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Research Article

**RELATED CLINICAL CARDIAC MANIFESTATIONS OF  
DENGUE INFECTION AND TO FIND OUT ANY CHANGE IN  
ELECTROCARDIOGRAPHIC (ECG) OF PATIENTS  
AFFECTED BY DENGUE VIROUS: CROSS SECTIONAL  
STUDY****Dr. Ayesha Latif, Dr. Yumna Khan, Dr. Maham Ayub**  
Mayo Hospital, Lahore**Abstract:**

**Objective:** The aim of the study was to conclude the occurrence of ECG alterations in patients with dengue hemorrhagic infection and dengue fever.

**Study Design:** Cross sectional analytical study.

**Place and Duration of Study:** Completed the study in the time of 03 months started from January, 2018 and ended in March, 2018 in department of Medicine, Services Hospital, Lahore.

**Patients and Methods:** Selected a total number of 116 patients infected by dengue virus for the study. Carried out their medical examination and noted the clinical presentation. Noted the reference values of every patient and after that on regular bases monitored the fluid status, blood counts and metabolic profile. Calculated the results of Electrocardiogram (ECG) of all patients. Carried out radiological examination in form of chest radiograph and ultrasound abdomen of those patients who were edict of Dengue Hemorrhagic fever.

**Results:** Divided all 116 patients according to type of fever as 47.4% (55) patients fall in Dengue Hemorrhagic Fever and 52.6% (61) were patients of Dengue Fever. Found normal results of ECG in 78 patients. Noted the abnormal ECG results like left bundle branch block, ST depression, poor progression of R wave tachycardia, bradycardia and supraventricular tachycardia. ECG findings showed no noteworthy relationship with dengue infection.

**Conclusion:** With or without cardiac indications dengue infection can vary the results of ECG. Bradycardia and ST depression were the commonly noticed findings.

**Key Words:** Electrocardiogram (ECG), Dengue Hemorrhagic fever, Dengue fever

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**INTRODUCTION:**

Approximately 50 % people of the whole world are at danger of viral infection known as dengue as this deadly virus spread naturally in tropical and subtropical climates. there are 50 million 100 million dengue victims yearly according to 2017 fact sheet by WHO. Hospitalize dengue patients are about 5 million and nearly two and half percent expires every year [5]. Epidemicity of Dengue virus widely spread in Pakistan in 2012. Affected people by this virus were in thousands all over the country.

Aedes mosquito in the carrier of this deadly virus and it has four serotypes. The main symptom which appears in the victims of dengue virus is Dengue Fever (DF), Dengue Shock Syndrome (DSS) and most dangerous shape as dengue hemorrhagic fever (DHF). Fever and flu like signs are the primary indication of this disease which routes the development of thrombocytopenia and leucopenia in patients. Further which may result in bleeding from different parts of body. Recovery procedure includes fluid arrangement and firm observation of the victims. Multi organ failure and shock like symptoms appear in severely affected patients. Recognition way of Dengue infection is through radiological and biochemical tests like decreased serum cholesterol [7], ascites [8], pleural effusion deranged liver enzymes [6] and decreased serum albumin.

According to the findings of various studies about dengue, observation clarify affects of this disease on various systems. Discovered same cases according to the findings of a research study in Srilanka [9]. Dengue fever is relatively new to our country. There is a need of exploration of different aspects of this deadly infection such as myocarditis, Cardiovascular, mostly asymptomatic or with arrhythmias, cardiovascular involvement and electrophysiological changes.

Purpose of this research study is to observe whether there are any related clinical cardiac manifestations of dengue infection and to find out any change in Electrocardiographic (ECG) of patients affected by dengue virus.

**PATIENTS AND METHODS:**

Carried out present cross-sectional research study in the time duration of 03 months from January, 2018 to March, 2018 in Medicine department of Services Hospital, Lahore. A selection criterion for the study was according to WHO specified standers and in accordance to this criterion, carefully chosen 116 patients of Dengue fever and Dengue Hemorrhagic fever.

According to the selection criteria of dengue fever included those patients in current research study who were suffering from high grade fever for three to five days along with thrombocytopenia (platelet count < 100,000/cmm) and leucopenia (white blood cell count < 4000/cmm) with or without bleeding from any part of body. Those patients who complained about stomach or belly pain with pleural expression or ascites which indicated the critical phase, classified as the victims of Dengue hemorrhagic fever (DHF). Recorded the demographic profile like gender and age. Noted the Incidence of indications like abdominal pain, fever and bleeding. Also noted the existence or absenteeism of cautionary symptoms like decreased capillary refilling test, low blood pressure, narrow pulse pressure and took the confirmation through investigating for Dengue IgM. Identified the cardiac signs like palpitations, chest pain and dyspnea.

Carried out ultrasound abdomen and Chest radiograph in suspected DHF patients. Performed the hematological examinations of all patients which include complete blood count including hematocrit, liver and renal function tests. Observed proper follow-up throughout the admission period of the patients by intake output monitoring, evidence of fluid leak in form of pleural effusion or ascites, daily vitals monitoring and pulse pressure measurement.

Main conclusion measure of this study was decrease or discharge of sufferers in steady state. Subordinate consequence variables were indications like arrhythmias, dyspnea, chest pain and indication of cardiac failure noted on ECG or clinically. Within 24 hours of admission checked ECG and cardiac enzymes of all patients. Followed the instructions of WHO regarding monitoring and management of fluid. Frequently observed important biochemical tests like serum electrolytes, liver functions, clotting profile, complete blood count and renal profile.

Completed Cross tabulation between DF and DHF with different ECG findings. Applied Chi square to test the consequence of DHF by various ECG results. Described numerical data as mean  $\pm$  standard deviation (SD). Expressed categorical statistics like clinical features and gender as frequencies. Performed statistical analysis on SPSS software version 20.

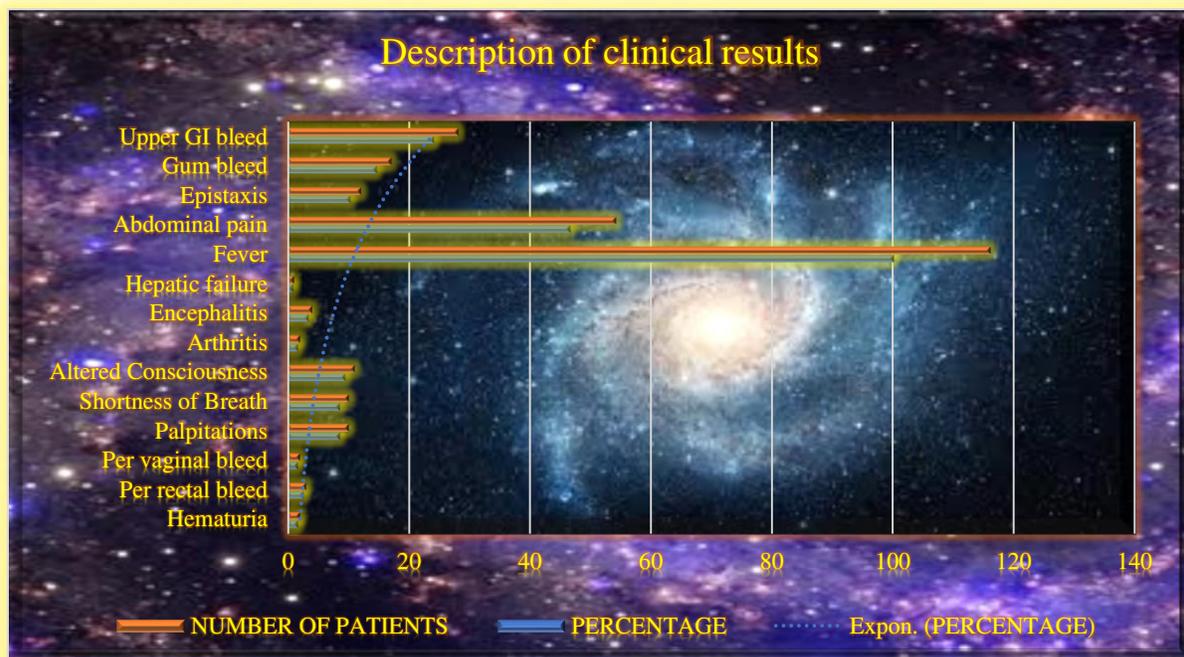
**RESULTS:**

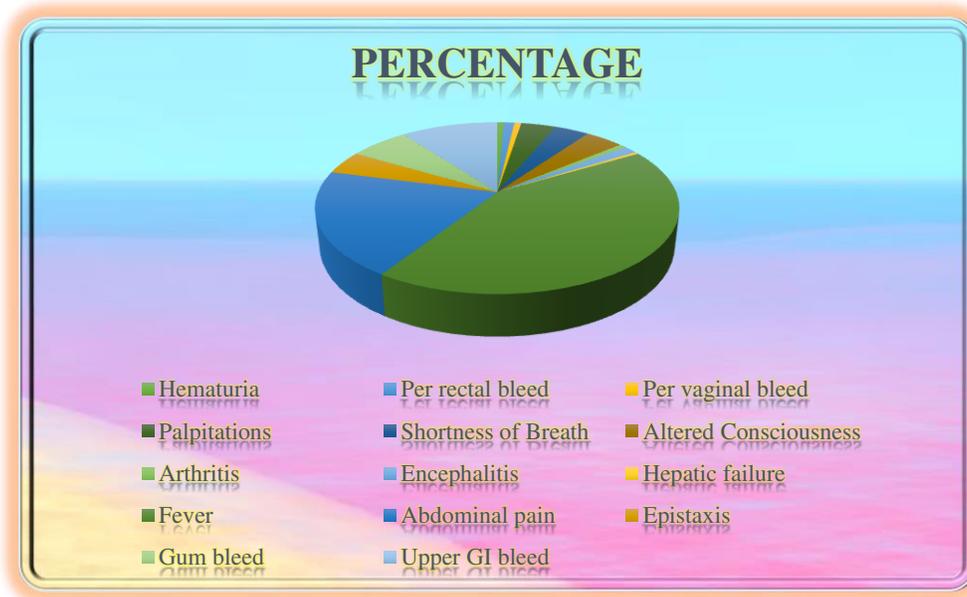
Made the selection of 116 persons who were victims of dengue fever for the present research study. Gender distribution was as 19% (22) were feminine and 81% (94) were masculine with the average age of

32.89 ± 14.5 years. Description of clinical results given below in Table No 1.

**Table No 1: Description of Clinical Results**

CLINICAL FEATURES	PERCENTAGE	NUMBER OF PATIENTS
Hematuria	1.7	2
Per rectal bleed	2.6	3
Per vaginal bleed	1.7	2
Palpitations	8.6	10
Shortness of Breath	8.6	10
Altered Consciousness	9.5	11
Arthritis	1.7	2
Encephalitis	3.4	4
Hepatic failure	0.9	1
Fever	100	116
Abdominal pain	46.6	54
Epistaxis	10.3	12
Gum bleed	14.7	17
Upper GI bleed	24.1	28





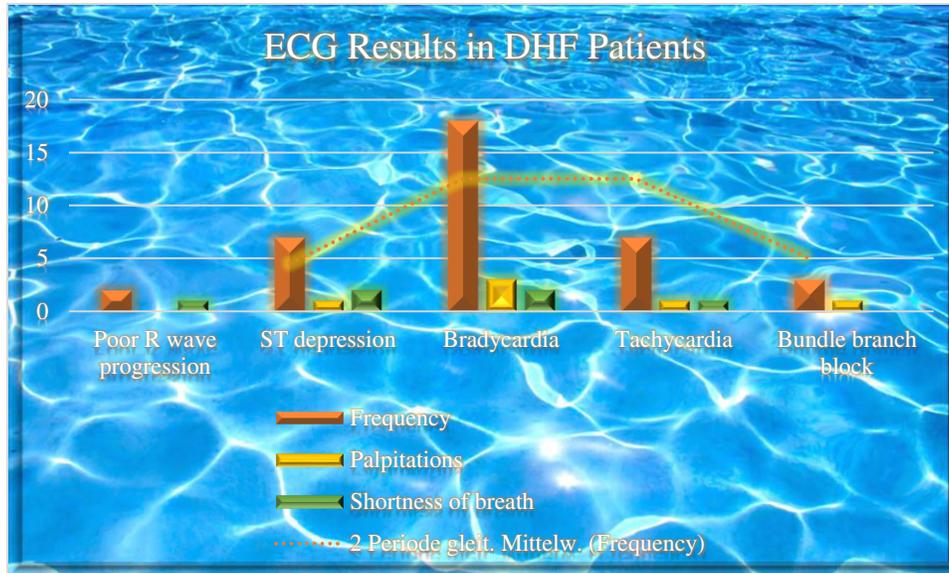
Addicted quantity of dengue hemorrhagic fever (DHF) was in 47.4% (55) and 52.6% (61) identified as dengue fever. Performed the ECG of all sufferers and found normal results in majority of patients. Analyzed the ECG results of Dengue Hemorrhagic fever patients and Dengue fever patients. After the ECG results analyses of dengue hemorrhagic fever (DHF) sufferers found 38 patients with normal results amongst 55 of total victims. Noticed ST depression in 4 patients, poor progression of R wave in 1 patient, tachycardia in 5 patients, left bundle branch block in 2 and Bradycardia in 5 patients. Though, found bradycardia to be associated with p value of 0.069, any of the ECG outcome was not meaningfully interrelated to DHF.

Also, after the analyses of ECG results found 39 patients with normal results amongst 61 of total dengue fever addicted patients, rest of 2 sufferers had tachycardia which continued even when they were hemodynamically stable and afebrile and 13 patients had bradycardia. Saw ST depression in 3 victims. One patient showed poor progression of R wave, one with new onset left bundle, one had branch block and one with supraventricular tachycardia.

Found ascites of ultrasound in 24.09% (28) patients of dengue hemorrhagic fever (DHF). Pleural effusion noticed in 13.8% (16) patients, 6.9% (8) had splenomegaly, 20.7% (29) had gall bladder edema and 7.8% (9) patients had hepatomegaly. Likewise observed the affiliation of cardiac indications like shortness of breath and palpitations with diverse ECG results in DHF patients. Table No 2 below also show these observations.

**Table No 2: ECG Results in DHF Patients**

ECG changes	No of Patients	Palpitations	Shortness of breath
Supraventricular tachycardia	1	None	None
Poor R wave progression	2	None	1
ST depression	7	1	2
Bradycardia	18	3	2
Tachycardia	7	1	1
Bundle branch block	3	1	None



Observations show that existence of dyspnea have no affiliation beside existence or absenteeism of pleural effusion with P value as 0.55. Found no patient complaining about any cardiac complication like cardiac failure, angina, myocardial infarction or symptom of chest pain at presentation and neither developed chest pain at any other time. Concerning the main prime result, no death was occurred and discharged all patients from hospital.

**DISCUSSION:**

Epidemicity of Dengue infection had broadly blowout in Pakistan and in a few last years affected persons by this viral disease are in thousands all around the territory. Noticed attachment of various organs, with passage of time. Recorded Cardiac engrossment in the shape of myocarditis. Masilza et al in his study found atrial fibrillation in a sufferer with physically normal heart [11]. In a study by Satara singhe et al, the cause of severe illness or

mortality in a dengue infection might be myocarditis as the main conclusion of his study was T wave inversion [10]. Present study exposed that T wave inversion is not the only indication. Documented atrial fibrillation in conjunction with diffuse ST segment elevation and low voltage QRS in a death case of myocarditis [12]. The members of this study had other arrhythmias like bundle branch block but didn't noticed any atrial fibrillation in them. Noticed ECG indexes for example bradycardia,

tachycardia, T wave inversion and bundle branch block, in a study in Srilanka in 2005 during Dengue incidence [4]. Found same alike results in patients of present study. 5 out of 17 (29%) sufferers of dengue hemorrhagic fever (DHF) had ECG variations in an Indian study by Wali et al [3]. According to the results of this research study 13 (7.15%) out of 55 patients of dengue hemorrhagic fever (DHF) were having abnormal ECG state.

Gulati reread the Literature and exposed to carry out the documentation of rhythm turbulences for example ectopic ventricular beats, atrioventricular blocks, atrial fibrillation and sinus node dysfunction in dengue hemorrhagic fever (DHF) [2]. According to the findings of present research study there were only two patients of dengue hemorrhagic fever (DHF) with left bundle branch block and didn't found any other abnormality of rhythm turbulences. Another study by Gupta and Gadpayle, in which no patient had any cardiac indications though they had ECG variations alike tachycardia and bradycardia, patients of current study had cardiac signs such as palpitations and dyspnea [1].

### CONCLUSION:

According to the findings of current research study with or without cardiac indications dengue infection can vary the results of ECG. The frequently observed conclusions are bradycardia and ST depression. Found ECG variations in both indicative and non-indicative patients.

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