was done to determine relationship between different variables and P-values were calculated as the test of significance. The clinical manifestations and laboratory findings of each group of illness were compared using the Fisher's exact test for proportions. **Result:** Among 178 cases of Dengue viral infection, there were 96 (53.93%) male patients and 82(46.07%) female patients. The ratio of male to female was 1.17. Maximum number of males and females were both from the age group of 11-20 years. The Cases were more common in Males as Compared to Females (53.93%) and (46.07%) respectively. In this study the most common features amongst the non-survivor dengue fever infection patients were fever (100%), headache (87.5%), restlessness (87.5%), pallor (75%) and facial puffiness (62.5%). Restlessness, headache, pallor and facial and Laboratory Parameters like Deranged KFT (25%) and Deranged LFT (50%) puffiness were statistically significant. **Conclusion:** It could be concluded from our study that: The prevalence of disease was more in younger population with more gender predisposition towards males. Most common features amongst the non-survivor cases were fever, pallor, restlessness, vomiting, facial puffiness and Deranged KFT and LFT.
Key Words: Dengue fever (DF), Dengue hemorrhagic fever (DHF), Deranged KFT, Deranged LFT.

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INTRODUCTION

Dengue is one of the most important arboviral infections of humans. World-wide incidence of Dengue fever (DF) and Dengue hemorrhagic fever (DHF) has increased dramatically in recent decades.[1]The first clinical report about dengue was by Dr. Benjamin Rush (Philadelphia) who described it as "Break bone fever" because of symptoms like myalgia and arthralgia.[2]It is the fast spreading mosquito-borne viral disease in the world. In the last 50 years, incidence has increased 30-fold with increasing geographic expansion to new countries and, recently from urban to rural settings.[3] In India dengue is prevalent since last two centuries. Every year there has been upsurge in occurrence. In last decade, major outbreaks and death have occurred in Northern India (Haryana, Punjab and Uttar Pradesh), Southern India (Andhra Pradesh, Tamil Nadu and Karnataka), Western India (Gujarat, Rajasthan) and Eastern India (West Bengal). The case fatality has increased to above 1%are last 10 years.[4]Symptomatic dengue virus infections were

grouped into three categories: undifferentiated fever, dengue fever (DF) and dengue hemorrhagic fever (DHF). DHF was further classified into four severity grades, with grades III and IV being defined as dengue shock syndrome (DSS).[1,5,6,7] Difficulties in applying the criteria for DHF in the clinical situation, together with the increase in clinically severe dengue cases which did not fulfill the strict criteria of DHF, led to the request for the classification to be reconsidered. Symptomatic dengue virus infections were grouped into three categories: undifferentiated fever, dengue fever (DF) and dengue hemorrhagic fever (DHF). DHF was further classified into four severity grades, with grades III and IV being defined as dengue shock syndrome (DSS).[1,5,6,7] Difficulties in applying the criteria for DHF in the clinical situation, together with the increase in clinically severe dengue cases which did not fulfill the strict criteria of DHF, led to the request for the classification to be reconsidered. Clinical specimens retrieved from them may allow the isolation of an agent, sub typing or strain identification, antimicrobial sensitivity testing, molecular analysis, and other characterization that is increasingly available through clinical and research labs (Houpikian and Raoult 2002).[8] Clinical specimens retrieved from them may allow the isolation of an agent, sub typing or strain identification, antimicrobial sensitivity testing, molecular analysis, and other characterization that is increasingly available through clinical and research labs (Houpikian and Raoult 2002).[8] its origin and route of spread. The laboratory forms an essential part of the analysis.[9]

METHODOLOGY

This prospective observational study was carried out after clearance from local ethical committee from November 2013 to November 2015 in tertiary care hospital.

All eligible patients of either sex according to inclusion/exclusion criteria who were admitted in the hospital due to acute febrile illness were evaluated for clinical and biochemical features of DF, DHF and DSS. The WHO classification and case definitions were used to classify the disease as DF, DHF and DSS. Patients with acute febrile illness and clinical features suggestive of dengue with positive serology of dengue were labeled as Dengue Confirmed while patients with clinical features suggestive of dengue but negative for dengue serology, malarial parasites and negative blood cultures were excluded from the study. Informed writ-ten consent was obtained from all stable patients and from the closest relative of patients who were critically ill. Clinical hematological and biochemical findings were recorded serially until discharge. Enteric fever was ruled out by performing Widal test in indicated. Malaria was excluded

by peripheral thick and thin film examination which was done in all patients. Complete blood count was repeated daily where indicated to monitor the condition of patient. Additional tests like IgM antibodies for leptospirosis (Panbio, Brisbane, Australia), blood culture, urine culture, d-dimer, partial thromboplastin time, endoscopy, ultrasonography abdomen and pelvis, X Ray chest *etc.*, All the patients were monitored for their clinical, biochemical and hematological profile and the data was recorded and treated according to WHO guidelines.

All variables were entered into Statistical Package for Social Sciences (SPSS) version 14.0. Means and standard deviations were calculated for continuous variables and frequencies for categorical variables. Cross tabulation was done to determine relationship between different variables and P-values were calculated as the test of significance. The clinical manifestations and laboratory findings of each group of illness were compared using the Fisher's exact test for proportions

RESULT

Table 1: Distribution of Cases of Dengue Viral Infection according to Age and Sex

Age Groups	Males		Females	
	No of Cases	Percentage (%)	No of Cases	Percentage (%)
11-20	39	21.91	41	23.00
21-30	28	15.73	19	10.67
31-40	8	4.49	8	4.49
41-50	12	6.74	9	5.06
51-60	2	1.12	1	0.56
61-70	6	3.37	4	2.25
71-80	1	0.56	0	0.00
Total	96	53.93	82	46.07

Among 178 cases of Dengue viral infection, there were 96 (53.93%) male patients and 82(46.07%) female patients. The ratio of male to female was 1.17. Maximum number of males and females were both from the age group of 11-20 years.TheCases were more common in Males as Compared to Females (53.93%) and (46.07%) Respectively.

Table 2: Association of Clinical and Laboratory Features with Outcome in Patients of Dengue Viral Infection

Clinical Feature	Survivor n=170 (%)	Non-Survivors n=8 (%)	P-Value
Fever	170(100%)	8(100%)	1
Bodyache	101(59.41%)	3(37.5%)	0.279
Arthralgia	15(8.82%)	2(25%)	0.178
Restlessness	6(3.52%)	7(87.5%)	0
Abdominal Pain	21(12.35%)	1(12.5%)	1
Vomiting	68(40%)	2(25%)	0.483
Headache	70(41.17%)	7(87.5%)	0.022
Retroorbital Pain	32(18.82%)	2(25%)	0.649
Rash	70(41.17%)	5(62.5%)	0.2841

Hepatomegaly	38(22.35%)	4(50%)	0.096
Splenomegaly	4(2.35%)	0(0.00%)	1
Icterus	3(1.76%)	2(25%)	1.01
Pallor	12(7.05%)	6(75%)	<0.001
LNpathy	5(2.94%)	0(0.00%)	1
Conjunctival Congestion	35(20.58%)	1(12.5%)	1
Facial Puffiness	15(8.82%)	5(62.5%)	0.0009
Deranged KFT	2(1.17%)	2(25%)	0.002
Deranged LFT	22(12.94%)	4(50%)	0.016
Thrombocytopenia	49(28.82%)	2(25%)	1
Leucopenia	143(84.11%))	8(100%)	0.609
Increased hematocrit	1(0588%)	5(62.5%)	0

In this study the most common features amongst the non-survivor dengue fever infection patients were fever (100%), headache (87.5%), restlessness (87.5%), pallor (75%) and facial puffiness (62.5%). Restlessness, headache, pallor and facial and Laboratory Parameters like Deranged KFT (25%) and Deranged LFT (50%) puffiness were statistically significant.

Discussion:
There are few studies which shows equal prevalence of dengue in both gender as Nandini Chatterjee, Mainak Mukhopadhyay et al[10], 2014,found that in total 180 patients of 92(51.1%) were male and 88(48.9%) were female with male to female ratio of 1.045:1 which is similar to male:female ratio of 1:1 noted by M. Emmanuel Bhaskar, Swathimoorthy et al[11](2010) in their study of "Dengue hemorrhagic fever amongst adults- an observational study in Chennai, south India", where total 128 patients with DHF were studied.

Association of Clinical Features With Outcome In Patients Of Dengue Viral Infection –
Various factors were found to be associated with outcome in dengue viral infection. In this study, the most common features amongst the non-survivor dengue fever infection patients were fever (100%), headache (87.5%), rest-lessness (87.5%), pallor (75%) and facial puffiness (62.5%). Restlessness, headache, pallor and facial puffiness were statistically significant. In this study, amongst the non-survivor cases of dengue shock syndrome most common features were fever (100%), pallor (100%), restlessness (85.71%), vomiting (85.71%), facial puffiness (85.71%). Statistically significant were restlessness, pallor and facial puffiness. In this study, only one patient of dengue hemorrhagic fever died. He had fever, restlessness, vomiting, headache and conjunctival congestion.
Joel Navarrete et al [12] concluded that low platelet count, hematemesis & malena were main events associated with mortality. Other factors like male sex, older age, vomiting, pain abdomen, hepatomegaly, ascites, and pleural effusion were associated with severe form of disease & mortality. Aysha Almas, Om Parkash et al[13] in their study "Clinical factors associated with mortality in dengue infection at a tertiary care center" six hundred ninety-nine patients with a clinical diagnosis of dengue fever (DF), dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) during the study period were included. Outcomes (survival/mortality) and complications were recorded. Mortality was the primary outcome measure. DF constituted 86.4% (604), DHF constituted 11.6% (81) and DSS constituted 2% (14) of patients. The mortality rate was 2.7% (19).
Frederico Figueiredo Amâncio Tiago Pires Heringer et al[14] (2015) in their study "Clinical Profiles and Factors Associated with Death in Adults with Dengue" Admitted to Intensive Care Units, Minas Gerais, total of 97 patients were studied. Non survivors were older, exhibited lower serum albumin concentrations and higher total leukocyte counts and serum creatinine levels. Other risk factors (vomiting, lethargy/restlessness, dyspnea/respiratory distress) were also associated with death in a univariate analysis. An increased frequency of ICU admission due to severe organ dysfunction, higher severity indices and scarcity of ICU beds may partially explain the higher mortality.
Conclusion:It could be concluded from our study that: The prevalence of disease was more in younger population with more gender predisposition towards males.Most common features amongst the non-survivor cases were fever, pallor, restlessness, vomiting, facial puffiness and Deranged KFT and LFT.

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