

ORIGINAL ARTICLE

Incidence of Arrhythmias in Patients with Dengue Hemorrhagic Fever Presenting in Tertiary Care HospitalRASHID IQBAL¹, KHAWAR SHOAB², SAIRA KHALID³¹Associate Professor of Medicine, Department of Medicine Fatima Jinnah Medical University/Sir Ganga Ram Hospital, Lahore^{2,3}PGR Medicine, Department of Medicine Fatima Jinnah Medical University/Sir Ganga Ram Hospital, Lahore

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ABSTRACT**Objectives:** To determine the incidence of arrhythmias in patients with Dengue Hemorrhagic fever presenting in Tertiary care Hospital.**Study Design:** Retrospective Observational Study.**Settings:** This study was done in Department of Medicine, Sir Ganga Ram hospital Lahore.**Timings:** From 1-10-2022 to 31-12-2022.**Methods:** This paper describes the number of arrhythmia cases in Dengue hemorrhagic fever patients. We separated Dengue hemorrhagic fever patients from dengue fever patients and then divide Dengue hemorrhagic fever patients in two groups: Critical phase group and Recovery phase group. We picked up and analyzed the critical phase group to see the incidence of arrhythmias. We did so by interpreting files and charts of the patients admitted to Medicine department of Sir Ganga Ram Hospital, Lahore. We confirmed dengue hemorrhagic fever by checking the capillary leak phase of the patients by looking at ultrasound of abdomen for any signs of leakage, chest X-ray PA view, hematocrit and capillary refill time of the patients and then we tabulated the data.**Results:** A total number of 64 patients were selected during dengue epidemics from October 2022 to December 2022. Among 64 patients, Dengue fever patients were 23 (35.9 %) and dengue Hemorrhagic fever patients were 41 (64.1 %). Dengue Hemorrhagic fever patients were with in capillary leak phase. In Dengue Hemorrhagic fever patients, 14 patients (34.14 %) were having tachycardia in critical phase and 5 patients (12 %) were having bradycardia in critical phase. The present study was done with the aim to determine the clinical profile of dengue patients and to study the cardiac manifestations in patients with Dengue fever. Arrhythmias had been reported in literature but these were reported in recovery phase of dengue hemorrhagic fever^{7,15}. In dengue epidemic patients seen in our set up, bradycardia was seen in critical phase of dengue hemorrhagic fever³. Previously bradycardia was reported in recovery phase of dengue hemorrhagic fever^{2,16}. In critical phase of dengue hemorrhagic fever there is chance of hypotension as fluid shifts to third space due to capillary leak. So bradycardia need to monitor carefully in critical phase. Very care full attention to fluid balance and hemodynamic monitoring is required in critical phase of Dengue hemorrhagic fever. This research will be helpful for careful monitoring of arrhythmias in critical phase of dengue hemorrhagic fever patients and results in decrease morbidity in dengue hemorrhagic patients in our community.**Conclusion:** Dengue virus induced arrhythmias were under reported but it is an important complication in Dengue Hemorrhagic patients. Bradycardia is one of cardiac complication can be present in critical phase of Dengue Hemorrhagic fever patients. Strict monitoring of patients with bradycardia is required in critical phase of Dengue Hemorrhagic patients.**Keywords:** Dengue Hemorrhagic Fever, Arrhythmias, Critical Phase.**INTRODUCTION**

Dengue fever is the most common arbovirus illness which is transmitted by A. EGYPTI and A. ALBOPICTUS. It is an infectious disease which is caused by RNA virus which has further four subtypes DEN1, DEN2, DEN3, DEN4. The time between exposure to virus and onset of clinical symptoms ranges from 3-14 days. Symptoms starts with fever, headache, retro-orbital pain, rash, severe myalgia and arthralgia's. Dengue Hemorrhagic fever and Dengue shock syndrome are the serious clinical manifestations characterized by increased vascular permeability, thrombocytopenia, bleeding tendencies and hypovolemic shock^{11,12}.

Dengue fever is emerging as infectious disease in our community¹. Dengue fever is also known as break bone fever. It has three clinical Phases (Febrile Phase, Critical Phase and Recovery Phase). During febrile phase there is high grade fever, severe bone pains and headache and rash. The critical phase of the Dengue infection is associated with a falling platelet count and rising hematocrit level greater than twenty percent. Critical phase last only for twenty four to forty eight hours. In critical phase there is capillary leak which is characterized by fluid leakage in third space and hypotension. Capillary leakage that can be confirm by pleural effusion on chest X-ray, ascites and fluid collection around gall bladder on ultrasound of abdomen. In recovery phase, there is chance of fluid volume overload. As the fluid went to third space during critical phase, it shifts back during recovery phase. So, strict fluid monitoring is done during critical phase of Dengue hemorrhagic fever to avoid fluid volume overload in recovery phase. Dengue fever is differentiated from Dengue Hemorrhagic fever by capillary leak signs. Dengue fever is confirmed by tests like NS1 antigen, Dengue Serology (IgM and IgG) and PCR test¹⁷.

Patients had been presenting to our tertiary care hospital with thrombocytopenias, bleeding tendencies, abnormal Liver functions and cardiac complications like arrhythmias. The purpose of study is to analyze the clinical feature and Electrocardiographic changes in patients presented to our Tertiary care Hospital. In the view of increasing incidence of Dengue Hemorrhagic fever, the study of both the sub clinical and clinical cardiac manifestations in dengue via clinical examination, cardiac biomarkers, ECG and Echocardiography was done¹³.

MATERIAL AND METHODS

This paper describes the number of arrhythmia cases in Dengue hemorrhagic fever patients. We separated Dengue hemorrhagic fever patients from dengue fever patients and then divide Dengue hemorrhagic fever patients in two groups: Critical phase group and Recovery phase group. We picked up and analyzed the critical phase group to see the incidence of arrhythmias. We did so by interpreting files and charts of the patients admitted to Medicine department of Sir Ganga Ram Hospital, Lahore.

Inclusion Criteria: Patients who fulfill the following criteria were included in the study:

- High grade fever between 2 to 10 days
- Thrombocytopenia and Leukopenia
- Capillary leak signs present

Exclusion criteria:

- Patients with symptoms of other causes of fever
- Patients with normal platelet count
- Patients with fever greater than 10 days

We confirmed dengue hemorrhagic fever by checking the capillary leak phase of the patients by looking at ultrasound of abdomen for any signs of leakage, chest X-ray PA view, hematocrit and capillary refill time of the patients and then we tabulated the data. Dengue hemorrhagic fever patients were having Low platelet count, raised hematocrit level, pleural effusion on Chest X-ray, ascites and fluid collections around gall bladder on abdominal ultrasound. ECG changes were interpreted to detect arrhythmias in critical phase of Dengue Hemorrhagic fever patients. Echocardiography was also done in patients with abnormal electrocardiographic changes.

RESULTS

A total number of 64 patients were selected during dengue epidemics from October 2022 to December 2022. All these patients were admitted in department of medicine. Among 64 patients, Dengue fever patients were 23 (35.9 %) and dengue Hemorrhagic fever patients were 41 (64.1%).

Table 1: Age and Gender distribution of cases with Dengue fever n=64,

Male			Female		Total
Age (years)	Dengue Confirmed	Dengue probable	Dengue Confirmed	Dengue probable	
12-45	15	4	14	5	38
46-60	7	2	7	2	18
>60	5	1	2	0	8
Total	27	7	23	7	64

From total 64 patients, 34 (53.12%) patients were male patients and 30 (46.87%) patients were female patients. Dengue Hemorrhagic fever patients were with in capillary leak phase.

Table 2: Clinical features in Dengue fever cases n=64,

Clinical features	Dengue hemorrhagic fever patients
Fever	100 %
Bleeding	8%
Tachycardia	34.14%
Bradycardia	12%
Diarrhea	14%
Abdominal pain	20%
Cough	3%

Table 3: Laboratory findings of Dengue Fever n=64.

Laboratory findings	Dengue patients n = 64(100%)
Platelet count <100,000	n= 49 (76%)
HCT >20%	n=23 (35.93%)
WBC <4000	n= 48 (75%)

In Dengue Hemorrhagic fever patients, 14 patients (34.14%) were having tachycardia in critical phase and 5 patients (12 %) were having bradycardia in critical phase.

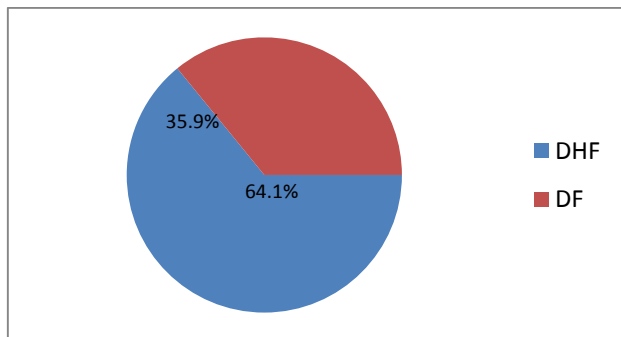


Figure A: Number of Patients of Dengue Fever and Dengue Hemorrhagic Fever

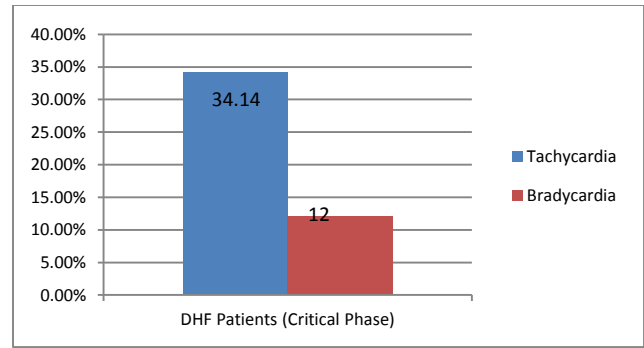


Figure B: Incidence of Arrhythmia in critical phase of Dengue Hemorrhagic Fever

DISCUSSION

Dengue fever is an important emerging disease of the tropical and subtropical regions today. Research on dengue has grown exponentially, generating several specialized reviews¹⁸. Dengue fever is confused with the number of bacterial, viral, rickettsia diseases and parasitic infections, the identifications of dengue cases is possible by distinct clinical features even though patient do present with varied manifestations. Definite diagnosis of dengue fever is done by virus isolation and serology. Dengue fever is confirmed by tests like NS1 antigen, Dengue Serology (IgM and IgG) and PCR test¹⁷.

The clinical profile in this study reveals that fever was found in all patients. Similar studies in Pakistan also substantiated fever as the most common presenting symptoms though ashwani et al, in previous studies found 83.9 % patients presented with fever¹⁸. Our study also showed cardiac involvement like arrhythmias in Dengue Hemorrhagic fever patients. Dengue Fever has become a big health problem in our community. Hospitals in our country are seeing large number of cases every year. Patients of dengue hemorrhagic fever are presenting with different complications like bleeding, shock and cardiac changes⁵. Thrombocytopenia's have been observed in 76% patients presented in our study. Cough have also been observed in 3% patients presented in our tertiary care hospital.

Cardiac involvement in Dengue Hemorrhagic fever has been seen in centers handling large number of cases. Cardiac manifestations in dengue virus infection can range from asymptomatic bradycardia to life threatening myocarditis^{2,3}. Various studies have quoted several cardiac manifestations of dengue infection like sinus bradycardia, transient AV blocks, transient ventricular arrhythmias, myocarditis, systolic and diastolic dysfunctions and pericardial effusion³.

The pathophysiology of cardiac involvement is not clear. But direct viral invasion of myocardium and cytokine mediated invasion of myocardium and cytokine mediated immunological injury has been postulated¹. Myocarditis, arrhythmias, pericarditis and cardiomyopathy after dengue have been reported in literature but no large reports on adult patients have been seen from Pakistan^{6,9}. Arrhythmias had been reported in literature but these were reported in recovery phase of dengue hemorrhagic fever^{7,15}.

In dengue epidemic patients seen in our set up, bradycardia was seen in critical phase of dengue hemorrhagic fever³. Previously bradycardia was reported in recovery phase of dengue hemorrhagic fever^{2,16}. In the present study , 53.86% patients have normal ECG and 46.14 % patients have abnormal ECG. Among them, 14 patients (34.14%) were having tachycardia in critical phase and 5 patients (12 %) were having bradycardia in critical phase dengue hemorrhagic fever. In the study of Kularatne, 62.5 % of patients had abnormal ECG findings. In the study of Sheethal et al., the commonest rhythm abnormality noted was sinus bradycardia found in 32% patients. Three patients had unexplained tachycardia. In the study by Gupta et al., sinus bradycardia was found in 14.28% and sinus tachycardia was found in 21.4 %¹³.

The presence of ECG changes has been used to detect arrhythmias and cardiac involvement. In our study 34.14 % patients were having tachycardia in critical phase and 12 % patients were having bradycardia in critical phase. The arrhythmias were tend to be self-limiting and benign and ECG changes were the only cardiac involvement in these patients. The underlying mechanism of these ECG changes have been explored. Possibilities include alter autonomic tone, electrolytes and calcium changes or sub clinical myocarditis⁵. Myocarditis can be reason of some of arrhythmias in dengue Hemorrhagic patients¹⁰.

In critical phase of dengue hemorrhagic fever there is chance of hypotension as fluid shifts to third space due to capillary leak. So bradycardia need to monitor carefully in critical phase. Very care full attention to fluid balance and hemodynamic monitoring is required in critical phase of Dengue hemorrhagic fever. Hence transient Cardiac arrhythmias can be an important presentation among patients with Dengue hemorrhagic fever and this should guide the treating physician to look for cardiac involvement. This research will be helpful for careful monitoring of arrhythmias in critical phase of dengue hemorrhagic fever patients and results in decrease morbidity in dengue hemorrhagic patients in our community.

CONCLUSION

Dengue virus induced arrhythmias were under reported but it is an important complication in dengue hemorrhagic fever patients. Bradycardia is one of cardiac complication can be present in critical phase of Dengue Hemorrhagic fever patients. Strict monitoring of patients with bradycardia is required in critical phase of Dengue Hemorrhagic fever patients.

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