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ORIGINAL ARTICLE

CLINICAL PROFILE AND OUTCOME OF DENGUE PATIENTS PRESENTING IN A TERTIARY CARE HOSPITAL, BANGLADESH

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Abstract:

Background: *Dengue poses a major public health burden in Bangladesh; particularly during seasonal outbreaks. The 2024 outbreak saw a rise in moderate to severe cases. The aim of study to assess the clinical features, hematological trends, treatment strategies, and outcomes of hospitalized dengue patients during the 2024 outbreak in Dhaka.* ***Methods:*** *A cross sectional study of 935 serologically confirmed dengue patients was conducted at Z.H. Sikder Women's Medical College & Hospital,Dhaka,Bangladeh from March to November 2024. Patients were classified into mild, moderate, and severe groups based on WHO criteria. Clinical data, laboratory trends, and treatment responses were analyzed.* ***Results:*** *Mean age was 31.7±4.8years; 60% were male. Common symptoms were included fever (100%), headache (86.9%), and vomiting (76%). Severe dengue accounted for 28.1% of cases, with bleeding in 28% and thrombocytopenia in 89.7%. Platelet count nadir occurred on Day 5. Elevated SGPT and bleeding were significant mortality predictors. Corticosteroid use in severe cases was associated with clinical improvement. No deaths were reported.* ***Conclusion:*** *Early diagnosis and severity-based management, including selective steroid use, can improve outcomes in dengue patients. Further trials are needed to validate corticosteroid therapy in severe cases.*

Keywords: *Clinical Spectrum, dengue fever, severity of dengue.*

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Introduction

Dengue fever is an acute mosquito-borne viral illness caused by four antigenically distinct serotypes of the dengue virus (DENV-1 to DENV-4), a member of the Flaviviridae family. The primary vector responsible for transmission is the Aedesaegypti mosquito, with Aedesalbopictus also playing a minor role in some regions.[1] Over recent decades, dengue has emerged as the most rapidly spreading vector-borne viral disease globally, with a reported 30-fold increase in incidence since 1960. According to the World Health Organization (WHO), dengue is now endemic in over 100 countries, placing nearly half the global population at risk.[2]

In tropical countries like Bangladesh, dengue outbreaks occur seasonally-most notably during the monsoon and post-monsoon periods-posing a

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substantial burden on public health infrastructure. The clinical spectrum of dengue infection ranges from self-limiting febrile illness to severe manifestations, including dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). These severe forms are marked by plasma leakage, bleeding diatheses, thrombocytopenia, and potentially fatal organ dysfunction.[3] Early clinical recognition and stratificaton of disease severity are vital to initiate timely and appropriate interventions, which can significantly reduce morbidity and mortality.

The pathogenesis of severe dengue involves complex host-pathogen interactions, including immune activation,cytokine storm, and vascular endothelial dysfunction, ultimately leading to increased vascular permeability and hemodynamic instability.[4] Despite ongoing research, no specific antiviral therapy has been approved for dengue virus infection. Thus, the cornerstone of management remains supportive care-comprising fluid resuscitation,antipyretics, and close clinical monitoring. In cases with severe inflammation and bleeding, adjunctive use of corticosteroids has been explored for their potential to suppress the exaggerated immune response and capillary leakage.[5,6]

Although randomized controlled trials on corticosteroid use in dengue have produced mixed results, some observational studies suggest benefits in carefully selected patients, particularly those presenting with severe hemorrhagic manifestations or thrombocytopenia.[7,8] This therapeutic approach remains controversial, but emerging evidence warrants further investigation into its efficacy and safety.

This study was conducted to assess the clinical presentation, hematological trends, treatment strategies, and outcomes of 935 patients with serologically confirmed dengue admitted to Z.H. Sikder Women's Medical College &Hospital,Dhaka, during the 2024 dengue outbreak. Special emphasis was placed on disease categorization, platelet count progression, and the observed impact of corticosteroid therapy in patients with severe dengue manifestations.

Methods:

A cross sectional study was conducted at Z.H. Sikder Women's Medical College & Hospital,Dhaka, from March 2024 to November 2024. The study enrolled 935 patients aged between 16 and 73years, who were evaluated in the Outpatient and Emergency Departments. The male to female ratio among the participants was approximately 3:2. Comprehensive clinical data, laboratory investigations, treatment details, and patient outcomes were systematically recorded. Based on clinical presentation and laboratory results, patients were classified into three categories: Group A (Mild Dengue), comprising NS1antigen-positive individuals with fever and minor symptoms; Group B (Moderate Dengue), including those positive for NS1 and IgM antibodies exhibiting systemic symptoms along with maculopapular rash; and Group C (Severe Dengue with Hemorrhagic Manifestations), defined by IgM positivity combined with bleeding signs, thrombocytopenia, and abnormal biochemical parameters. The inclusion criteria required patients to be positive for dengue NS1 antigen or IgM antibodies and to present clinical features consistent with dengue fever. Patients with co-infections, chronic liver or kidney disease, and pregnant women were excluded from the study to eliminate confounding factors. Treatment protocols were tailored according to disease severity. Patients in Group A received symptomatic management, including intravenous colloid fluids, oral paracetamol, antiemetics, and antiulcer medications. Those in Group B were treated with intravenous fluids (normal saline and Ringer's lactate), intravenous or oral paracetamol, and supportive care. For the Group C cohort, treatment involved intensive care with intravenous fluids; intravenous dexamethasone at a dose of 5 mg every 8 hours tapered from Day 5 onwards, proton pump inhibitors, and close monitoring of platelet counts and electrolyte levels.

Results:

Table I

Demographic and Clinical Overview of the study subject (n=935)

Variables	Number	Percentage
Mean age in years	31.72(±4.82)	16-73 years
Gender		
Male	561	60.0
Female	374	40.0
Most common symptoms		
Fever	935	100.00
Headache	813	86.95
Body ache	776	82.99
Nausea/vomiting	711	76.04
Rash	252	26.95
Bleeding	262	28.02
Anorexia	196	20.96

Demographic and Clinical Overview of the Study Subjects(n=935):The mean age of the participants was31.72±4.82years,ranging from 16 to 73 years.

Among the subjects,60%were male(n=561)and 40%were female(n=374).

Fever was the most common symptom, observed in 100% of cases. Other frequently reported symptoms included headache (86.95%),body ache (82.99%), nausea/vomiting (76.04%), and rash (26.95%). Notably, bleeding manifestations were present in 28.02%, while anorexia was reported in 20.96% of patients.

These findings indicate a typical dengue presentation with a predominance of systemic and gastrointestinal

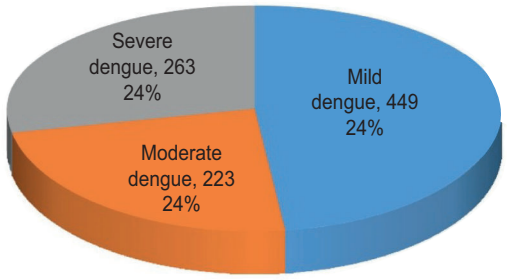

Figure I: *Severity of dengue(n=935)*

symptoms, along with a significant proportion exhibiting bleeding tendencies.

Figure shows out of the total 935 patients, the majority were diagnosed with mild dengue, accounting for 449 cases (48.0%). Moderate dengue was observed in 223 patients (23.8%), while severe dengue with bleeding manifestations was identified in 263 cases (28.1%).

Table II

Mean comparison between Dengue severity with Platelet Count (μL)

Dengue Severity	Number of Cases	Mean ±SD	Platelet Count Range (μL)
Mild Dengue	449	102800 ±5796	90,000-110,000
Moderate Dengue	223	76500 ±10750	55,000-98,000
Severe Dengue with Bleeding		263	
Day 5		9500 (±1200)	7,000-11,000
Day 6		68500 (±10250)	7,000-11,000
Day 8		82000 (±14000)	54,000-110,000

The analysis revealed a progressive decline in platelet count with increasing severity of dengue. Patients with mild dengue (n=449)had a relatively preserved mean platelet count of 102,800 ± 5,796/μL, ranging from 90,000 to 110,000/μL. In contrast, those with moderate dengue(=223)showed a marked reduction, with a mean of 76,500±10,750/μL and a range of 55,000 to 98,000/μL. Among the severe dengue cases with bleeding (n=263), platelet counts were critically low on day 5,averaging9,500±1,200/μL (range: 7,000-11,000/μL). However,a gradual improvement was noted over time, with counts rising to68,500±10,250/uL by day 6, and further to 82,000±14,000/μL by day 8 (range: 54,000-110,000/μL).

This pattern underscores the severity-dependent nature of thrombocytopenia in dengue, highlighting the critical need for close monitoring of platelet levels, especially in severe cases, to prevent complications and guide timely clinical interventions.

Table III

Estimated Daily Platelet Count Statistics in Severe Dengue Patients(n=263)

Day	Mean Platelet Count ($x10^3/\mu/L$) Mean (±SD)	Minimum ($x10^3/\mu/L$)	Maximum ($x10^3/\mu/L$)
Day 5	9.0±1.5	7.0	11.0
Day 6	12.0±3.0	6.0	18.0
Day 7	24.0±6.0	14.0	36.0
Day 8	58.0±10.0	48.0	89.0
Day 9	82.0±12.0	62.0	105.0
Day 10	96.0±13.0	72.0	110.0

The table summarizes the daily platelet count trends in 263 severe dengue patients. Platelet levels were lowest on Day 5 (meanand began to rise steadily thereafter. By Day 7, the mean count increased to ,and by Day 10, it reached96.0±13.0x103/uL. This upward trend indicates gradual recovery from thrombocytopenia.

Table IV

Comparison of Common Clinical Features in Mild,Moderate, and Severe Dengue(=935)

Feature	Mild Dengue (n=449)	Moderate Dengue (n=223)	Severe Dengue with Bleeding (n=263)
Day of Presentation	Day 2-3	Day 5	Day 5
Fever	449	223	263
Headache	382	196	234
Body Ache	368	187	224
Nausea/Vomiting	314	178	218
Rash (maculopapular)	00	71	126
Retro-orbital Pain	00	89	147
Bleeding Manifestations	00	00	13

Table V

Distribution of duration of hospital stay in deferent severity of dengue(=935)

Outcome	Mild Dengue (N = 449)	Moderate Dengue (n - 223)	Severe Dengue with Bleeding	p value
Hospital Stay	7.56(±2.91)	8.91(±2.37)	11.62(±3.69)	P<0.0001
Mortality	00	00	00	—

Purpuric Rash	00	00	239
Anorexia	81	49	66

In this cohort, mild dengue cases(n=449)typically presented on Day 2-3, whereas both moderate (n=223)and severe dengue cases(n=263)presented around Day 5. Fever was universally present, affecting 100% of patients across all severity groups. Headache was a frequent symptom, observed in 85.1% of mild, 87.9% of moderate, and 89.0% of severe cases. Similarly, body ache was reported in 81.9%, 83.8%, and 85.2% of patients with mild,moderate, and severe dengue, respectively. Nausea and vomiting were more prevalent in the higher severity groups,affecting 69.9% of mild, 79.8% of moderate, and 82.9% of severe cases. Maculopapular rash and retro-orbital pain were absent in mild dengue but were increasingly observed in moderate and severe cases-31.8% and 47.9% for rash, and 39.9% and 55.9% for retro-orbital pain, respectively. Bleeding manifestations occurred exclusively in 4.9% of severe cases (13 patients), which included gum bleeding, hematemesis, and per vaginal bleeding in 13female patients. A purpuric rash, considered a clinical hallmark of severe dengue, was found in 90.9% of severe cases (239 out of 263). Additionally, anorexia was reported in 18.0% of mild, 22.0% of moderate, and 25.1% of severe dengue cases.

The duration of hospital stay showed a significant difference across the varying severities of dengue among the study population(n=935)–'.Patients with mild dengue(n=449)had a mean hospital stay of7.56±2.91days,while those with moderate dengue (n=223)required a longer stay, averaging8.91±2.37 days. The longest hospitalizations were observed among patients with severe dengue with bleeding (n=263),with a mean duration of 11.62±3.69 days. This difference in hospital stay across the groups was statistically significant (p<0.0001), indicating a clear correlation between disease severity and length of inpatient care. Importantly, no mortality was recorded in any of the severity groups during the study period, reflecting effective clinical management and supportive care.

The management strategies varied according to the severity of dengue but yielded uniformly favorable outcomes. Patients with mild dengue(n=449)were treated with oral/IV fluids (2 liters/day),paracetamol for fever, andsupportive medications including antiemetics and antiulcer agents. All were discharged by Day 7 with full recovery. Those with moderate dengue(n=223)received more intensive care, including IV normal saline and Ringer lactate, IV or oral paracetamol, and additional supportive medications. These patients showed clinical improvement and were discharged on Day 8. Management of severe dengue with bleeding (n=263)involved aggressive fluid resuscitation, administration of IV dexamethasone with tapering, proton pump inhibitors (PPIs), and continuous clinical and laboratory monitoring. Despite the critical nature of their illness, all patients achieved full recovery and were discharged on Day e"10,,with no mortality observed across any of the groups. These outcomes highlight the effectiveness of prompt,stage-

Table VI

Management of different type of Dengue

		Management	Outcome
Mild Dengue	449	IV fluids (2L/day), paracetamol, antiemetics, antiulcer agents	Discharged on Day 7 with full recovery
Moderate Dengue	223	IV NS + Ringer Lactate, IV/oral paracetamol, supportive meds	Discharged on Day 8 with improvement
Severe Dengue with Bleeding	263	IV fluids, IV dexamethasone tapered, PPIs, monitoring	Full recovery; discharged on days;no mortality

specific management in preventing complications and ensuring recovery.

Discussion:

The current results serve to substantiate the well-established demographic and clinical characteristics of dengue epidemics in Bangladesh, as the mean age of patients in our cohort is approximately 31 years, and a preponderance of young adults is observed9.10. This age distribution is in accordance with previous epidemics, which demonstrated that the 15-40 age groups were disproportionately affected 11,12. The Mymensingh study, which found that the majority of patients were male and of lower educational status, predominantly from urban backgrounds, also demonstrated that young adults, particularly those residing in urban areas, remain the most vulnerable.13

In the present investigation, as in those of yore, a notable preponderance of the male sex hath been discerned 9,10ye tlo, recent examinations do unveil a slow but steady waning of this male dominance, whilst the cases of the fairer sex do ascend 14. These shifts in the populace may well mirror the changing tides of exposure, the ebb and flow of urban mobility, and the ever-evolving dance of transmission in the thrumming heart of populous realms.

Fever was consistent with the hallmark symptom of dengue, as identified in both local and global investigations 10,15. Clinically, fever was universally present. Parallel observations by Malavigeet al.16 and Martina et al.17underscore the systemic and gastrointestinal involvement that characterizes dengue infection, as do other commonly observed features-headache, body ache, nausea, vomiting, and rash. It is important to note that bleeding manifestations were observed in approximately one-fifth to one-quarter of patients 9,10. Severe cases exhibited purpuric dermatitis and overt hemorrhagic complications18. These clinical profiles are in accordance with prior epidemic reports from Bangladesh and neighboring regions by Rahman et al.'1 Alam et al.19

The heterogeneity of clinical outcomes is reflected in the spectrum of severity observed, which ranges from mild to severe dengue with hemorrhage. WHO classification criteria have been found to be beneficial in stratification.20 In the current outbreak, the percentage of severe dengue cases was 12-16% which is higher than the proportion reported in early outbreaks 11 but similar to recent national and regional reports 14,10. Evolutionary viral serotypes, secondary infections, and host immune responses may be responsible for this increase in severe forms.

Laboratory abnormalities including thrombocytopenia, leukopenia, hemoconcentration, and increased transaminases were extensively documented in the studies and are significant predictors of severity21,22.Tipo et al.18 highlight a severity-dependent reduction in platelet counts, underscoring the dynamic course of dengue disease, with lowest levels being found between Day 4 and Day 6,succeeded by a progressive recovery. Bleeding symptoms and hepatic impairment (SGPT>100 IU/L) were discovered as independent predictors of death in multivariate models, 18 supporting previous findings that emphasized the prognostic significance of these measures.21

Additionally, severity was reflected in hospitalization patterns, as moderate dengue necessitated shorter admissions than severe cases, which required an average of over 10 days.18 Due to the prompt provision of supportive care, mortality rates in certain cohorts were low, despite the severity of the illness18,19. In contrast, Khan et al.1° reported a mortality rate of 5.6%, which underscores the variability in outcomes that is contingent upon patient comorbidities, referral patterns, and the capacity of the health system.

Studies from Bangladesh and other endemic countries have documented the frequent but superfluous administration of antibiotics in dengue management, which remains a concern.14,23 This emphasizes the significance of preventing antibiotic misuse and strengthening clinical guidelines, particularly in viral infections like dengue.

Combined, the currentevidence confirms that young adults are the primary demographic affected by dengue in Bangladesh, with systemic, gastrointestinal, and hemorrhagic features being the most prevalent. Thrombocytopenia, hemoconcentration, and hepatic involvement are all closely correlated with severity.In cases with hemorrhage and significant hepatic dysfunction, mortality risk persists, but favorable outcomes are achieved through timely supportive management. Serotype-specific outcomes, gender shifts in susceptibility, and health system preparedness to manage the increasing burdens of severe dengue should be the primary focus of future research.

Conclusion:

Our study concluded that early diagnosis, careful monitoring of hematological and hepatic parameters, and prompt classification of disease severity are critical to effective clinical management. Supportive care remains the cornerstone of treatment; however, the use of corticosteroids in selected severe cases showed promising results in improving clinical outcomes

without adverse effects in our cohort. While no mortality wasrecorded, the presence of bleeding and elevated liver enzymes were strongly associated with disease severity and should be considered as key prognostic indicators.

Limitations:

The study was done in single center, so that the results may not reflect the exact picture of the country.The method of sampling was purposive. Small sample size was also a limitation of the study. Further multi-center studies with longer follow-up periods would provide more comprehensive insights.

Data Availability:

The datasets analysed during the current study are not publicly available due to the continuation of analyses but are available from the corresponding author on reasonable request.

Conflict of Interest:

There is no conflict of interest in this study.

Funding:

The research received no external funding.

Ethical consideration:

The study was approved by the Institutional Ethics Committee of Z.H. Sikder Women's Medical College & Hospital , Dhaka , Bangladesh Informed consent was obtained from each participant or relatives of the patients.

Author Contributions:

All authors made a significant contribution to the work reported, whether that is in the conception,study design, execution , acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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