



## Case Report: Dengue Hemorrhagic Fever

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**Abstract.** *Dengue haemorrhagic fever (DHF) is an infectious disease caused by dengue virus with clinical manifestations of fever, muscle and/or joint pain accompanied by leukopenia, rash, lymphadenopathy, thrombocytopenia and hemorrhagic diathesis. In DHF, plasma permeation is characterized by hemoconcentration (increased hematocrit) or fluid accumulation in body cavities. A case report of a 28-year-old patient came to Dr. Suhatman Hospital, MARS with complaints of continuous fever, accompanied by headache and retro orbital pain and pain in the joints. On physical examination, blood pressure was 130/90 mmHg, temperature 38.5° degree C, flushing (+), tourniquet (+), blood test was obtained. In the supporting examination, routine blood laboratory results obtained thrombocytopenia and leukocytopenia.*

**Keywords :** *Dengue hemorrhagic fever, thrombocytopenia, leukocytopenia.*

### 1. INTRODUCTION

Dengue hemorrhagic fever (DHF) or Dengue haemorrhagic fever (DHF) is an infectious disease caused by the dengue virus with clinical manifestations of fever, muscle pain and/or joint pain accompanied by leukopenia, rash, lymphadenopathy, thrombocytopenia and hemorrhagic diathesis. (World Health Organization, 2024). In dengue fever, plasma seepage occurs which is characterized by hemoconcentration (increased hematocrit) or accumulation of fluid in the body cavity. Dengue hemorrhagic fever (DHF) is spread across Southeast Asia, the western Pacific and the Caribbean. Indonesia is an endemic area with distribution throughout the country. (Mandell, G.L., Bennett, J.E., & Dolin, R. 2015). The incidence of dengue fever in Indonesia was between 6 and 15 per 100,000 population (1989 to 1995) and increased sharply during extraordinary events to 35 per 100,000 population in 1998), while dengue mortality tended to decline to reach 2% in 1991. (Gubler, DJ 1998).

Transmission of dengue virus infection occurs through the mosquito vector of the *Aedes* genus (especially *A.aegypti* and *A. albopictus*). (Centers for Disease Control and Prevention, 2023). The increase in cases every year is related to environmental sanitation with the availability of breeding places for female mosquitoes, namely vessels containing clear water (bathtubs, used cans and other water reservoirs). (World Health Organization. 2024)

## 2. LITERATURE REVIEW

Dengue hemorrhagic fever is caused by the dengue virus which has four serotypes: dengue 1, dengue 2, dengue 3 and dengue 4. Primary infection usually results in a milder disease, while more severe disease occurs in cases of repeated infection with a different serotype. The clinical presentation of dengue virus infection ranges from asymptomatic to severe disease that can cause death if not treated properly. Symptomatic cases are categorized as undifferentiated fever (UF), dengue fever (DF), dengue hemorrhagic fever (DBD), dengue shock syndrome (DSS), and unusual dengue fever (UD). expanded dengue syndrome (EDS). UF cannot be diagnosed clinically and diagnosis is based on serology or virology. DF is considered a mild disease because deaths are rarely reported, but massive bleeding can be associated with DF. DHF has a clinical presentation during the febrile phase similar to DHF. The characteristic feature of DHF is increased blood vessel permeability (plasma leakage) which differentiates DHF from DHF. Plasma leak is a selective leak into the pleural cavity and peritoneum resulting in pleural effusion and ascites. DSS has the same presentation as DHF but the plasma leak is so severe that the patient goes into shock. In UD, most of the unusual cases are DHF cases with prolonged shock or DHF inpatients with comorbidities or DHF together with other infections. The majority of cases are UF and DF. DHF/DSS accounts for approximately 10% of symptomatic cases. ( Kalayanarooj, S. 2011).

Skrining yang dapat membantu diagnosis klinis awal infeksi dengue yaitu dengan tes tourniquet (TT) positif dan leukopenia ( $WBC \leq 5.000 \text{ sel/u.mm}$ ). Studi mengungkapkan bahwa TT positif atau leukopenia adalah dua tes yang memiliki sensitivitas tinggi sekitar 90% untuk diagnosis pasien demam berdarah, tetapi spesifisitas dan nilai prediktif positif (PPV) hanya masing-masing hanya 50-60% dan 60-70%. Jika kedua tes tersebut digabungkan, sensitivitasnya berkurang menjadi 74%.

While specificity and PPV increased to 85% and 83%, respectively. For early detection, effective and rapid control of dengue fever outbreaks, TT or leukopenia are good indicators to initiate immediate control measures. A positive TT with leukopenia is also a good indicator for immediate control action, 83% of these immediate control measures will be required, but approximately 26% of dengue cases that do not have a positive TT with leukopenia will be missed. ( Kalayanarooj S, et all, 1999)

Menurut WHO 2011, infeksi dengue dicurigai pada pasien yang mengalami demam tinggi dan dua dari tanda atau gejala berikut: sakit kepala, nyeri retro-orbital, mialgia, artralgia / nyeri tulang, ruam, manifestasi perdarahan (petekie, epistaksis, perdarahan gusi, hematemesis, melena, atau tes tourniquet positif), leukopenia ( $WBC \leq 5.000 \text{ sel/mm}^3$ ), jumlah trombosit  $\leq 150.000 \text{ sel/mm}^3$ , Hematokrit (Hct) meningkat 5-10% [15].

WHO/SEARO 2011 divides the DHF criteria as follows:

1. Kriteria mayor: kebocoran plasma: peningkatan Hct  $\geq$  20%, deteksi asites, efusi pleura dengan pemeriksaan fisik, foto dada (posisi dekubitus lateral kanan) atau ultrasonografi,
2. Kriteria minor: Perdarahan atau tes tourniquet positif, jumlah trombosit  $\leq$  100.000 sel/mm<sup>3</sup>.

Patients who have evidence of plasma leakage do not necessarily have bleeding or a positive tourniquet test and their platelet count can be around 100,000 cells/mm<sup>3</sup>.

The severity of dengue fever is divided into four classes according to its severity: grade I and grade II dengue fever are called DHF, while grade III and grade IV dengue fever are called DSS. ( Kalayanarooj, S. 2011).

Dengue infection is a dynamic systemic disease and has a wide clinical spectrum including severe and non-severe clinical manifestations. After the incubation period, disease manifestations begin suddenly and are followed by three phases, namely febrile, critical and recovery phases. The manifestations of DHF are quite complex, but the therapy is relatively simple, inexpensive and very effective in saving sufferers' lives as long as the intervention is carried out adequately and on time. The key to disease management is early detection and good understanding of clinical problems throughout the three phases of the disease. There is no specific therapy for DD and DHF. The main principle is supportive therapy. Proper treatment can save dengue sufferers. Maintaining circulating fluid volume is the most important action in treating dengue cases. The patient's fluid intake, especially oral fluids, must be maintained. If the patient's oral fluid intake is insufficient, intravenous fluid supplements are needed to prevent dehydration and hemoconcentration. Early detection of plasma leakage is very important so that the management given can be adequate so that the death rate in dengue infection can be reduced. (Decree of the Minister of Health of the Republic of Indonesia, 2020).

### **Case Report**

The patient came to the Dumai Regional Hospital with complaints of fever since 4 days ago, the fever continuously felt up and down, the patient also complained of headache and pain behind the eyes which were getting worse for two days at SMRS, the headache felt like it was being stabbed and the headache was so severe that it was very disrupt activities. The patient also complained of pain throughout the body, especially in the joints, the patient said he often had nosebleeds at night. Other complaints include decreased appetite, nausea (+) and vomiting (-), normal bowel movements and urination, the patient has taken medicine for fever, complaints of fever disappear for a while but appear again. The patient has never experienced similar complaints, history of hitting the head (-), history of hypertension (-), history of DM (-)

) The patient took paracetamol fever medicine, the fever disappeared briefly but appeared again. There is no patient's family with the same complaint, history of hypertension (-), history of DM (-) The patient is a housewife who spends her daily life at home, eats regularly 3 times a day but rarely eats vegetables and fruit, drinks enough, the patient rarely exercises. On physical examination, blood pressure was found to be 130/90 mmHg, temperature 38.5 degrees C, flushing (+), tourniquet (+), on blood examination it was found. On supporting examinations, routine blood laboratory results showed that the platelet value was 96,000 mm<sup>3</sup> and the leukocyte value was 2,800 mm<sup>3</sup>.

### 3. RESULTS AND DISCUSSION

28 year old patient came to the emergency room at Dumai Regional Hospital with complaints of fever since 4 days ago, the fever felt up and down, the patient also complained of headache and pain behind the eyes which were getting worse two days before entering the hospital (SMRS), the headache felt continuously like being stabbed. and the headache is so severe that it really interferes with activities. The patient also complained of pain throughout the body, especially in the joints, the patient said he often had nosebleeds at night. Other complaints include decreased appetite, denied nausea and vomiting, normal bowel movements and urination.

Based on the history, the complaints experienced by the patient are in accordance with the theory of dengue hemorrhagic fever (DHF) where in the febrile phase there is a sudden fever for 2-7 days and the fever continues to feel up and down like a saddle curve, severe headache, joint pain, nosebleeds in the signs of bleeding and also decreased appetite.

On physical examination, the patient's vital signs found a body temperature of 38.5°C, which is classified as a fever, and the patient stated that previously the fever had reached a temperature of 39°C, in accordance with the DHF theory which states a sudden high fever. Follow-up physical examination found flushing (+) and the tourniquet test (+) was in accordance with the DHF theory that there were signs of spontaneous bleeding.

In supporting examinations, routine blood laboratory results showed that the platelet value had decreased to 96,000 mm<sup>3</sup> and the leukocyte value had also decreased, namely 2,800 mm<sup>3</sup>. This is in accordance with the DHF theory that blood tests found thrombocytopenia and leukopenia.

The patient was found to have a positive tourniquet test and leukopenia. From the initial screening it was found that the patient was suspected of having DHF. Next, the diagnosis is made through history taking, physical examination and support.

The patient's diagnosis was dengue hemorrhagic fever grade II (DHF grade II), this diagnosis could be made because based on the history, the patient complained of fever continuously going up and down, headache, joint pain, nosebleeds and decreased appetite, from the results of the physical examination there were signs of flushing and petechial spots that indicate signs of spontaneous bleeding. On routine blood laboratory investigations, thrombocytopenia and leukopenia were found. From this summary, the diagnosis of dengue hemorrhagic fever grade II (DHF grade II) can be made, because the diagnostic criteria for DHF grade II are fever accompanied by 2 or more symptoms such as headache, retroorbital pain, myalgia, arthralgia plus spontaneous bleeding.

The initial therapy given to patients is IVFD Asering fluid therapy with a volume of 2400ml 30 tpm calculated according to the fluid requirements formula for the purpose of rehydration in DHF patients, if the platelets are still  $< 100,000$ , the amount of fluid given is constant. Omeprazole 40 mg IV injection is given for symptomatic complaints, namely discomfort in the stomach. Metoclopramide 10 mg IV injection is given if the patient feels nausea and vomiting. Paracetamol is given for complaints of fever. For patient planning, it is planned to check Dengue IgG and IgM to find out whether there is dengue virus in the blood for routine Hb, Ht, platelets per day. [15,17]

Based on anamnesis, physical examination and supporting examination can determine the prognosis of dengue hemorrhagic fever (DHF grade II) which tends to have a poor prognosis if not treated immediately. In DHF / DSS, mortality is quite high. Research on adults in Surabaya, Semarang, and Jakarta shows that the prognosis and course of the disease are generally milder than in children.

#### **4. CONCLUSION**

1. Dengue hemorrhagic fever (DHF) is an infectious disease caused by the dengue virus with clinical manifestations of fever, muscle pain and/or joint pain accompanied by leukopenia, rash, lymphadenopathy, thrombocytopenia and hemorrhagic diathesis . In DHF, plasma leakage occurs which is characterized by hemoconcentration (increased hematocrit) or fluid accumulation in the body cavity.
2. In this case, there were symptoms and signs of grade II DHF, namely fever for 4 days, headache, pain behind the eyes, joint pain, nausea, nosebleeds. On physical examination, there was an increase in temperature of  $38.5^{\circ}\text{C}$ , tourniquet (+), flushing (+). On supporting examination, thrombocytopenia and leukopenia were found

3. Management of grade II DHF is fluid therapy according to the fluid requirement formula for DHF patients, as well as symptomatic therapy.

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