Clinical profile of patients with dengue fever presenting to the emergency department of Gandaki Medical College: A cross-sectional study

Bijaya Gautam[1]*, Shanti Pokhrel[2], Laxman Banstola[3], Megh Nath Dahal[4]

[1]Department of Biochemistry, Gandaki Medical College Teaching Hospital and Research Center, Pokhara, Nepal, [2]Department of Emergency, Gandaki Medical College Teaching Hospital and Research Center, Pokhara, Nepal, [3]Department of Pathology, Pokhara Academy of Health Sciences, Pokhara, Nepal, [4]Department of Biochemistry, Manipal Medical College of Medical Sciences, Pokhara, Nepal

ABSTRACT

Introduction: Dengue fever is a self-limiting acute illness that occurs with dengue virus, whose vector is mosquitoes Aedes aegypti and Aedes albopictus. Dengue spread from person to person via infected mosquito, the primary vector being Aedes aegypti. Clinical features ranges from febrile phase to clinical phase and finally recovery phase. Warning signs of dengue fever are pain abdomen, persistent vomiting, fluid accumulation states like ascites or pleural effusion, bleeding from mucosa, lethargy, hepatomegaly greater than 2 cm, increase in hematocrit, including leukopenia and thrombocytopenia. Hence, this study aimed to evaluate clinical profile of dengue patients. **Methods:** This was a cross-sectional study where dengue fever was diagnosed based on serology (Ns1). The clinical parameters and laboratory findings were recorded after obtaining verbal and written consent. **Results:** Out of 170 dengue patients, mean age were 38.21(±16.5) years with a female:male ratio of 1.1:1. Majority had fever 164(96.5%) followed by headache 91(53.5%), retro-orbital pain 80(47.1%) and myalgia 112(65.9%). Most common feature of warning sign was abdominal pain 33(60%). Our study showed 91(53.5%) dengue patient had thrombocytopenia. This study showed the statistically significance between warning signs and thrombocytopenia($p<0.001$). **Conclusions:** Majority of dengue patients had fever, with abdominal pain as a common feature signifying warning sign. Majority had thrombocytopenia and leukopenia; this also showed statistically significant difference between thrombocytopenia and warning sign.

Keywords: Dengue fever, leukopenia, thrombocytopenia, warning signs.

***Correspondence:**
Dr. Bijaya Gautam
Department of Biochemistry
Gandaki Medical College Teaching Hospital and Research Center, Pokhara, Nepal
Email: gautmbj@gmail.com

Submitted: March 20,2026
Accepted: May 20, 2026

To cite: Gautam B, Pokhrel S, Banstola L, Dahal MN. Clinical profile of patients with dengue fever presenting to the emergency department of Gandaki Medical College: A cross-sectional study. JGMC-Nepal. 2026;19(1):73-8.

DOI: 10.3126/jgmc-n.v19i1.91917

INTRODUCTION

Dengue fever is a self-limiting acute illness due to the dengue virus, spread by the two major species of mosquitoe, Aedes aegypti and Aedes albopictus.[1] Dengue gets transmitted from person to person from this infected mosquito, the primary vector being Aedes aegypti, which is domestic day biter in nature, that breeds in water containers.[2] Estimated about half of the world's population is at risk of dengue, and the incidence of dengue has increased dramatically 430 to 5.2 million. There are mainly four serotypes of dengue virus - DEN1 to DEN4.[3] Dengue is an endemic in Nepal, Bagmati province being the second most densely populated province in the country, holds the highest no of cases.[4] In regards to our Gandaki Province, cases were none till the last few years, but 2679 cases were registered in 2019 alone, the majority of cases falls from the Kaski district.[5]

Dengue infection has wide range of manifestation, ranging from mild to severe hemorrhagic disease.[6] The usual presentation of dengue fever may be asymptomatic, can be typical or severe dengue fever that

is characterized by microvascular permeability, frequently seen with infection by other dengue virus serotype and altered patient's immune response.[7,8] Most cases of dengue are symptomatic or mild.[3] Clinical features of dengue fever may have febrile phase that proceeds to clinical phase eventually recovery phase or may get worsen with severe dengue, dengue shock syndrome.[9-11] Warning signs present in dengue fever are pain abdomen, persistent vomiting, states of fluid accumulation like ascites or pleural effusion, bleeding from mucosa, lethargy, hepatomegaly (usually greater than 2 cm), rise in hematocrit, and thrombocytopenia.[9] The virus is usually detected by testing for a virus protein named NS, and takes only 20 minutes to determine the result. IgM antibodies can be detected 1 week after infection and remains detectable for around 3 months.[12] Dengue fever diagnosis is based on clinical, epidemiological and laboratory variables. Among laboratory inputs, both specific tests (tests for viral isolation and serology for antibody) and non-specific tests [total count, differential count, platelet count, tourniquet test, liver function tests, prothrombin time (PT) and activated partial thromboplastin time (APTT) are used.[13] In hematological variations, leukopenia is the most prominent, even some reports reflected mild leukocytosis at the beginning of the disease, with neutrophilia predominantly. Frequently Lymphocytosis with atypical lymphocytes is seen. The hematocrit concentration is assessed according to the days of illness, commonly with the progression, 20% increase in hematocrit from the baseline is seen, and is also associated with thrombocytopenia ($<100x10^9$/L).[14] Thrombocytopenia, a common clinical manifestation in dengue, results from mechanisms involved in bleeding manifestation and thrombocytopenia during infections, has direct or indirect affect in bone marrow progenitor cells.[15] There may be abrupt drop in the platelet count, but usually it follows its own clinical course and management is conservative.[16] Severe form of dengue infection is a dengue hemorrhagic fever having significant morbidity and mortality. Morbidity and mortality associated with it which can be reduced by early identification of severe dengue infections.[17] Antipyretics and pain relievers can be used to treat dengue fever asymptomatically. Severe illness may require hospitalization as well as plenty hydration. The febrile phase is characterized by a high fever, myalgia, headache, vomiting, body soreness, joint pain, temporary rash, and bleeding symptoms like petechiae, ecchymosis around pressure sites as well as venipuncture bleeding.[18]

Much of studies on dengue have demonstrated hematological changes in such patients. The most reported changes are thrombocytopenia in 40%–79% of cases, leucopenia in 30%–69% of cases.[19,20] Recent data suggest platelet-associated immunoglobulins involving anti-dengue virus activity play a pivotal role in the development of dengue hemorrhagic fever (DHF), as well as thrombocytopenia in secondary dengue virus infections.[21] This study evaluated clinical profile and laboratory parameters of dengue patients, early recognition of clinical manifestations and warning signs is essential to reduce further complications.

METHODS

A cross-sectional study was conducted on patients with dengue who attended to the Emergency Department, Gandaki Medical College, Nepal from August 2025 to January 2026. Diagnosis of dengue fever was done with serology (Ns1) test and clinical features. Then, we looked patient clinical features, warning signs and laboratory parameters. Warning signs was categorized according to WHO 2025 classification. We further categorized the thrombocytopenia into mild, moderate and severe grade where mild thrombocytopenia ranges from (100000-149999) per microlitre, moderate ranges from (50000-99999) per microlitre, Severe thrombocytopenia (<50000) per microlitre.[4] The ethical clearance was obtained from the institutional review committee, GMCTHRC (Ref. No. 91/081/082-F). A written informed consent was taken from all the participants before the data collection. A convenience sampling technique was applied to enroll the participants in the study. Based on Cochran's formula, previous study showed prevalence was 37.63%,[5] adding 10% for nonresponse, a sample size 170 was calculated. The data obtained from each sample was recorded in the proforma sheet and the data was entered into Microsoft Excel sheet and then transferred into Statistical Package for Social Science (SPSS) version 11.5. The analysis of the data was done in SPSS. Descriptive statistics was completed with frequency, percentage, mean, standard deviation. For graphical representation pie chart was constructed. Chi-square was applied to find out association between two categorical variables. Probability of significance was set $p<0.05$.

RESULTS

A total of 170 dengue patients were included in the study. The patient's mean age (±SD) was 38.21(±16.5) years with a female:male ratio of 1.1:1. Majority were from Kaski district 123(72.4%). (Table 1)

Table 1: Sociodemographic characteristics of the patient with dengue (N=170)

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	81	47.6
	Female	89	52.4
Age	<20	22	12.94
	21-30	50	29.41
	31-40	34	20
	41-50	25	14.7
	51-60	12	7.1
	61-70	23	13.5
	71-80	3	1.8
	>80	1	0.6
District	Syangja	7	4.1
	Tanahun	21	12.4
	Parbat	12	7.1
	Kaski	123	72.4
	Baglung	6	3.5
	Myagdi	1	0.6

The major clinical symptoms of the patients were fever 164(96.5%), followed by myalgia 112(65.9%) and headache 91(53.5%). The least common symptoms were nausea 33(19.4%) followed by rash13(7.6%). (Table 2)

Table 2: Clinical symptoms of patient with dengue (N=170)

Symptoms	Frequency	Percentage (%)
Fever	164	96.5
Headache	91	53.5
Retroorbital pain	80	47.1
Myalgia	112	65.9
Nausea	33	19.4
Vomiting	52	30.6
Lymphadenopathy	0	0
Rash	13	7.6

Table 3 shows laboratory parameters of the patients with dengue. In which 79(46.5%) dengue patients were having normal platelet count where, 29(17.1%) had mild thrombocytopenia, 29(17.1%) had moderate and 33(19.4%) had severe thrombocytopenia. Majority of patients had leukopenia 109(64.1), only 10(5.9%) had IgM positive.

Table 3: Laboratory parameters of the patients with dengue (N=170)

Characteristics	Category	Frequency
Thrombocytopenia	Yes	91
	No	79
Severity of Platelets	Normal (150,000- 450,000) per microliter	79
	Mild thrombocytopenia (100000-149999) per microliter	29
	Moderate thrombocytopenia (50000-99999) per microliter	29
	Severe thrombocytopenia (<50000) per microliter	33
Leukopenia	Yes (<4000)per microliter	109
	No (>4000) per microliter	61
IgM antibody	Presence	10
	Absence	160
IgG antibody	Presence	6
	Absence	164
NS1 Antigen	Presence	170
	Absence	0

Among the total patients, 55 presented with warning signs of dengue. (Figure 1) Among them, majority had abdominal pain 33(60%), followed by persistent vomiting 23(41.8 %), fluid accumulation 18(32.7%), mucosal bleed 10(18.2%). (Table 4)

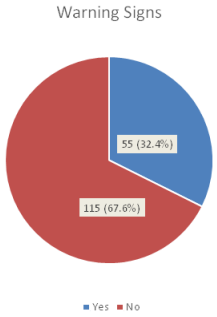

Figure 1: Presence of warning signs of Dengue (N=170)

Table 4: Warning signs of patient presented with dengue (n=55)

Warning Signs	Categories	Frequency	Percentage (%)
	Abdominal Pain	33	60
	Persistent vomiting	23	41.8
	Fluid accumulation	18	32.7
	Mucosal bleed	10	18.2
	Lethargy or restlessness	12	21.8
	Liver Enlargement	1	1.8
	Hematocrit	0	0

There was statistically significant association between hematological parameters and presence of warning signs of dengue ($p<0.05$). (Table 5)

Table 5: Association between Hematological parameters and presence of Warning Signs of dengue

Variables	Categories	Warning signs		Chi-square value*	p-value
		Yes	No		
Platelets	Normal	2 (2.5%)	77(97.5%)	113.176	<0.001**
	Mild thrombocytopenia	3(10.3%)	26 (89.7%)		
	Moderate thrombocytopenia	18(62.1%)	11(37.9%)		
	Severe thrombocytopenia	32(97%)	1(3%)		
Leukopenia	Presence	45 (41.3%)	64(58.7%)	11.072	0.001
	Absence	10 (16.4%)	51 (83.6%)		
Thrombocytopenia	Presence	53 (%)	38(41.8%)	59.969	<0.001**
	Absence	2(2.2%)	77(97.5%)		

*Chi-square test; ** $p<0.05$ denotes statistical significance

DISCUSSION

Multidisciplinary team approach is essential for identification and management of dengue fever that should include laboratory person, infectious expert and emergency physician.[22] Early treatment comprises of fluid repletion, fever management with paracetamol and blood transfusion in case of hemorrhage. Confirmation of diagnosis is through clinical assessment and antigen detection test.[5] There is huge challenge in early recognition of the warning signs of

dengue fever. An early screening for warning signs by taking the clinical profile of patients can help to prevent the complications related with dengue fever.[23] Clinicians should consider such patients evaluation and if necessary, manage for complications.

The present study included 89 females and 81males diagnosed with dengue fever. The female to male ratio was 1.1:1. The present study predominantly affects a young population, with a mean age of 38.21 years, and shows a slight female predominance, this might be due to outdoor exposure to mosquito for household chores which is comparable with other study done by Dibhya et al.[24] Most of the patients were from Kaski district ward 17 as the hospital lies at the central area of Kaski district.

Clinically fever was a common symptom, followed by myalgia headache, retro orbital pain and vomiting, which is similar to other studies.[5,23] In our study rash was present in few patients when studies from Sri Lanka and Thailand have documented higher rates of rash and gastrointestinal manifestations,[25] possibly attributable to differences in circulating viral serotypes.

One of the four distinct dengue virus serotypes (DEN1, DEN2, DEN3 and DEN4) of the genus flavivirus causes dengue fever.[26] In our study we evaluate the patients Antigen where we sent Dengue serology (NS1, IgG and IgM). Our study showed only 10 people had IgM positive, prevalence of these antibodies in our study was less than that reported in other studies.[26,27] Early presentation in emergency might be reason for lesser IgM cases.

Identifying dengue hemorrhagic fever clinically is not easy at early phase; only by day 3 or 4 of illness, there is thrombocytopenia and rising hematocrit.[26] Our study showed 53.3% of patients had decrease level of platelet counts which was categorized later as disease severity, 19.4% of dengue patients had severe thrombocytopenia,17.1% of patients had mild to moderated thrombocytopenia. Prevalence of thrombocytopenia is lower than other studies where ranges from 59% to 83%.[26,27] This study was done in emergency department which might justify the low prevalence of thrombocytopenia. Dengue has been one of the most common infectious diseases that can cause bi-cytopenia, two third of dengue patients had leucopenia, in current study that correlate with the study of Singh et al., also observed similar low white blood cell counts.[28] This research also indicates that virus-induced destruction or suppression of myeloid progenitor cells may result in leucopenia in dengue fever.

In our study 55 dengue fever patient had warning signs where abdominal pain was common (60%) followed by persistent vomiting (41.85%), fluid accumulation (32.75%), lethargy (21.8%), mucosal bleed (18.2%) and liver enlargement (1.8%). The categorization warning signs of dengue fever is based on 2022 WHO guideline.

Several studies have shown a significance association between dengue fever severity and thrombocytopenia severity,[29] our study also shows the association between severity of thrombocytopenia and severity of warning signs where p value <0.001. Despite of advancement in diagnostic tool; leucopenia and thrombocytopenia remain a probable predictor of disease progression.[20]

CONCLUSIONS

The present study hints general physician to screen warning signs of dengue fever and assess the laboratory parameters. Early identification of warning signs, thrombocytopenia and leucopenia may help to reduce further complication by treating earlier. In dengue fever patient leucopenia and thrombocytopenia can be detected early in the Emergency Department where leukopenia and thrombocytopenia possibly indicate progression in the severity of disease. Our study showed majority of dengue patient had fever where abdominal pain was common feature of warning sign. Majority had thrombocytopenia and leukopenia, also shows statistically significant between thrombocytopenia and warning sign. Early detection of leukopenia and thrombocytopenia in the febrile phase can help clinicians to prevent further complications.

ACKNOWLEDGEMENTS

We are privileged to have this opportunity to express our sincere gratitude to all the people and participants involved in this study without whom, completion of this research work wouldn't have been possible.

CONFLICTS OF INTEREST: None declared

SOURCE OF FUNDING: None

AUTHORS' CONTRIBUTIONS

BG & SP designed the research, collected data, performed statistical analysis, and prepared the first draft of the manuscript, all explained and interpreted the data and contributed to preparing the final draft of the manuscript. All authors read and approved the manuscript.

REFERENCES

1. Gomard Y, Lebon C, Mavingui P, Atyame CM. Contrasted

transmission efficiency of Zika virus strains by mosquito species Aedes aegypti, Aedes albopictus and Culex quinquefasciatus from Reunion Island. Parasit Vectors. 2020;13(1):398. DOI: 10.1186/s13071-020-04267-z PMID: 32762767.

2. Vijay J, Anuradha N, Anbalagan VP. Clinical Presentation and Platelet Profile of Dengue Fever: A Retrospective Study. Cureus. 2022;14(8):e28626. DOI:10.7759/cureus.28626 PMID: 36196330.
3. Waggoner JJ, Gresh L, Vargas MJ, Ballesteros G, Tellez Y, Soda KJ, et al. Viremia and Clinical Presentation in Nicaraguan Patients Infected with Zika Virus, Chikungunya Virus, and Dengue Virus. Clin Infect Dis. 2016;63(12):1584-90. DOI: 10.1093/cid/ciw589 PMID: 27578819.
4. World Health Organization (10 October 2022). Disease Outbreak News; Dengue fever - Nepal. Available at: https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON4125
5. Dhungana D, Banstola B, Banjara M. Clinical and haematological profile of dengue among adult patients at a tertiary care hospital in Pokhara. medRxiv. 2022:2022-04. DOI: 10.1101/2022.04.19.22274055
6. Wang WH, Urbina AN, Chang MR, Assavalapsakul W, Lu PL, Chen YH, Wang SF. Dengue hemorrhagic fever - A systemic literature review of current perspectives on pathogenesis, prevention and control. J Microbiol Immunol Infect. 2020;53(6):963-78. DOI: 10.1016/j.jmii.2020.03.007
7. Baak-Baak CM, Cigarroa-Toledo N, Pech-May A, Cruz-Escalona GA, Cetina-Trejo RC, Tzuc-Dzul JC et al. Entomological and virological surveillance for dengue virus in churches in Merida, Mexico. Rev Inst Med Trop Sao Paulo. 2019;61:e9. DOI: 10.1590/S1678-9946201961009
8. Sharma M, Glasner DR, Watkins H, Puerta-Guardo H, Kassa Y, Egan MA, et al. Magnitude and Functionality of the NS1-Specific Antibody Response Elicited by a Live-Attenuated Tetravalent Dengue Vaccine Candidate. J Infect Dis. 2020;221(6):867-77. DOI: 10.1093/infdis/jiz081
9. Ng DH, Wong JG, Thein TL, Leo YS, Lye DC. The Significance of Prolonged and Saddleback Fever in Hospitalised Adult Dengue. PLoS One. 2016;11(12):e0167025. DOI: 10.1371/journal.pone.0167025PMID: 27936002.
10. Khalil MA, Tan J, Khalil MA, Awan S, Rangasami M. Predictors of hospital stay and mortality in dengue virus infection-experience from Aga Khan University Hospital Pakistan. BMC research notes. 2014;7(1):473. DOI: 10.1186/1756-0500-7-473
11. Whitehorn J, Farrar J. Dengue. British medical bulletin. 2010;95(1):161-73. DOI: 10.1093/bmb/ldq019
12. Burrell CJ, Howard CR, Murphy FA. Laboratory Diagnosis of Virus Diseases. Fenner and White's Medical Virology. 2017:135–54. DOI: 10.1016/B978-0-12-375156-0.00010-2
13. De Paula SO, Fonseca BA. Dengue: A review of the laboratory tests a clinician must know to achieve a correct diagnosis. Braz J Infect Dis.2004;8(6):390-8. DOI: 10.1590/s1413-86702004000600002
14. Kao CL, King CC, Chao DY, Wu HL, Chang GJ. Laboratory diagnosis of dengue virus infection: current and future perspectives in clinical diagnosis and public health. J Microbiol Immunol Infect. 2005;38(1):5-16. PMID: 15692621.
15. Murgue B, Cassar O, Guigon M, and Chungue E. Dengue virus inhibits human hematopoietic progenitor growth in vitro. The Journal of Infectious Diseases.1997;175(6):1497–501. DOI: 10.1086/516486
16. Das S, Abreu C, Harris M, Shrader J, Sarvepalli S. Severe thrombocytopenia associated with dengue fever: an evidence-based approach to management of thrombocytopenia. Case Rep Hematol. 2022;202(1):3358325. DOI: 10.1155/2022/3358325
17. Riaz M, Harun SN, Mallhi TH, Khan YH, Butt MH, Husain A, et al. Evaluation of clinical and laboratory characteristics of dengue viral infection and risk factors of dengue hemorrhagic fever: a multi-center retrospective analysis. BMC Infect Dis. (2024) 24:500 DOI:10.1186/s12879-024-09384-z
18. Arya SC, Agarwal N, Parikh SC, Agarwal S. Simultaneous detection of dengue NS1 antigen, IgM plus IgG and platelet enumeration during an outbreak. Sultan Qaboos Univ Med J. 2011;11(4):470-6. PMID: 22087395.
19. Aragão EPS, Oliveira OMNPF, Ferreira EC, de Arruda Souza T. Estudo das alter açõeshematológicas dos pacientes com diagnostic sorológico de dengue de um hospital privado em Santos – SP. Rev UNILUS Ensino e Pesquisa. 2013;9(16):10-7 PMID: 23049396.

20. Archuleta S, Chia PY, Wei Y, Syed-Omar SF, Low JG, Oh HM, et al. Predictors and clinical outcomes of poor platelet recovery in adult dengue with thrombocytopenia: a multicenter, prospective study. Clinical Infectious Diseases. 2020;71(2):383-9. DOI:10.1093/cid/ciz850

21. Oishi K, Saito M, Mapua CA, Natividad FF. Dengue illness: clinical features and pathogenesis. Journal of infection and chemotherapy. 2007;13(3):125-33. DOI: 10.1007/s10156-007-0516-9

22. Nujum ZT, Saritha N, Prathibha Raj MR, Gayathri AV, Nirmala C, Vijayakumar K, et al. Seroprevalence of dengue infection in pregnant women and placental antibody transfer. Med J Armed Forces India. 2019;75(1):90-5. DOI: 10.1016/j.mjafi.2018.08.009

23. Khan MA, Khan MM, Hameed A, Shaikh S, Rafeh M, Basit A, et al. Clinical Profile and Outcome of Dengue Fever in Patients Presenting to Emergency Department of Tertiary Care Hospital. Journal of Health, Wellness and Community Research. 2025;3(13):e792. DOI: 10.61919/stgrvh30

24. Dhivya P, Monica A, Jayaramachandran S. Clinical profile of Dengue fever in an urban tertiary care hospital in South India. Int J Adv Med. 2019;6(3):618-22. DOI: 10.18203/2349-3933.ijam20192086

25. Kularatne SA. Dengue fever. BMJ. 2015;351:h4661. DOI: 10.1136/bmj.h4661 PMID: 26374064.

26. Jayashree K, Manasa GC, Pallavi P, Manjunath GV. Evaluation of platelets as predictive parameters in dengue Fever. Indian J Hematol Blood Transfus. 2011;27(3):127-30. DOI: 10.1007/s12288-011-0075-1

27. Kumar M, Verma RK, Mishra B. Prevalence of Dengue Fever in Western Uttar Pradesh, India: A Gender-Based Study. Int J Appl Basic Med Res. 2020;10(1):8-11. DOI: 10.4103/ijabmr.IJABMR_337_18

28. Singh J, Dinkar A, Atam V, Himanshu D, Gupta KK, Usman K, et al. Awareness and outcome of changing trends in clinical profile of dengue fever: a retrospective analysis of dengue epidemic from January to December 2014 at a tertiary care hospital. J Assoc Physicians India. 2017;65(5):42-6. PMID: 28598047.

29. Padyana M, Karanth S, Vaidya S, Gopaldas JA. Clinical Profile and Outcome of Dengue Fever in Multidisciplinary Intensive Care Unit of a Tertiary Level Hospital in India. Indian J Crit Care Med. 2019;23(6):270-3. DOI: 10.5005/jp-journals-10071-23178 PMID: 31435145