CLINICAL AND SUBCLINICAL CHARACTERISTICS OF THE PATIENTS WITH DENGUE HEMORRHAGIC FEVER THAI NGUYEN

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Objectives: Describe clinical and subclinical characteristics of patients with dengue hemorrhagic fever (DHF) in Thai Nguyen.

Subjects and methods: Retrospective study on 43 patients diagnosed with DHF according to the standard of the Ministry of Health in 2019.

Results: The most common age was 35 - ≤ 60, accounting for 25/43 (58.1%), the least common age was ≤ 16 years old (4.6%). The mean of age was 43.6 ± 16.5; Male (55.8%) was higher proportion than female (44.2%). Patients lived in 15/21 wards and 1/11 communes in Thai Nguyen city; 4/6 districts included Phu Binh, Vo Nhai, Dai Tu and Dong Hy. Patients had fever accounted for the highest rate of 100%, followed by bleeding 31/43 (72.1%), abdominal pain or tenderness10/43 (23.2%), vomiting 7/43 (16.3%), diarrhea (9.3%), pleural effusion and acites 4.6%. Patients with hematocrit 35 - 45% accounted for the highest proportion of 21/43 (48.8%); Next, hematocrit > 45% accounted for 20/43 (46.6%). Patients with low platelets 5 - < 50 accounted for the highest proportion of 22/43 (51.2%), followed by 20/43 (46.5%) of patients with platelets of 50 - < 150 G/L; No patient had platelets < 5 G/L. Patients with AST 40 - < 400 (U/L) accounted for the highest proportion of 35/43 (81.4%), 2/43 (4.6%) patients with AST ≥ 1000 (U/L). Patients with ALT 40 - < 400 (U/L) accounted for the highest proportion in the study 30/43 (69.8%), 1/43 (2.3%) patients had AST ≥ 1000 (U/L). 100% of patients in the study were cured and discharged from the hospital, with no deaths, of which: patients with DHF and DHF with warning signs accounted for the highest rate of 46.6%.

Keywords: *Dengue Hemorrhagic Fever (DHF). Clinical and subclinical characteristics.*

INTRODUCTION

DHF is an infectious disease caused by the dengue virus, transmitted from mosquitoes to humans. The disease can cause death due to shock, hemorrhage, and organ failure because there was no specific treatment. The lack of treatment drugs, unapproved vaccines for use in many countries around the world, and the failure to control disease vectors have caused disease incidence to increase significantly in recent decades[1,2]. The incidence of the disease has increased significantly around the world in recent decades and is endemic in more than 100 countries in the world. The America, Southeast Asia and the Western Pacific were most seriously affected, with Asia accounting for about 70% of the global disease burden[3]. In 2022, Viet Nam has recorded 325,604 cases of DHF, 122 cases dead. Compared to 2021, the number of infections and deaths both increased. Thai Nguyen is a province not located in the key dengue epidemic area in the country, however in recent years, the number of cases has increased. In 2022, the number of dengue cases admitted to Thai Nguyen National Hospital for treatment increased more than in previous years. Patients often arrived late, missed diagnoses, and were assigned to other specialties. There has been no research on the characteristics of DHF in this province. Therefore, we conducted research on this topic with the objective: Describe the clinical and subclinical characteristics of DHF patients without epidemiological factors outside the province treated at Thai Nguyen National Hospital in 2022.

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SUBJECTS AND METHOD

***Subjects*:**

43 patients diagnosed with DHF, did not travel out of the province within 3 - 15 days before symptom onset, treated at Thai Nguyen National Hospital from January 1, 2022 to December 31, 2022. Patients selected for the study must meet the mandatory standards of the Ministry of Health: have a positive serum test for NS1 antigen within the first 5 days of illness or a positive ELISA test for IgM antibodies from the 5th day onwards or positive PCR and grading according to the Ministry of Health's "Guidelines for diagnosis and treatment of dengue hemorrhagic fever" in 2019[4].

***Methods*:** Descriptive, retrospective study.

Sample size and sampling method: All patients meeting the study criteria were selected for analysis.

Methods of collecting and processing data: Data were collected from the patient's medical records and were managed and processed using SPSS Statistic 20 softwwere. The data were processed according to medical statistics methods.

RESULTS

During the 2022 dengue epidemic, we collected 43 DHF patients having diagnostic criteria, with the following characteristics:

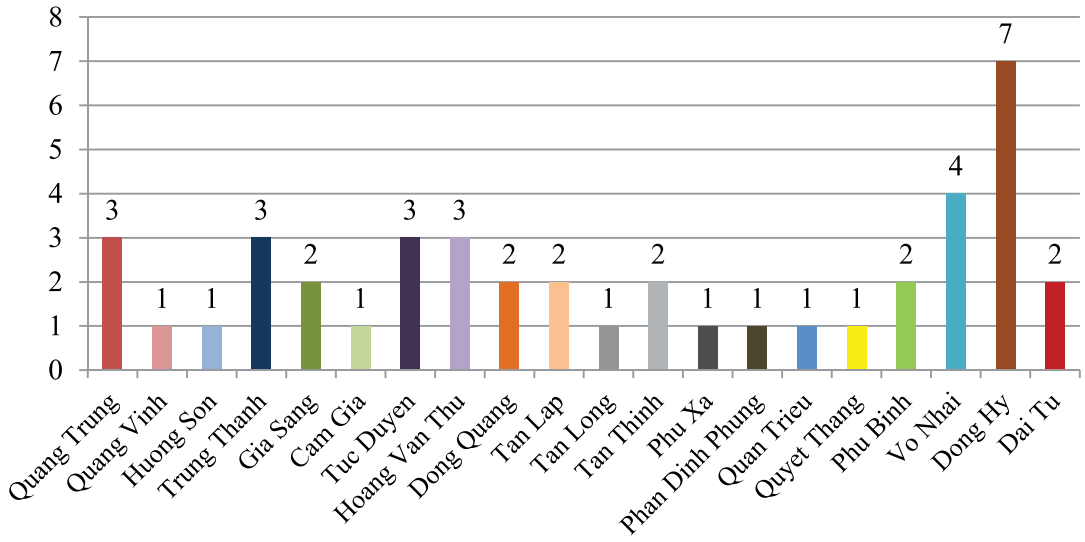

Figure 1. Distribution of patients by geography

In our study, dengue patients lived in 15/21 wards and 1/11 communes in Thai Nguyen city; 4/6 Districts include Phu Binh, Vo Nhai, Dai Tu and the highest rate was Dong Hy with 7/43 cases (16.3%).

Table 1. Distribution of patients according to common clinical symptoms

Clinical symptoms	Number of patients	Rate (%)
Fever	43	100
Hemorrhage	31	72.1
Vomit	7	16.3
Abdominal pain or tenderness	10	23.2
Diarrhea	4	9.3

Clinical symptoms	Number of patients	Rate (%)
Hepatomegaly	1	2.3
Pleural effusion and acites	2	4.6
Jaundice	1	2.3

Patients with symptoms of fever accounted for the highest rate of 100%, followed hemorrhage by 31/43 (72.1%), abdominal pain or tenderness 10/43 (23.2%), vomiting 7/ 43 (16.3%), diarrhea (9.3%), pleural effusion and acites 4.6%. The least common symptoms were hepatomegaly and jaundice (2.3%).

Table 2. Distribution of patients according tohematocrit and platelets

Index		Number of patients	Rate (%)
Hematocrit (%)	< 35	2	4.6
	35 - 45	21	48.8
	> 45	20	46.6
Platelets (G/L)	≥ 150	1	2.3
	50 - < 150	20	46.5
	5 - < 50	22	51.2
	< 5	0	0
Total		**43**	**100**

Patients with hematocrit of 35 - 45% accounted for the highest proportion of 21/43 (48.8%); Next, hematocrit > 45% accounted for 20/43 (46.6%), the lowest being 2/43 (4.6%) patients with hematocrit < 35%. The patient had the highest hematocrit of 53.3%. The mean value of hematocrit was 44.3 ± 5.3. Patients with platelets of 5 - < 50 accounted for the highest proportion of 22/43 (51.2%), followed by 20/43 (46.5%) of patients with platelets of 50 - < 150 G/L; No patient had platelets < 5 G/L. The patient has the lowest platelet index of 7 G/L. The mean value of platelet in the study was 53 ± 40.6 G/L..

Table 3. Distribution of patients according to AST

Index		Number of patients	Rate (%)
AST (U/L)	< 40	6	14.0
	40 - < 400	35	81.4
	400 - < 1000	0	0
	≥ 1000	2	4.6
ALT (U/L)	< 40	11	25.6
	40 - < 400	30	69.8
	400 - < 1000	1	2.3
	≥ 1000	1	2.3
Total		43	100

In our study, patients with AST 40 - < 400 (U/L) accounted for the highest proportion 35/43 (81.4%), only 6/43 (14%) patients had AST < 40. (U/L), 2/43 (4.6%) patients had AST ≥ 1000 (U/L). The patient had the highest AST of 1769 (U/L). Patients with ALT 40 - < 400 (U/L) accounted for the highest proportion 30/43 (69.8%), 11/43 (25.6%) patients had AST < 40 (U/L), 1/43 (2.3%) patients had AST ≥ 1000 (U/L). The patient had the highest ALT of 4039 (U/L).

Regarding treatment results, 100% of patients in the study were cured and discharged from the hospital, with no deaths, including:

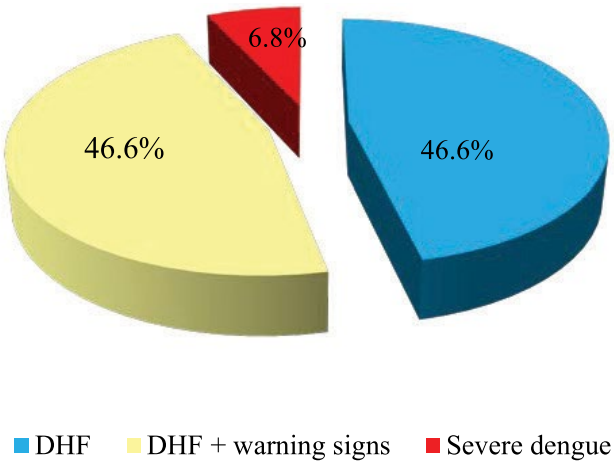

Figure 2. Distribution of patients according to dengue case classification

Patients with DHF and DHF with warning signs were the highest rate in our study and the rate was equal at 46.6%. There were 3 cases of severe dengue accounting for 6.8%.

DISCUSSIONS

In our study, dengue patients lived in 15/21 wards and 1/11 communes in Thai Nguyen city; 4/6 districts included Phu Binh, Vo Nhai, Dai Tu and the highest rate was Dong Hy with 7/43 cases (16.3%). This result showed that most of the province has DHF cases. So that, we recommend that medical staff in the province should think about and screen for DHF patients with acute fever, helping to detect the disease early and avoid the disease from progressing seriously. People who have symptoms of fever should also go to the doctor to screen for DHF. We agree with Nguyen Tien Thang's research during the dengue epidemic from January 2018 to 2019, on 197 patients treated at Bach Mai Hospital, Hanoi. The results showed that most patients had relatively low knowledge and practice of dengue prevention and recommended: "Communication programs to raise awareness about dengue fever should be repeated year-round and aimed at specific target groups are teenagers, the elderly, innkeepers and immigrants from other provinces to improve their knowledge and encourage them to take dengue prevention measures"[5]. Communication to help people in the province understand the importance of preventing, recognizing symptoms and treating dengue is very necessary.

Patients with symptoms of fever accounted for the highest rate of 100%, followed hemorrhage by 31/43 (72.1%), abdominal pain or tenderness 10/43 (23.2%), vomiting 7/ 43 (16.3%), diarrhea (9.3%), pleural effusion and acites 4.6%. The least common symptoms were hepatomegaly and jaundice (2.3%). These clinical symptoms are also consistent with the diagnostic guidelines of the World Health Organization, the Ministry of Health, and other documents on DHF. In particular, we pay special attention and analyze the symptoms to help warn of the risk of severe progression of the disease[4,6]. Meta-analysis of 13,090 articles by Tsheten Tsheten, symptoms of abdominal pain, hepatomegaly, melena, abdominal and pleural effusion are the warning signs of DHF. The Sorawat Sangkaew study also showed that vomiting, abdominal pain, and mucosal bleeding are signs of prognosis for severe dengue[7,8].

Patients with hematocrit of 35 - 45% accounted for the highest proportion of 21/43 (48.8%); Next, hematocrit > 45% accounted for 20/43 (46.6%), the lowest being 2/43 (4.6%) patients with hematocrit < 35%. The patient had the highest hematocrit of 53.3%. The mean value of hematocrit was 44.3 ± 5.3. Patients with platelets of 5 - < 50 accounted for the highest proportion of 22/43 (51.2%), followed by 20/43 (46.5%) of patients with platelets of 50 - < 150 G/L; No patient had platelets < 5 G/L. The patient has the lowest platelet index of 7 G/L. The mean value of platelet in the study was 53 ± 40.6 G/L. The results of the average value of the lowest decrease in platelet index and highest increase in hematocrit according to the day of illness in our study are similar to the results of Deborah HL Ng. In this study, we also found that, even when clinical symptoms were no longer severe, hematocrit tended to gradually decrease, and platelets in DHF continued to decrease from days 7 to 9. Meta-analysis 13090 articles by Tsheten Tsheten, two warning signs are thrombocytopenia and increased hematocrit which are two risk factors for severe dengue[8,9]. We recommend that you continue to monitor hematocrit and platelet index until day 10 of the disease.

Patients with AST index 40 - < 400 (U/L) accounted for the highest proportion in the study, 35/43 (81.4%), only 6/43 (14%) patients had AST index < 40 (U/L), 2/43 (4.6%) patients had AST ≥ 1000 (U/L). The patient had the highest increased AST index of 1769 (U/L). Patients with ALT index 40 - < 400 (U/L) accounted for the highest proportion in the study 30/43 (69.8%), 11/43 (25.6%) patients had AST index < 40 (U/L), 1/43 (2.3%) patients had AST ≥ 1000 (U/L). The patient had the highest ALT index increase of 4039 (U/L). In our study, the two patients with severe liver damage had no chronic disease, no history of liver disease, no history of drug use or alcohol abuse before or during the illness, and no treatment. Before entering the hospital and entering the hospital at a fairly early stage of the disease, liver enzymes also gradually increased in the first 5 days of the disease. The increase in AST and ALT values in our study is quite large and is different from the study by Deborah HL Ng. Research by Deborah HL Ng, the patient with the highest increase in AST was 943, the highest increase in ALT was 595[9]. Sorawat Sangkaew research shows that increased liver enzymes in the first 4 days of the disease are a risk factor for progression to severe dengue[7].

Patients with DHF and DHF with warning signs accounted for the highest proportion in the study and were equal at 46.6%. There were 3 cases of severe dengue fever, accounting for 6.8%. Although in 2022, the dengue epidemic in many provinces of Vietnam has a sudden increase in deaths, there has been no case of dengue death at our facility. Partly, because the province has a small number of cases compared to the whole country, the rate of people infected with the secondary dengue virus is still low, so the rate of severe complications is not high. But if departments, doctors, and people do not take timely measures to prevent and detect dengue fever early, the risk of outbreaks in the province and the number of secondary dengue virus infections in the coming years will increase. Secondary dengue infection is a risk factor for progression to severe dengue and death if not promptly diagnosed and treated.

CONCLUSIONS

Among 43 patients diagnosed with dengue without epidemiological factors outside the province, treated at Thai Nguyen Central Hospital in 2022, we draw the following conclusions:

- Patients live in 15/21 wards and 01/11 communes in Thai Nguyen city area; 4/6 districts include Phu Binh, Vo Nhai, Dai Tu and Dong Hy.

- Patients with symptoms of fever accounted for the highest rate of 100%, followed by bleeding 31/43 (72.1%), abdominal pain in the liver area or pain in the liver area 10/43 (23.2%), vomiting 7/43

(16.3%), diarrhea (9.3%), pleural and abdominal effusion 4.6%.

- Patients with hematocrit index 35 - 45% account for the highest rate of 21/43 (48.8%); Next, hematocrit > 45% accounted for 20/43 (46.6%).

- Patients with a reduced platelet index of 5 - < 50 accounted for the highest proportion, 22/43 (51.2%), followed by 20/43 (46.5%) of patients with a reduced platelet index of 50 - < 150 G/L; No patient had platelets < 5 G/L.

- Patients with AST index 40 - < 400 (U/L) accounted for the highest proportion in the study: 35/43 (81.4%), 2/43 (4.6%) patients had AST ≥ 1000 (U/L). Patients with ALT index 40 - < 400 (U/L) accounted for the highest proportion in the study, 30/43 (69.8%), 1/43 (2.3%) patients had AST ≥ 1000 (U/L)/l).

- 100% of patients in the study were cured and discharged from the hospital, with no deaths, of which: patients with DHF and DHF with warning signs accounted for the highest rate of 46.6%. There were 3 cases of severe dengue fever, accounting for 6.8%.

RECOMMENDATION

Clinicians in Thai Nguyen province, Vietnam need to consider dengue fever and screen patients with acute fever symptoms, even if the patient did not travel out of the province before the illness. People living in the province, when they have a fever, need to immediately go to medical facilities to be screened for DHF.

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