International Journal of Advances in Medicine
Bajpai G et al. Int J Adv Med. 2022 Jun;9(6):647-650
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: https://dx.doi.org/10.18203/2349-3933.ijam20221330

Original Research Article

Radiological features of dengue fever in cases and control

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Received: 22 April 2022
Accepted: 09 May 2022

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ABSTRACT

Background: Dengue (pronounced Dengee) fever is a painful, debilitating mosquito-borne disease caused by any one of four closely related dengue viruses. Aim of the study was to study radiological features of dengue fever in cases and control.
Methods: Randomized, double blind, placebo controlled, parallel group study conducted among 100 seropositive dengue patients,18-60 years of age (fulfilling inclusion and exclusion criteria) at Lala Lajpat Rai hospital, Kanpur for December 2019 October 2021. Selected patients were subjected to history, examination, necessary investigations and then were managed according to national vector borne disease control programme (NVBDCP) guidelines. A total of 100 serology proven dengue patients were included and followed up. Two groups (fifty in each) were allocated by simple first and then systematic random sampling. Case group was given doxycycline and control group was given placebo.
Results: USG findings commonly seen in both the cases and control group were hepatomegaly, splenomegaly, ascites right pleural effusion, thickened GB wall and edema. In both the groups, pleural effusion was the most common complication.
Conclusions: Ultrasound examinations detected plasma leakage in multiple body compartments around time of defervescence. Presence of plasma leakage in form of ascites and pleural effusion was more in control group as compared to case group seems doxycycline decrease the plasma leakage. Pleural effusion is most common finding of plasma leakage.

Keywords: Dengue, Doxycycline, Radiological

INTRODUCTION

Dengue fever is an arthropod-borne viral haemorrhagic fever caused by arbovirus of flavivirus genus having 4 serotypes and concerned vectors like *Aedes aegypti* and *Aedes albopictus* mosquitoes. As per estimate of WHO (May 2021) there are an estimated 100-400 million infection each year world-wide. One recent estimate indicates 390 million dengue infections per year (95% credible interval 284-528 million), of which 96 million (67-136 million) manifests clinically (with any severity of disease).[1] Another study, of the prevalence of dengue, estimates that 3.9 billion people, in 128 countries, are at risk of infection with dengue viruses.[2] A clinical manifestation ranges from self-limiting fever to profound hemorrhage, shock and death.

Dengue fever is described clinically as an acute febrile illness of 2-7 days duration with two or more of the following symptoms headache, rash, retro-orbital pain, myalgia, arthralgia, hemorrhagic tendencies.[3]

Ultrasonography is easily and widely available non-invasive imaging modality to assess complications in dengue fever. Plasma leakage was detected by ultrasound as early as three days after onset of fever. Several studies have proven that ultrasonography of the chest and abdomen can be an important adjunct to clinical profile in early diagnosis of dengue fever.[4]

METHODS

Randomized, double blind, placebo controlled, parallel group study conducted among 100 seropositive dengue patients,18-60 years of age (fulfilling inclusion and exclusion criteria) at Lala Lajpat Rai hospital, Kanpur for dec 2019-October 2021. Selected patients were subjected to history, examination, necessary investigations and then were managed according to national vector borne disease control programme (NVBDCP) guidelines. A total of 100 serology proven dengue patients were included and followed up. Two groups (fifty in each) were allocated by simple first and then systematic random sampling. Case group was given doxycycline 100 mg bd for a period of 5 days and control group was given placebo.

Inclusion criteria

Serology confirmed dengue patients (NS1Ag or IgM Ab or both; by ELISA method), patient who give written consent to participate in the study, male or non-pregnant, non-lactating female between 18-60 years of age, diagnosis of uncomplicated DF as defined by (a)-acute febrile illness (axillary $\geq 98.6^0$ F or oral $\geq 99.5^0$ F) with two or more of the following: Headache, retro-orbital pain, myalgia, arthralgia, leukopenia, thrombocytopenia, no evidence of plasma leakage and (b) a positive result for dengue infection on NS1 (kit or ELISA), onset of fever less than or equal to 3 days before randomization were included from the study.

Exclusion criteria

Unwilling patients, patients with associated infection (bacterial/ viral/ parasitic), patients with co-morbidities (heart diseases, chronic liver disease, chronic kidney disease etc.), patients admitted with complications of dengue (hemorrhage, shock, acute respiratory distress syndrome, plasma leakage), patients with DF with warning signs and symptoms, patients with afebrile period without use of paracetamol for 24 hours preceding randomization, history of recent (<120 days of screening) transfusion of platelets or whole blood were excluded from the study.

Study technique

The study was conducted at post graduate KPS institute of medicine GSVM medical college Kanpur from December 2019 to October 2021. All the patients fitting inclusion and exclusion criteria were studied that is patient suffering from dengue fever attending medicine OPD, needing admission in medicine department were evaluated for the study. After written informed consent and after history and clinical examination blood samples on the first day, third day and seventh day were drawn for routine complete hemogram, liver function test, renal function test. similarly, X-ray chest and ultra-sonography of whole abdomen electrocardiogram was done on first, third, and seventh day to exclude complications like pleural effusion, ascites or GB edema and any co-morbidities.

Tools of study

Pre-designed proforma with history clinical examination and blood reports with dengue viral serology, automated analyzer for biochemical and pathological test, machine for dengue viral serology, X-ray chest machine, ultrasonography machine and ECG machine

RESULTS

The 100 seropositive dengue patients were included in the study with Male to female ratio being 1.12:1. Age and sex composition between the cases and control group were similar (Figure 1 and 2). Majority of cases and control fell in 21-40 years (58%) age group.

USG findings commonly seen in both the cases and control group were hepatomegaly, splenomegaly, ascites right pleural effusion, thickened GB wall and edema.

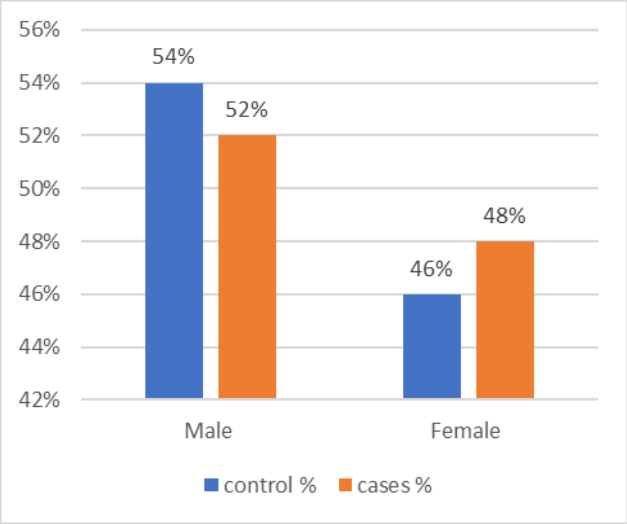

Figure 1: Gender wise distribution of patients.

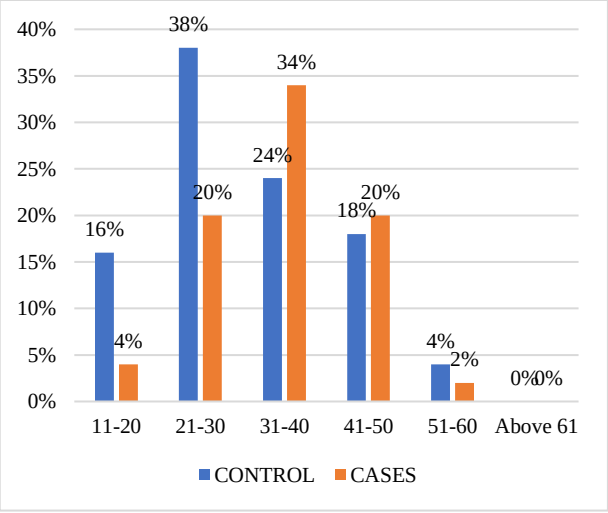

Figure 2: Age wise distribution of cases and control.

Table 1: Radiological findings in patients.

Findings	No. of patients (control)	No. of patients (cases)	Percentage (%)
Ascites	11	10	21
Pleural effusion	21	15	36
Organomegaly	9	6	15
Gb thickening and edema	13	12	25
Normal	13	16	29

*More than one finding was seen in single patient.

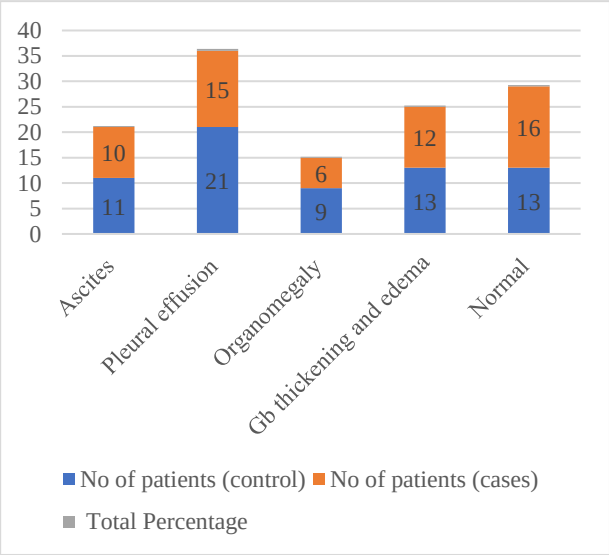

Figure 3: Radiological findings in patients.

In this study, in both groups, pleural effusion is the most common complication i.e., cases (15), control (21) corresponding to 36% followed by gall bladder thickening and edema cases (12), control (13) corresponding to 25%, no complications seen in 29% cases and controls. In both groups, pleural effusion the most common complication.

DISCUSSION

The present study entitled "the study of clinical hematological hepatic and renal profile in dengue fever and role of doxycycline in treatment of dengue fever" was carried out in post graduate, KPS institute of medicine, G.S.V.M. medical college, Kanpur from December 2019 to October 2021.

The 100 seropositive dengue patients were included in the study and were divided into two groups on the basis of treatment (tablet doxycycline) received by patient or not, 50 patients who received doxycycline were considered as cases and the remaining 50 patients who received placebo pill were considered as control group with male to female ratio being 1.12:1. Age and sex composition between the cases and control group were similar and was in accordance with Bhattacharjee et al.[5] Majority of cases and control fell in 21-40 years (58%) age group and comparable with study of Deshwal et al in which majority of patients fell in 21-40 age group (62.91%).[6]

USG findings commonly seen in both the cases and control group were hepatomegaly, splenomegaly, ascites right pleural effusion, thickened GB wall and edema. In this study, in both the groups, pleural effusion is the most common complication i.e., cases (15), control (21) corresponding to 36% followed by gall bladder thickening and edema cases (12), control (13) corresponding to 25%, no complications were seen in 29% cases and controls.

In both the groups, pleural effusion was the most common complication and was comparable with study of Srikiatkhachorn et al states pleural effusion was the most common ultrasonographic sign of plasma leakage (62%), thickening of the gallbladder wall and ascites were detected less frequently (43%) cases.[7] According to Khurram et al mild abdominal ascites 68 (47.2%), right pleural effusion 82 (74.5%) and mild pleural effusion 98 (89%) were commonly noted.[8]

CONCLUSION

Dengue is a disease affecting younger age group, no gender disproportion was seen in our study. Ultrasound examinations detected plasma leakage in multiple body compartments around time of defervescence. Presence of plasma leakage in form of ascites and pleural effusion was more in control group as compared to case group seems doxycycline decrease the plasma leakage. Pleural effusion is most common finding of plasma leakage.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Bajpai G, Verma RK. Radiological features of dengue fever in cases and control. Int J Adv Med 2022;9:647-50.