Original Research Paper

Volume - 14 | Issue - 05 | May - 2024 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

General Medicine

STUDY OF ORGAN SYSTEM INVOLVEMENT IN SEVERE DENGUE FEVER CASES ADMITTED TO A TERTIARY HEALTH CARE CENTRE

Dr. Rahul Siwach Junior Resident, Department of General Medicine, Jaipur National University, Institute for Medical Sciences and Research Centre

Dr. Aditi Arora Junior Resident, Department of General Medicine, Jaipur National University, Institute for Medical Sciences and Research Centre

Dr. Karan Beniwal Senior Resident, Department of General Medicine, Jaipur National University, Institute for Medical Sciences and Research Centre

ABSTRACT **Objective:** 1. To study the clinical profile & laboratory diagnostic findings in severe Dengue fever cases.
2. To compare the pattern of organ involvement with severe Dengue Fever (DF) cases admitted in 2023-2024.

Materials and Methods: This Descriptive Longitudinal Study, conducted at a tertiary care center in India, focused on severe dengue cases admitted between January 2023 and May 2024. Group A comprised 54 patients, where detailed history-taking and clinical examinations were performed to evaluate severity and complications. Data analysis encompassed the period from January 2023 to May 2024 for Group A. Comparison was made with Group B, consisting of 53 severe dengue cases from 2021-2022, to assess the pattern of organ involvement using identical inclusion and exclusion criteria. Informed consent was obtained from patients or relatives, with data collection conducted via structured clinical Performa. Routine and special investigations were carried out, including NS1Ag and IgM Dengue detection using government-supplied kits. **Results:** Both Group A and Group B showed a male predominance (61% and 68% respectively) and were primarily aged 18 to 30 years (70% and 60% respectively). While presenting symptoms were similar, Group A exhibited higher prevalence of cough, difficulty breathing, convulsions, and petechiae. Hemorrhagic manifestations were more frequent in Group A (40%). Thrombocytopenia was universal, with 72% of Group A and 78% of Group B cases having platelet counts below 50,000 /cu mm. Elevated SGOT and SGPT levels were seen in 13% and 6% of Group A cases respectively. Pleural effusion and acute respiratory distress syndrome (ARDS) were more common in Group A on chest X-ray. Dengue hemorrhagic fever (DHF) I was more prevalent in Group B (72%), while DHF II-IV were more common in Group A. Complications such as coagulopathy, acute renal failure, ARDS, and hepatitis were more frequent in Group A. The mortality rate was higher in Group A (9%) compared to Group B (6%). **Conclusions:** In summary, our study underscores the wide range of symptoms and complications seen in severe dengue cases, from mild fever to life-threatening organ failure. We noted a higher occurrence among young adult males aged 18-30. Between 2023-2024, there was a rise in severe complications such as serositis, thrombocytopenia, and hepatic, respiratory, renal, and neurological issues. Dengue shock syndrome and hemorrhagic fever had notably higher mortality rates during this period, emphasizing the importance of vigilant management to address severe dengue infections effectively.

KEYWORDS : Severe dengue fever, multiorgan involvement, dengue shock syndrome, dengue hemorrhagic fever.

INTRODUCTION

Dengue, an arthropod-borne viral infection caused by a flavivirus, has reached epidemic proportions globally, with an alarming surge in recent years. According to the World Health Organization (WHO), annually, 50 to 100 million new cases are reported in over 100 endemic countries[1], particularly affecting tropical regions where it poses significant morbidity and mortality threats. Transmission occurs primarily through female Aedes mosquitoes, predominantly Aedes aegypti and to a lesser extent, Ae. albopictus. The virus comprises four serotypes (DENV-1, DENV-2, DENV-3, and DENV-4) of epidemiological significance, manifesting a wide spectrum of diseases from subclinical infections to severe flu-like symptoms. Symptoms typically manifest four to six days post-infection and can persist for up to ten days, encompassing high-grade fever, severe headaches, ocular pain, joint and muscle pain, fatigue, nausea, vomiting, and a characteristic skin rash. Severe dengue, although less common, can lead to various complications such as severe bleeding, organ dysfunction, and plasma leakage, posing a higher risk of mortality if not managed effectively. Hematological and biochemical parameters, including increased hematocrit, decreased serum albumin, reduced platelet count, and elevated levels of aspartate transaminase (SGPT) and alanine transaminase (SGOT), serve as vital indicators for identifying patients with plasma leakage in severe dengue infection. Currently, meticulous fluid management and complication monitoring remain the mainstay of treatment, as there is no effective antiviral therapy or licensed vaccine available for prevention. While most cases resolve without complications, a subset can develop severe morbidity and mortality due to dysfunction of one or more organs, particularly cardiovascular, hepatic, renal, and central nervous systems, with respiratory and muscular systems also being affected to some extent. This study aims to analyze the spectrum of complications observed in severe dengue patients, with a specific focus on atypical organ involvement, while also correlating findings with historical cases admitted to our institution, thereby contributing to a better understanding of dengue-related morbidity and mortality trends over time.

MATERIALS AND METHODS

The study, conducted in the Department of General Medicine at a tertiary healthcare hospital in Jaipur, India, from January 2023 to May 2024, employed a Descriptive Longitudinal Study design. All indoor patients diagnosed with severe Dengue fever and admitted to the medicine wards/ICU during 2023-24 were included, with a sample size of 53 determined based on a proportion of 5.6% severe dengue cases among Dengue patients admitted in 2023, a margin of error of 6%, and a significance level of 95%. Informed consent was obtained, and data were collected using a structured clinical Performa to record chief complaints, medical history, and demographic details, alongside general physical examinations. Investigations included routine and special tests such as CBC, LFT, RFT, urine analysis, NS1Ag, and IgM Dengue. Additional investigations like PT/INR/APTT, ECG, Chest X-Ray, and USG abdomen were performed as needed. Comparison data from previous years (Group B) were obtained from hospital records, with 53 patients from 2022-2023 included for comparison. These comparisons followed the same inclusion and exclusion criteria as Group A.

Inclusion Criteria

- Patients aged >18 years.
- All patients diagnosed with confirmed Severe Dengue Fever and admitted to medicine wards, meeting the criteria for Dengue Hemorrhagic Fever (DHF) I-IV or exhibiting significant dysfunction of any vital organ during their hospital stay, as defined by the World Health Organization (WHO) and the National Vector Borne Disease Control Programme (NVDCP) (refer to Pages 41 and 45 of the respective guidelines).
- Patients willing to participate in the study and providing informed consent.

Exclusion Criteria (Any of the following):

- Patients aged less than 18 years.
- Patients co-infected with other diseases such as malaria and typhoid.
- Patients with co-morbid conditions including stroke, chronic heart/lung diseases, chronic kidney disease, malignancy, hypertension, and diabetes, among others.

- Patients unwilling to participate or unable to provide consent for the study.

RESULTS

Statistical methods utilized in the study involved data entry using MS Excel Spreadsheet and analysis with OpenEpi version 3.01. Descriptive statistics were employed to present the data in terms of frequency and percentage. Significance testing was conducted using ANOVA and Chi-square tests, with a confidence interval set at 95%. A p-value less than 0.05 was considered statistically significant. In the current study (Group A), out of 54 cases examined, males constituted 61% of the patients, while females made up 39%. There was a notable preponderance of males among patients admitted with or developing severe dengue fever, with a Male/Female ratio of 1.5:1. Similarly, in Group B, 68% of cases were male and 32% were female, with no statistically significant difference between the gender distributions observed (P-value > 0.05).Regarding age distribution, the majority of severe dengue fever cases occurred in the age group of 18-30 years, accounting for 70% of cases. A smaller proportion, 24%, fell within the 31-50 age range, while only 6% were older than 50 years. Notably, the predominant age group affected was between 18-30 years, constituting 94% of cases among young individuals aged 18-50 years. In both Group A and Group B, a substantial number of cases were observed in the 18-30 age bracket, comprising 70% and 60% of cases, respectively. Moreover, while 24% of Group A cases and 40% of Group B cases were aged 31-50 years, only 6% of severe dengue fever cases in Group A were over 50 years old, with none in Group B. However, no statistically significant difference in age distribution was found between the two groups (P-value > 0.05). Comparing the mean ages between Group A and Group B, Group A exhibited younger patients, with a mean age of 27.72 ± 12 years, while Group B had a slightly higher mean age of 29.98 ± 7.7 years. Although Group A involved younger individuals overall, the difference in mean age between the two groups was not statistically significant (P-value = 0.1629). Constitutional symptoms such as fever and body ache/headache were universally present in all severe dengue fever cases, with fever and body ache/headache being the most common symptoms, noted in 100% of cases. Myalgia was reported in 77% of cases, while retro-orbital pain was less common, affecting 40% of patients. In the cohort examined, gastrointestinal symptoms were prevalent, with nausea reported in 77% of cases, followed by vomiting in 70%, and abdominal pain in 50% of patients. However, diarrhea and abdominal distension were less common, noted in only 14% and 11% of cases, respectively. Respiratory symptoms were observed in a subset of patients, with cough reported in 37% and difficulty in breathing in 25% of cases. Hemorrhagic manifestations were noted in a significant proportion of patients, with bleeding gums and petechiae each affecting 40% of cases. Hematuria was relatively rare, occurring in only 2% of patients. Less frequently observed symptoms included decreased urine output (3%), convulsions (2%), and chest pain (3%). Constitutional symptoms were ubiquitous among severe dengue fever cases, with fever present in 100% of cases across both Group A and Group B. Body ache/headache was noted in all cases in Group A and 88% of cases in Group B. Myalgia affected 77% of patients in Group A and 66% in Group B. Retro-orbital pain was reported in 40% of cases in Group A and 50% in Group B. Consequently, while body ache/headache and myalgia were more prevalent in Group A, retro-orbital pain was more common in Group B. In terms of gastrointestinal symptoms, nausea was reported in a similar proportion of cases in both groups, with 77% in Group A and 75% in Group B. Vomiting was slightly more prevalent in Group A, affecting 70% of cases compared to 62% in Group B. Notably, diarrhea was significantly more common in Group A, present in 14% of cases, whereas it affected 50% of cases in Group B (P value < 0.0001). Abdominal pain was more frequently observed in Group A, with 50% of cases reporting this symptom compared to 33% in Group B. Abdominal distention was noted in 11% of cases in Group A and 9% in Group B. Regarding hemorrhagic manifestations, bleeding gums were more prevalent in Group A (40%) than in Group B (11%), a statistically significant difference (P-value 0.0006). Petechiae/purpura were more common in Group A (40%) compared to Group B (23%), although this difference did not reach statistical significance (P-value 0.0586). In the respiratory system, cough was reported more frequently in Group A (37%) than in Group B (11%), a statistically significant difference with a P-value of 0.0017. Difficulty in breathing was more prevalent in Group A (25%) compared to Group B (11%), although this difference was not statistically significant (P-value > 0.05). Chest pain was observed in 3% of cases in Group A and 5% in Group B. Decreased urine output was noted in 3% of cases in Group A and 7% in Group B. Convulsions were the least frequent, reported in 2% of cases, with no statistically significant difference between the two groups (P-value > 0.05). Hematuria was noted in 2% of cases in Group A but none in Group B. In the study cohort, all cases presented with pyrexia, followed by tachycardia in 66% of cases, hypotension in 33%, and tachypnea in 25% of cases. In terms of gastrointestinal signs, ascites was the most common, present in 62% of cases, followed by hepatomegaly (33%) and splenomegaly (9%), though the latter was rare. Petechiae were observed in 40% of cases, with a positive tourniquet test in 18% of cases. Pleural effusion was noted in 38% of cases, while altered sensorium occurred in 3% of cases, reflecting a rare manifestation of severe dengue fever. However, icterus, pallor, and pedal edema were not observed in the study. Comparison between Group A and Group B revealed that pyrexia was universally present in both groups, being the most common sign. Group A exhibited higher rates of tachycardia (66% vs. 35%), ascites (62% vs. 26%), pleural effusion (38% vs. 18%), and splenomegaly (9% vs. 0%). These differences were statistically significant with a P-value of <0.05 in both groups. Petechiae were more common in Group A (40%) compared to Group B (23%), while a positive tourniquet test was noted in 18% of Group A cases and 9% of Group B cases. Hepatomegaly was slightly more prevalent in Group A (33% vs. 26%), and hypotension was more common in Group A (33% vs. 18%). Tachypnea was also more frequent in Group A (25% vs. 13%). However, the differences in petechiae, a positive tourniquet test, hepatomegaly, hypotension, and tachypnea were not statistically significant (P-value >0.05) between the two groups. Bleeding gums and petechiae/purpura were the most common hemorrhagic manifestations, each observed in 40% of cases. Black stool was noted in 24% of cases, while epistaxis and hematuria were rare, each occurring in 3% and 2% of cases respectively. No cases of hemoptysis or hematemesis were observed. Bleeding gums were significantly more common in Group A (40%) compared to Group B (13%) according to the chi-square test with a 95% confidence interval (P-value = 0.0016). Petechiae/purpura, a common hemorrhagic manifestation, was notably more prevalent in Group A, with 40% of cases exhibiting this symptom compared to 22% in Group B. This discrepancy was statistically significant, with a calculated P-value of 0.0443. While a slightly higher proportion of patients in Group A (24%) reported a history of passing black stool compared to those in Group B (18%), this difference did not reach statistical significance (P-value >0.05). Likewise, the incidence of epistaxis was comparable between the two groups, with 3% in Group A and 2% in Group B. Hematuria was observed in only 2% of cases in Group A, whereas no cases were reported in Group B. There were no instances of hematemesis or hemoptysis in either group. Overall, hemorrhagic manifestations were more prevalent in Group A (40%) compared to Group B (22%), demonstrating statistical significance with a P-value of 0.0443. Regarding diagnostic testing, NS1 Ag positivity was more frequent in both groups, with 61% in Group A and 43% in Group B. This was followed by cases positive for NS1 Ag + IgM dengue antibody, which were noted in 24% of cases in Group A and 34% in Group B, indicating a higher proportion in Group B. In Group B, there was a higher prevalence of IgM dengue antibody-positive cases (23%) compared to Group A (15%). Among the laboratory parameters, the mean hemoglobin ± SD for males was 13.81 ± 2.1 in Group A and 13.28 ± 1.97 in Group B, while for females it was 11.06 ± 1.9 in Group A and 11.13 ± 1.83 in Group B. There was no statistically significant difference observed between the two groups (P-value < 0.05). The mean white blood cell count ± SD was 6.44 ± 5.23 in Group A and 6.49 ± 2.65 in Group B, with no significant difference detected. Both groups exhibited slightly higher mean hematocrit ± SD values. The mean platelets ± SD count was below 40,000/cu mm in both groups. The mean prothrombin time/activated partial thromboplastin time ± SD was mildly elevated in both groups. Mean SGOT/SGPT ± SD was higher in Group A compared to Group B, while mean albumin ± SD was lower in Group A (3.23 ± 0.45) than in Group B (3.37 ± 0.34). Mean urea ± SD was higher in both groups, while mean creatinine ± SD was similar in both. Most severe dengue cases (72%) had platelet counts less than 50,000/µl. Platelet counts between 50,001-100,000/µl were more prevalent in Group A (22%) compared to Group B (18%). Platelet counts between 100,001–1,50,000/µl were observed in 6% of Group A cases and 2% of Group B cases. Platelet counts exceeding 1,50,000/µl were found in 2% of Group B cases and none in Group A. However, there was no statistically significant difference between the two groups (P-value >0.05). In the present study, the mean platelet count ± SD was 37,777 ± 30,128.44 in Group A and 34,471 ± 29,468.10 in Group B, indicating a reduction in both groups. However, after applying the Chi-square test with a 95% confidence interval, the difference between the groups was found to be nonsignificant (P-value = 0.4666). The wide range of platelet values in both groups is reflected by the high standard deviation from the mean, with 95% of patients in Group A having platelet values between 7749 to 67,905/cu mm and

patients in Group B having values between 5003 to 63,939/cu mm. In dengue fever, SGOT values typically rise more than SGPT values. In this study, the majority of patients had SGPT and SGOT values within the range of 41 to 300 U/L in both groups. In Group A, 7% of cases and in Group B, 11% of cases showed SGOT within the normal limit (<40 U/L), while approximately 80% of cases exhibited elevated SGOT levels (between 41-1000 U/L) in both groups. Notably, SGOT levels exceeding 1000 U/L were more prevalent in Group A (13%) compared to Group B (no cases), indicating a statistically significant difference (P-value = 0.0066). Regarding SGPT levels, 22% of cases in Group A and 30% of cases in Group B had SGPT within the normal limit. However, 6% of cases in Group A had higher SGPT levels (>1000 U/L), which were not observed in Group B. Approximately 70% of cases in both groups showed SGPT levels between 41-1000 U/L, with no statistically significant difference between the groups (P-value >0.05). Additionally, the presence of higher SGPT levels (>1000 U/L) showed no statistically significant difference (P-value = 0.0702). The mean SGOT ± SD in Group A was 576.25 ± 1406.60, while in Group B it was 195.56 ± 172.32. Similarly, the mean SGPT ± SD in Group A was 262.01 ± 575.89, whereas in Group B it was 111.54 ± 121.33. However, due to extreme values of SGOT and SGPT in some patients, the p-value was not feasible for this data. Therefore, for a more meaningful comparison, median, range, and interquartile ranges were considered. Out of 54 cases, a normal hematocrit value was observed in 37 (69%) cases, decreased hematocrit value in 5 (9%) cases, and increased hematocrit in 12 (22%) cases. Normal hematocrit was seen in 69% of cases in Group A and 77% of cases in Group B, with no statistically significant difference (P-value >0.05). Increased hematocrit values were noted in 22% of cases in Group A and 15% of cases in Group B. Comparison of mean hematocrit and SD between the groups yielded a non-significant result (P-value = 0.6032). Ultrasound findings revealed that gallbladder wall edema (62%) and ascites (62%) were the most common in both groups. Gallbladder wall edema was more frequently observed in Group A (62%) compared to Group B (32%), while ascites was also more prevalent in Group A (62%) compared to Group B (26%). Splenomegaly was noted more in Group A (9%) compared to Group B, where no cases were observed, showing a statistically significant difference between the groups (P-value <0.05). Hepatomegaly was observed in 33% of cases in Group A and 26% in Group B, with no statistically significant difference between the two groups (P-value >0.05). Out of 54 cases, pleural effusion was noted in 24% of cases, while pleural effusion combined with ARDS was noted in 18% of cases. ARDS without pleural effusion was observed in only 2% of cases. Although pleural effusion was more prevalent in Group A (22%) compared to Group B (11%), no statistically significant difference was observed (P-value 0.1258). Similarly, pleural effusion combined with ARDS was noted in 18% of cases in Group A and 11% in Group B, with no statistically significant difference between the groups (P-value >0.05). ARDS alone was noted in 2% of cases in Group A and was not observed in Group B, though this difference was not statistically significant (P-value >0.05). In the study, 32% of cases in Group A and 72% in Group B had DHF-I, indicating a higher prevalence in Group B. DHF-II was more prevalent in Group A (35%) compared to Group B (11%), showing a statistically significant difference (P-value <0.05) after applying the chi-square test with a 95% confidence interval. DHF-III was observed in more cases in Group A (26%) compared to Group B (13%), but no statistically significant difference was found between the two groups (P-value 0.0901). DHF-IV was less common, but more prevalent in Group A (7%) compared to Group B (4%), although no statistically significant difference was observed (P-value 0.4967). Out of 54 patients, thrombocytopenia was present in 72% of cases. Serositis (including ascites/pleural effusion) was noted in 61% of cases. Coagulopathy (including altered PT/INR/aPTT, bleeding gums) was seen in 44% of cases. A limited number of cases of hypotensive shock (33%) and ARDS (18%) were observed. Acute renal failure was seen in 6 cases (11% of cases), and hepatitis was noted in 13% of cases. Encephalopathy was rare in Group A, with only 3% of cases noted in the present study. Hepatic encephalopathy and myocarditis were not observed in the present study. Thrombocytopenia was noted in 72% of cases in Group A and 78% in Group B. Serositis was more prevalent in Group A (61%) compared to Group B (32%), with a statistically significant difference observed (P-value = 0.0019). Hypotensive shock was more common in both Group A (33%) and Group B (18%). ARDS was observed more frequently in Group A (18%) compared to Group B (11%), although no statistically significant difference was found (P-value >0.05).

Coagulopathy, including altered coagulation profiles and bleeding gums, was more prevalent in Group A (44%) compared to Group B (11%), with a statistically significant difference noted (P-value = 0.0001). Acute renal failure was more commonly seen in Group A (11%) compared to Group B (3%), although no statistically significant difference was observed between the groups (P-value >0.05). Hepatitis was more prevalent in Group A (13%) compared to Group B (no cases), with a statistically significant difference noted (P-value = 0.0066). Encephalopathy was a rare manifestation in both groups, with 3% in Group A and 2% in Group B, and no statistically significant difference was observed (P-value >0.05). No cases of hepatic encephalopathy or myocarditis were observed. Coagulation system dysfunction was noted in 72% of cases. Gastrointestinal system involvement was more common in Group A (61%) compared to Group B (32%), while respiratory system involvement was also more prevalent in Group A (44%) compared to Group B (22%). Circulatory system involvement was also more frequent in Group A (61%) compared to Group B (30%), with a statistically significant difference observed between the groups (P-value <0.05). Renal involvement was more common in Group A (11%) compared to Group B (3%), although no statistically significant difference was observed between the two groups (P-value = 0.1507). Central nervous system involvement was rare, with 3% in Group A and 2% in Group B. In the study, death occurred in 5 (9%) cases of severe dengue fever in Group A and 3 (6%) cases in Group B. Although more deaths were noted in Group A compared to Group B, no statistically significant difference was found between the two groups (P-value = 0.5562). few in number, we have correlated our findings with studies involving uncomplicated dengue fever also.

Comparison of presenting symptoms (%)

Symptoms	Present study		Viru-paksha K.L et al[2] (2019) (n=100)	Mohd Jahid Hasan et al [5] (2019) (n=553)	Sultana et al [6] (2018) (n=350)	Anish Laul et al [8] (2016) (n=115)	Dinesh P Vasu et.al [3] (2016-18) (n=513)
	GRP A (2023-24) (n=54)	GRP B (2022-23) (n=53)					
Fever	100	100	100	100	100	100	99.66
Body ache /headache	100	88	90	62.7	62.7	86	48.18
Myalgia	77	66	64	-	44	-	71.94
Nausea	77	75	55	69.6	-	78	-
Vomiting	70	62	55	69.6	-	78	46
Abdominal pain	50	33	76	41.6	32.86	65	35.47
Bleeding gums	40	11	23	3.6	-	21	2.64
Retro orbital pain	40	50	46	39.1	20.29	41	-
Petechiae/ purpura	40	23	35	4.5	6	21	20.79
Cough	37	11	-	5.4	-	-	-
Difficulty in breathing	25	11	5	4.5	-	19	15.01
Diarrhea	14	50	-	26.2	5.14	27	0.33
Abd distension	11	9	-	41.6	-	-	-
Chest pain	3	5	-	-	-	-	-
↓urine output	3	7	-	0.2	-	-	-
Convulsion	2	0	-	0.2	-	2	-

DISCUSSION

Among our 54 cases in Group A, 61% were males and 39% females, yielding a male-to-female ratio of 1.5:1. In Group B, out of 53 cases, 68% were males and 32% were females, with a male-to-female ratio of 2.1:1. In the study by Virupaksha K.L et al.[2], the male-to-female ratio was 2.5:1, while in the study by Dinesh P Vasu et al.[3], it was 1.4:1. Both studies similarly indicated a higher incidence among males, consistent with our findings. Nikhil Victor Dsouza et al.[4] reported a male-to-female ratio of 2:1, Mohammad Jahid Hasan et al.[5] found a ratio of 1.7:1, Sultana et al.[6] observed a ratio of 2.1:1, and Shamsun Khatroth et al.[7] reported a ratio of 2:1. Pervin et al.[8] found a ratio of 1.7:1. These results collectively affirm a male predominance in dengue cases, consistent with our observations and findings from other studies in India. In our study, the most affected age group was 18-30 years (Group A: 70%, Group B: 60%), followed by 31-50 years (Group A: 24%, Group B: 40%). This aligns with findings from Virupaksha K.L et al.[2] and Dinesh P Vasu et.al,[3] where the predominant age group was also 31-50 years. The mean ages in our study (Group A: 27.72, Group B: 29.98) were comparable to other studies, such as Mohammad Jahid

Hasan et al.[5] (27 years), Sultana et al.[6] (25 years), Shamsunder Khatroth[7] (31.29 years), and Anish Laul et al. (31.36 ± 13.17 years). Regarding symptoms, fever and body ache/headache were prevalent in all cases (100%) in both groups, consistent with other studies. Hemorrhagic manifestations were more frequent in Group A, with 40% having bleeding gums and 40% having petechiae, compared to Group B and other studies. Diarrhea was more common in Group B (50%) than Group A (14%) and other studies. Abdominal pain was noted in 50% of Group A cases and 33% of Group B cases, similar to findings from other studies. Retroorbital pain was observed in 40% of Group A cases, while it was more prevalent in Group B (50%) compared to other studies. Decreased urine output was present in 3% of Group A cases and 7% of Group B cases, consistent with findings from other studies. Convulsions were seen in 2% of Group A cases and no cases in Group B, similar to findings by Mohammad Jahid Hasan et al.[5]Group A exhibited a higher prevalence of difficulty in breathing (25%) compared to Group B (11%), consistent with findings from some studies but not others. Cough was more common in Group A (37%) compared to Group B (11%) and other studies. It's worth noting that studies by Mohammad Jahid Hasan et al.[5], Sultana et al.[6], and Anish Laul et al. included only uncomplicated dengue cases, while Virupaksha K.L et al. [2] and Dinesh P Vasu et.al studies encompassed all dengue categories, with severe cases being a minority. This likely explains variations in symptoms like cough, chest pain, decreased urine output, and convulsions across studies. In our study, ascites was prevalent in 62% of Group A cases and 26% of Group B cases, differing from findings in Mohammad Jahid Hasan et al.[5] (1.26% cases) and T. Sreenivasulu et al. (10% cases) studies. These disparities underscore the impact of including severe dengue cases on symptom presentation variability. In Group A, hypotension was present in 33% of cases, compared to 18% in Group B, 25% in Mohammad Jahid Hasan et al.[5] study, and 5% in T. Sreenivasulu et al. study. Pleural effusion was noted in 38% of Group A cases and 18% of Group B cases, contrasting with 6% and 1.6% in T. Sreenivasulu et al. and Mohammad Jahid Hasan et al.[5] studies, respectively. A positive tourniquet test was observed in 18% of Group A cases, 9% of Group B cases, and 10.5% in Mohammad Jahid Hasan et al.[5] study. Petechiae were evident in 38% of Group A cases, 22% of Group B cases, 19% in T. Sreenivasulu et al. study, and 4.5% in Mohammad Jahid Hasan et al.[5] study. Hepatomegaly and splenomegaly were present in 33% and 9% of Group A cases, respectively, compared to 26% and 0% in Group B. T. Sreenivasulu et al. reported a higher incidence of hepatomegaly (56%) and splenomegaly (46%). These findings indicate a greater prevalence of manifestations such as third space loss and bleeding tendency in Group A compared to Group B, as well as compared to Mohammad Jahid Hasan et al.[5] and T. Sreenivasulu et al. studies.

Mohammad Jahid Hasan et al.[5]'s study solely focused on uncomplicated dengue cases, while Sreenivasulu T et al.'s study encompassed all dengue categories, with only a small fraction being severe cases (12 out of 100). This discrepancy explains variations in signs like ascites, pleural effusion, bleeding manifestations, and organ failure compared to our study. NS1 Ag seropositivity was more common in Group A (61%) and Group B (43%), followed by NS1 Ag & IgM Ab positivity (24% in both groups). IgM seropositivity was noted in 15% of Group A cases and 23% of Group B cases. Similar findings were reported by Virupaksha K.L et al. [2], where NS1 Ag seropositivity was 81%, NS1 Ag & IgM Ab was 12%, and IgM Ab was 7%. Dinesh P Vasu et.al found 67% NS1 Ag positivity and 33% IgM positivity. NS1 Ag is typically detected 3-5 days after symptom onset, while IgM Dengue usually becomes positive around 5-7 days. In our study, a higher proportion of cases had platelet counts < 50,000/cu mm in both groups (72% in Group A, 78% in Group B). Virupaksha K.L et al. [2] reported 53% of cases with platelet counts between 50,001-1,00,000/cu.mm, while Sreenivasulu T et al. found 75% with platelet counts >1,50,000/cu.mm. Severe thrombocytopenia was more prevalent in our study due to its exclusive focus on severe dengue cases, contrasting with studies covering all dengue categories or only uncomplicated cases. Thrombocytopenia emerged as a notable feature in both groups of our study, with 72% of cases in Group A and 78% in Group B exhibiting low platelet counts, aligning with similar findings from studies conducted by Nagarajan Natarajan (86.2%) and Mohammad Jahid Hasan et al.[5] (66.1%). Conversely, elevated hematocrit levels were observed in 22% of Group A cases and 15% of Group B cases, contrasting sharply with the lower incidence reported in Mohammad Jahid Hasan et al.[5]'s study (3.9%). Elevated liver enzyme levels (SGOT/SGPT) were prevalent across both groups of our study, with 93% and 89% of cases in Group A and 78% and 70% in Group B showing increased levels, respectively. These findings were consistent with observations from Mohammad Jahid Hasan et al.[5] and Nagarajan Natarajan et al. Severe thrombocytopenia (platelets < 50,000) was notably more frequent in our study, with 72% of Group A cases and 78% of Group B cases experiencing this complication, compared to lower rates reported in studies by Virupaksha K.L et al. [2] (22%) and T. Sreenivasulu et al. (16%). Serositis, including conditions like pleural effusion and ascites, was more prevalent in our study groups (Group A: 61%, Group B: 32%) compared to Virupaksha K.L et al. [2] (27%). Coagulopathy was notably more common in Group A (44%) compared to Group B (11%) and studies by T. Sreenivasulu et al. (18%) and Virupaksha K.L et al. [2] (7%). Hypotensive shock was less frequently observed in the study by Virupaksha K.L et al. [2] (5%) compared to our study groups (Group A: 33%, Group B: 18%). The incidence of acute respiratory distress syndrome (ARDS) was higher in our study (Group A: 18%, Group B: 11%) compared to Virupaksha K.L et al. [2] (3%) and T. Sreenivasulu et al. (4%). Hepatitis was more prevalent in the studies by Virupaksha K.L et al. [2] (33%) and T. Sreenivasulu et al. (17%) compared to our study groups (Group A: 13%, Group B: 0%). Acute renal failure was more commonly observed in our study (Group A: 11%) compared to Virupaksha K.L et al. [2] (2%) and T. Sreenivasulu et al. (6%). Encephalopathy was observed in 3% of Group A cases and 2% of Group B cases, a pattern consistent with findings from Virupaksha K.L et al.[2]'s study (3%). The occurrence of these complications in our study suggests a potential escalation in disease severity. Unlike previous studies by Virupaksha K.L et al. [2] and T. Sreenivasulu et al., which encompassed all dengue categories, our focus exclusively on severe dengue fever likely contributed to the higher rates of complications. Involvement of the coagulation system, gastrointestinal system, circulatory system, respiratory system, renal system, and neurological system varied between Group A and Group B. Group A exhibited higher rates of complications across these systems compared to Group B and previous studies. For instance, while coagulation abnormalities were noted in 72% of Group A cases and 78% of Group B cases, Virupaksha K.L et al. [2] reported rates of 29% and T. Sreenivasulu et al. reported rates of 35%. In terms of dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS), Group A showed higher proportions (67% and 33%, respectively) compared to Group B (83% and 17%, respectively). These figures deviate from those reported by Virupaksha K.L et al. [2], Dinesh P Vasu et.al,[3] and T. Sreenivasulu et al., indicating potential shifts in disease presentation and severity. Mortality rates were lower in our study (Group A: 9%, Group B: 6%) compared to Virupaksha K.L et al.[2](12%) and T. Sreenivasulu et al. (36%), suggesting improved management strategies or differences in patient populations.

Financial Support And Sponsorship:
Nil.

Conflicts Of Interest:
There are no conflicts of interest.

Ethical Clearance:
Obtained from the ethical committee of the institution.

REFERENCES

1. World Health Organization. (2015, May). Dengue and severe dengue Fact sheet N°117. Retrieved from https://www.who.int/en/news-room/fact-sheets/detail/dengue-and-severe-dengue
2. Dsouza, N. V., Hanaganahalli, B. S., & Kulkarni, V. (2020). Correlation of Clinical Severity and Laboratory Parameters with Various Serotypes in Dengue Virus: A Hospital-Based Study. https://doi.org/10.1155/2020/6658445.
3. Hasan, M. J., Tabassum, T., Sharif, M., Khan, M. A. S., Bipasha, A. R., Basher, A., Islam, M. R., & Amin, M. R. (2021). Comparison of clinical manifestation of dengue fever in Bangladesh: an observation over a decade. *BMC Infectious Diseases, 21*(1), 1113. https://doi.org/10.1186/s12879-021-06788-z.
4. Dhaka Medical College Hospital. (n.d.). Dhaka, Bangladesh, Latitude and longitude coordinates. Retrieved from https://www.latlong.net/place/dhaka-bangladesh-718.html.
5. Khatroth, S. (2017). A Study on Clinical and Hematological Profile of Dengue Fever in a Tertiary Care Hospital. IAIM, 4(8), 96-102.
6. Sultana, N., Fatema, N., Hossain, M. Z., Rahman, M. A., Nehar, N., Yeasmin, M. M., et al. (n.d.). Frequency of dengue infection in febrile patients attended Dhaka Medical College Hospital during January to December, 2016.
7. Sreenivasulu, T., Virupaksha, K. L., & Kavyashree, N. G. (2019). A study of clinical manifestations and complications of dengue fever in a medical college hospital. International Journal of Medical Research and Review, 7(3), 224-230.
8. Vasu, D. P., Gopi, S., & Kulkarni, A. G. (2019). Epidemiological Trends and Clinical Manifestations of Dengue Cases Admitted in a Tertiary Care Hospital, Sullia, Karnataka. National Journal of Community Medicine, 10(3), 176-180.