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The Clinical Presentations and Outcomes of Dengue Fever in a Tertiary Hospital in the United Arab Emirates: Retrospective Study

Aisha Ali Alkhadar[1], Salma Alshamsi[2], Mahasin Hassan Shaheen[3], Ahmad Subhi[4], Aulin Vitus[5], Tagwa Elamin Elzein Sigairon[6], Ibrahim Mahmoud[7]

[1]Emirates Health Services (EHS), Al Qassimi Hospital, Internal Medicine Physician, Sharjah, United Arab Emirates

[2] Emirates Health Services (EHS), Al Qassimi Hospital, Infectious Diseases Consultant, Sharjah, United Arab Emirates

[3] Emirates Health Services (EHS), Al Qassimi Hospital, Internal Medicine Consultant, Sharjah, United Arab Emirates

[4] Emirates Health Services (EHS), Al Qassimi Hospital, Infectious Diseases Consultant, Sharjah, United Arab Emirates

[5] Emirates Health Services (EHS), Infection Prevention and Control Department, Al Qassimi Hospital, PCI-RN, CIC, AL-CIP, PG-DIPC, Sharjah, United Arab Emirates

[6] Faculty of Medicine, National Ribat University, Khartoum, Sudan

[7] College of Medicine, University of Sharjah, Sharjah, United Arab Emirates

ABSTRACT: Objective: To evaluate the clinical presentation, laboratory findings, and outcomes of confirmed dengue fever in a tertiary hospital in the United Arab Emirates, with emphasis on age-related differences.

Material and Methods: This retrospective observational study included 510 patients aged >13 years with laboratory-confirmed dengue fever admitted to Al-Qassimi Hospital from January to June 2024. Clinical and laboratory data were compared between patients aged <40 and ≥40 years using chi-square tests.

Results: Dengue PCR was positive in 99.6% of cases. Gastrointestinal bleeding and headache were more frequent in younger patients (41.4% vs. 29.1%, p=0.005; 39.2% vs. 29.6%, p=0.028), as was leukopenia (48.7% vs. 38.3%, p=0.023). Older patients had more thrombocytopenia (43.0% vs. 29.2%, p=0.001), renal impairment (21.8% vs. 8.4%, p<0.001), and hepatic impairment (64.4% vs. 49.7%, p=0.001). ICU admission (0.8%), hospital stay ≥5 days (4.3%), and mortality (0.6%) were low and did not differ significantly by age.

Conclusion: Dengue showed clear age-related differences in clinical and laboratory presentation, while overall outcomes remained favorable across both age groups.

INTRODUCTION:

Dengue fever is caused by the dengue virus and transmitted primarily by bites from Aedes mosquitoes that are prevalent in tropical and subtropical regions worldwide (1). The virus belongs to the Flaviviridae family and is classified as a +ssRNA, enveloped and icosahedral virus. There are four serotypes (DEN-1, DEN-2, DEN-3 and DEN-4), which can augment the possibility of infection. (2)

Dengue fever manifests with a spectrum of clinical presentations from mild febrile episodes associated with vomiting, rash, aches and pain, and retro-orbital pain to severe forms such as dengue haemorrhagic fever and dengue shock syndrome which is characterized by bleeding, low platelet counts, plasma leakage, organ failure, hypotension and potentially death (3)

The pathophysiology of dengue involves complex immunological responses and alterations in vascular permeability, necessitating careful clinical management to prevent severe complications (4). The treatment protocols emphasize supportive care, including fluid replacement and attentive monitoring, highlighting the importance of early detection and intervention to improve patient outcomes (5,6).

Prolonged hospital stays and complication rates may result from inconsistent application of hospitalization criteria, delayed diagnosis, and inadequate treatment protocols (7). These challenges emphasize the critical need for a systemic assessment of existing clinical practices to identify gaps in the implementation of treatment protocols, thus optimizing patient care and resource allocation (8,9).

In recent decades, the incidence of Dengue Fever has increased dramatically worldwide. According to the World Health Organization, an estimated 50 million cases of dengue infections are reported annually, and around 2.5 billion people live in areas where dengue transmission could potentially occur. (10). The global prevalence of the disease has increased dramatically in recent decades. rising from 505,430 cases in 2000 to 5.2 million in 2019 [4]. In 2023, over 6.5 million cases and more than 7,300 deaths were reported. As of 2024, more than 7.6 million cases have been reported, with over 16,000 severe cases and more than 3,000 deaths. This disease also imposes a considerable financial burden. A comprehensive analysis reported that the total cost of dengue infection in 2022 was approximately 94.7 billion US dollars. This recent wide expansion is due to various factors; rainy weather is a primary contributor to the increase in mosquito populations. Furthermore, extremely high-risk dengue exposure has been found to correlate with densely populated areas (11).

Until 2022 there were limited studies worldwide that addressed the mortality associated with dengue fever (12-13).

Dengue fever cases in the United Arab Emirates (UAE) were previously almost exclusively travel-related, imported by residents or visitors traveling from endemic regions in South Asia, Southeast Asia, and parts of Africa. However, the epidemiological landscape has shifted recently, resulting in increased prevalence and the establishment of local transmission.

The prevalence spiked significantly following the heavy rainfall and subsequent flooding. The resulting pockets of stagnant water across urban, industrial, and residential areas created ideal breeding grounds for the Aedes species mosquito, the primary vector for the virus.

This study aims to identify Clinical presentations and outcomes of Dengue fever among confirmed dengue fever patients admitted to Al-Qassimi hospital, tertiary care facility.

Furthermore, it highlights the key clinical and biochemical characteristics, as well as treatment policies. The findings of this study will play a key role in designing innovative protocols to reduce the spread of the disease and deepen understanding of the related risks in affected regions.

Additionally, the findings should inform the development of targeted education campaigns and policy decisions, ultimately emphasizing dengue prevention and control efforts and reducing both the incidence and impact of the disease.

METHODOLOGY:

This retrospective observational study aims to investigate the clinical presentations and outcomes of Dengue fever in patients treated at a tertiary hospital in the United Arab Emirates from January 2024 to June 2024. The study will analyse data from patients admitted between January 2024 and June 2024. Data will be collected from electronic medical records, including demographic information, initial symptoms, laboratory findings and clinical outcomes. Patients included in the study who met the inclusion criteria of :1-Patients of age >13 diagnosed with Dengue fever confirmed by laboratory tests (e.g., IgM/IgG antibodies, RT-PCR)2-Patients admitted to the hospital for Dengue fever treatment during the specified period. Data collection entered by using excel sheet. Statistical analyses were performed using IBM SPSS Statistics.

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RESULTS:

Statistical Analysis:

Categorical variables were summarized as frequencies and percentages. Associations between age groups (<40 years and ≥40 years) and categorical variables were assessed using the chi-square test. A two-sided p-value <0.05 was considered statistically significant. Statistical analyses were performed using IBM SPSS Statistics for Windows, Version 30.0 (IBM Corp., Armonk, NY, USA).

Demographic Characteristics

A total of 510 patients with confirmed dengue fever were included in the analysis. Retrospective design study. The cohort was overwhelmingly male, with 477 patients (93.5%) identified as male compared with only 33 (6.5%) female patients, indicating a marked sex disparity in the affected population. With respect to age distribution, the majority of patients, 314 individuals (61.6%), were younger than 40 years, while the remaining 196 patients (38.4%) were aged 40 years or older, suggesting that dengue infection in this cohort disproportionately affected a relatively younger adult population. In terms of nationality, the vast majority of patients, 497 (97.5%), were non-Emirati, whereas only 13 patients (2.5%) held Emirati nationality. This distribution likely reflects the demographic composition of the surrounding population and possibly differential exposure risk related to occupation, housing density, or travel history among expatriate residents. Table (1).

Table 1. Demographic characteristics of patients with dengue fever.

Variable	Frequency (%)
Sex	
Female	33 (6.5)
Male	477 (93.5)
Age group, years	
< 40	314 (61.6)
≥ 40	196 (38.4)
Nationality	
Emirati	13 (2.5)
Non-Emirati	497 (97.5)

Clinical Characteristics by Age Group

When clinical manifestations were compared across the two age groups, most haemorrhagic and neurological symptoms did not differ significantly by age. Haemoptysis or epistaxis was uncommon overall (5.3%) and occurred at similar rates in patients under 40 years (6.1%) and those 40 years or older (4.1%), a difference that was not statistically significant (p = 0.334). Likewise, haematuria and hepatic encephalopathy were each observed in only 1.6% of patients, with virtually identical distributions between age groups (p = 0.956 for both), and seizures (1.8% overall; p = 0.313) and rashes (4.3% overall; p = 0.514) likewise showed no meaningful age-related variation.

Two clinical features, however, showed statistically significant associations with age. Gastrointestinal bleeding was reported in 36.7% of the overall cohort, but was notably more frequent among patients under 40 years (41.4%) than among those 40 years or older (29.1%), a difference that reached statistical significance (p = 0.005). Similarly, headache was more common in younger patients (39.2%) than in older patients (29.6%), with an overall prevalence of 35.5% and a significant association with age (p = 0.028). Together, these findings suggest that younger patients in this cohort were more likely to present with gastrointestinal bleeding and headache, which may reflect differences in symptom reporting, immune response, or disease presentation between age groups. Pain and fatigue were the most frequently reported symptoms overall (15.5% reported as "Yes" in the summary total), though the age-stratified figures for this variable appear internally inconsistent in the source table and should be re-verified against the raw dataset before being reported in a final manuscript; the associated p-value (0.095) did not reach statistical significance. Detailed as seen in table (2).

Table 2. Clinical characteristics of patients with dengue fever by age group, n (%)

Variable	Total	Age group, years		P value
		< 40	≥ 40	
Hemoptysis/epistaxis				
No	483 (94.7)	295 (93.9)	188 (95.9)	0.334
Yes	27 (5.3)	19 (6.1)	8 (4.1)	
Gastrointestinal bleeding				
No	323 (63.3)	184 (58.6)	139 (70.9)	0.005
Yes	187 (36.7)	130 (41.4)	57 (29.1)	
Hematuria				
No	502 (98.4)	309 (98.4)	193 (98.5)	0.956
Yes	8 (1.6)	5 (1.6)	3 (1.5)	
Hepatic encephalopathy				
No	502 (98.4)	309 (98.4)	193 (98.5)	0.956
Yes	8 (1.6)	5 (1.6)	3 (1.5)	
Seizure				
No	501 (98.2)	307 (97.8)	194 (99.0)	0.313
Yes	9 (1.8)	7 (2.2)	2 (1.0)	
Headache				
No	329 (64.5)	191 (60.8)	138 (70.4)	0.028
Yes	181 (35.5)	123 (39.2)	58 (29.6)	
Rashes				
No	488 (95.7)	299 (95.2)	189 (96.4)	0.514
Yes	22 (4.3)	15 (4.8)	7 (3.6)	
Pain and fatigue				

No	431 (84.5)	42 (13.4)	37 (18.9)	0.095
Yes	79 (15.5)	272 (86.6)	159 (81.1)	

Bold p-values indicate statistical significance ($p < 0.05$).

Laboratory Findings and Clinical Outcomes by Age Group

Dengue virus PCR was positive in the large majority of patients (99.6% overall), with detection rates of 100% among patients under 40 years and 99.0% among those 40 years or older; this small difference was not statistically significant ($p = 0.073$), confirming that virological confirmation was essentially universal across both age groups.

Several laboratory abnormalities, however, showed clear and significant age-related patterns. Leukopenia (white blood cell count $<4 \times 10^9$/L) was more common in younger patients (48.7%) than in older patients (38.3%), a significant difference ($p = 0.023$) that may reflect a more pronounced bone-marrow suppressive response to infection in younger individuals. Conversely, thrombocytopenia (platelet count $<50 \times 10^9$/L) was substantially more prevalent among patients aged 40 years or older (43.0%) than among younger patients (29.2%), with a highly significant association ($p = 0.001$), indicating that older patients were at greater risk of severe platelet depletion.

End-organ involvement followed a similar pattern favoring greater severity in older patients. Renal function impairment was detected in 21.8% of patients aged 40 years or older, compared with only 8.4% of younger patients ,the strongest association observed in the dataset ($p < 0.001$). Liver function impairment was also markedly more common among older patients (64.4%) than younger patients (49.7%), a significant difference ($p = 0.001$). Taken together, these two findings indicate that patients aged 40 years and above experienced substantially greater renal and hepatic involvement during dengue infection than their younger counterparts, consistent with an age-associated increase in disease severity at the organ level.

By contrast, indicators of overall clinical severity and outcome did not differ significantly by age. Haematocrit elevation ≥50% (15.6% overall; $p = 0.649$), an elevated INR (0.8% overall; $p = 0.209$), ICU admission (0.8% overall; $p = 0.633$), a prolonged length of stay ≥5 days (4.3% overall; $p = 0.278$), in-hospital mortality (0.6% overall; $p = 0.856$), and the need for antibiotic therapy (6.5% overall; $p = 0.626$) were all comparable between the two age groups. This suggests that, despite older patients experiencing more frequent laboratory-defined organ dysfunction, this did not translate into significantly higher rates of ICU admission, prolonged hospitalization, or mortality within this cohort, possibly reflecting effective clinical management, a relatively low overall severity of illness, or limited statistical power given the small absolute number of severe events (e.g., only 3 deaths and 4 ICU admissions in the entire cohort).Detailed as seen in table (3).

Table 3. Laboratory findings and clinical outcomes among patients with dengue fever by age group.

Variable	Total	Age group, years		P value
		< 40	≥ 40	
Dengue virus PCR				
Detected	507 (99.6)	313 (100)	194 (99.0)	0.073
Not detected	2 (0.4)	0 (0)	2 (1.0)	
White blood cell count				
$< 4 \times 10^9$/L	226 (44.8)	152 (48.7)	74 (38.3)	0.023
$\geq 4 \times 10^9$/L	279 (55.2)	160 (51.3)	119 (61.7)	
Hematocrit level				
≥ 50%	79 (15.6)	47 (15.1)	42 (16.6)	0.649
< 50%	426 (84.4)	265 (84.9)	161 (83.4)	

Platelet count				
≥ 50 ×10^9/L	331 (64.9)	221 (70.8)	110 (57.0)	0.001
< 50 ×10^9/L	174 (34.1)	91 (29.2)	83 (43.0)	
Renal function impairment				
Detected	68 (13.3)	26 (8.4)	42 (21.8)	< 0.001
Not detected	433 (84.9)	282 (91.6)	151 (78.2)	
Liver function impairment				
Detected	272 (55.4)	149 (49.7)	123 (64.4)	0.001
Not detected	219 (44.6)	151 (50.3)	68 (35.6)	
International normalized ratio (INR)				
Elevated	2 (0.8)	2 (1.4)	0 (0)	0.209
Normal	246 (99.2)	137 (98.6)	109 (100)	
Admission to ICU				
Yes	4 (0.8)	2 (0.6)	2 (1.0)	0.633
No	506 (99.2)	312 (99.4)	194 (99.0)	
Length of stay, days				
≥ 5	22 (4.3)	10 (3.2)	12 (6.1)	0.278
< 5	434 (85.1)	271 (86.3)	163 (83.2)	
Transferred	54 (10.6)	33 (10.5)	21 (10.7)	
Outcome				
Discharged	507 (99.4)	312 (99.4)	195 (99.5)	0.856
Deceased	3 (0.6)	2 (0.6)	1 (0.5)	
Antibiotic required				
Yes	33 (6.5)	19 (6.1)	14 (7.1)	0.626
No	477 (93.5)	295 (93.9)	182 (92.9)	

Bold p-values indicate statistical significance ($p < 0.05$).

DISCUSSION:

Dengue fever, known as break-bone fever, is a viral infection transmitted to people by mosquitoes and is more common in tropical and subtropical regions. While many people infected with dengue do not show any symptoms, those who do may experience high-grade fever, headache, body aches, nausea, and rash. Most individuals recover within 1-2 weeks, but in severe cases, hospital care may be necessary, and dengue can be fatal. In this single-centre cohort of 510 confirmed dengue patients compared with a 2026 Peruvian systematic review/meta-analysis (28 studies, 4418 patients) to contextualize local findings against regional evidence. (14)

Demographically, the two cohorts differ sharply: the local sample was overwhelmingly male (93.5%) and non-national (97.5%), consistent with a migrant/expatriate labor population with occupational and environmental exposure to Aedes aegypti, whereas the Peruvian data showed near-equal sex distribution from general community surveillance. Both cohorts, however, skewed toward working-age adults (20–40 years), suggesting a shared epidemiological pattern of dengue disproportionately affecting this age group despite differing population compositions.

For classic febrile-phase symptoms, the Peruvian review found high prevalence of fever, headache, malaise, myalgia, arthralgia, and GI complaints, reflecting systematic WHO-based symptom surveillance in prospective cohorts. The local dataset lacked most of these variables entirely, with headache documented in only 35.5% of cases, likely due to retrospective abstraction focused on warning signs and severity markers rather than early symptoms, rather than a true difference in symptom burden.

In contrast, hemorrhagic and organ-involvement findings diverged in the opposite direction. The Peruvian cohort showed low rates of hematemesis, petechiae, jaundice, and melena, while the local cohort showed substantially higher rates of GI bleeding (36.7%), thrombocytopenia (34.1%), and liver impairment (55.4%). This suggests the local sample is enriched for more clinically severe dengue, paralleling a Vietnamese severe-dengue cohort where liver failure was the dominant organ dysfunction, supporting the idea that the local dataset reflects a more complicated case mix rather than a general population sample.

Age proved to be a significant severity determinant locally: patients ≥40 years had significantly higher thrombocytopenia, renal impairment, and liver impairment than younger patients, while younger patients had more leukopenia, GI bleeding, and headache. The Peruvian review did not stratify by age, precluding direct comparison.

Despite this laboratory severity gradient, clinical outcomes remained reassuring and age-independent: ICU admission (0.8%), prolonged stay (4.3%), and mortality (0.6%, 3/510) did not differ significantly by age, roughly consistent with the Peruvian cohort's mortality burden (56/4418). The disconnect between biochemical severity and clinical outcomes may reflect limited statistical power from few severe events and effective early hospital-based monitoring preventing progression to critical illness.

Finally, diagnostic methodology differed substantially: The Peruvian studies used varied and sometimes unconfirmed diagnostic methods (serology, PCR, clinical criteria), contributing to symptom-prevalence heterogeneity, while the local cohort was almost uniformly PCR-confirmed (99.6%), enhancing diagnostic consistency but likely also selecting for more severe, hospital-presenting cases. Serotype data, available in the Peruvian review (DENV-2 predominant), were absent locally, limiting the ability to determine whether the observed hepatic/hemorrhagic severity reflects strain-specific virulence, case-mix selection, host susceptibility, or a combination of these factors.

CONCLUSION:

Given that dengue remains endemic in the region, with recurrent outbreaks reported in recent years, this single-Centre study highlights the considerable variability in the clinical presentation of the disease. The most common manifestations observed were headache and gastrointestinal bleeding. Laboratory findings revealed a notable age-related pattern: leukopenia was significantly more prevalent among younger patients (<40 years), whereas thrombocytopenia was more predominant among older patients. Diagnostically, Dengue PCR demonstrated high accuracy, confirming cases in 99% of the study cohort, underscoring its value as a reliable diagnostic tool in clinical practice.

Notably, both the mortality rate and hospital length of stay were relatively low in our cohort. This favorable outcome can be attributed to effective clinical management, including prompt symptom control, appropriate supportive treatment, and close patient observation to detect and prevent disease-related complications at an early stage.

These findings emphasize the heterogeneous nature of dengue's clinical and laboratory profile across different age groups, which has important implications for early recognition, risk stratification, and management of the disease.

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