http://ejournal.seaninstitute.or.id/index.php/healt
Jurnal Eduhealt, Volume 14, No. 04 2023
E-ISSN. 2808-4608

# Rationality Of Analgesic-Antipyretic Use In Dengue Hemorrhagic Fever Patients

**Indah Sri Hartini[1*], Eko Yudha Prasetyo[2], Dyah Ayu Kusumaratni[3], Arshy Prodyanatasari[4]**
[1,2,3,4]Institut Ilmu Kesehatan Bhakti Wiyata Kediri, Indonesia

**ARTICLE INFO**

***Keywords:***
analgesic antipyretic, dengue haemorrhagic fever, rationality

**ABSTRACT**

Dengue haemorrhagic fever (DHF) is a disease caused by acute dengue virus infection transmitted through the bite of the Aedes Aegepty mosquito. Data from the health department states that the increase in the Case Fatality Rate (CFR) of DHF in 2020 is 0.8% and in 2021 is 1.1% while the national target is <1%. DHF patients need proper treatment to minimize the occurrence of contraindications in patients. DHF patients generally experience initial symptoms of sudden high fever >38oC, headache or pain behind the eyeball, muscle and bone pain. Treatment of DHF patients to reduce the pain experienced is by giving the right antipyretic analgesic. Based on this, the researcher wants to examine the description of the use of analgesic-antipyretics to determine the rationality level of the use of analgesic-antipyretics in DHF patients. The rationality of analgesic-antipyretic use measured, including patient accuracy, drug accuracy, indication accuracy, and dose accuracy. The type of research conducted was non-experimental observational research with retrospective data collection and the sampling technique used was totality sampling. Data collection was carried out based on patient medical record data in the period January-August 2022. In accordance with WHO guidelines and the National Guidelines for Health Services for Dengue management, the provision of analgesic-antipyretic drugs in accordance with the drug of choice is paracetamol. Based on the data obtained, there were 74 DHF patients with 57% female patients and 43 male patients, and 42% of patients were children. The rationality of analgesic-antipyretic use in DHF patients is known to be 100% right patient; 37.84 right drug; 100% right indication; and 98.65% right dose.

Email :
arshy.prodyanatasari@iik.ac.id



## 1. INTRODUCTION

Dengue haemorrhagic fever (DHF) is an infectious disease transmitted by the dengue virus which comes from the flaviviradae family, arthropod borne virus and genus flavivirus (Wirantika, 2020). DHF is transmitted through the bite of the Aedes aegypti mosquito, which actively bites between 09:00 - 10:00 or 16:00 - 17:00 and often occurs in tropical and subtropical areas, including Australia and Indonesia (Wirantika, 2020; Kemenkes, 2016; Papaemmanuil et al, 2013). In Australia, the spread of DHF is caused by Aedes aegypti and Aedes albopictus mosquitoes. The disease can occur throughout the year and affect all segments of society. The spread of DHF is related to environmental conditions and community behaviour (Ministry of Health, 2016). In the rainy season, where air humidity increases, it will increase the number of mosquito breeding sites (Butarbutar, 2019). If an area (place) has an environment that is not maintained cleanliness, there are uncovered water storage containers, so that it becomes a breeding ground for mosquitoes, this will increase the potential for the spread of DHF (Herawati, 2022; Yudhastuti, 2020; Nasriah, 2019). Dengue fever (DHF) has early signs of sudden high fever, lethargy, severe headache, joint and muscle pain, nausea, vomiting, and a rash may develop. The rash will usually appear when the sufferer feels sick. The rash first appears around the chest, body and abdomen and then spreads to the limbs (hands and feet) (Ilham, 2023; Ningsih, 2023; Ginanjar, 2008).

The East Java Provincial Health Office (East Java DHO) stated that the Case Fatality Rate (CFR) of DHF in 2020 was 0.8% and increased in 2021 to 1.1%. This shows that the death rate from

DHF in East Java is still high and above the national target set by the Ministry of Health (Kemenkes), which is <1% (Jatim, 2021). In patients who have initial symptoms of sudden fever of more than 38oC without any clear cause, WHO recommends giving drugs as the first choice is analgesic-antipyretic drugs, namely paracetamol. However, inappropriate use of paracetamol can affect severity, bleeding, stomach irritation, and other conditions (WHO, 2011).

Based on the results of research conducted by Ningrum (2023), it is known that there are therapeutic problems in DHF patients where the data obtained on the use of analgesic-antipyretic drug doses in Dengue Haemorrhagic Fever patients is 55%. In line with Sholihah's research (2023), it was found that 83.1% of analgesic-antipyretic drug administration was inappropriate dosage and 76.1% were categorized as inappropriate duration of drug administration, but the rationality of paracetamol administration in the inpatient installation of Sunan Kudus Islamic Hospital was more than irrational. Research conducted by Meiriska (2021), found that there was therapy that was not in the right dose of 86.67% and 13.33% of patients were inappropriate for the drug.

Based on the results of research that has been conducted by previous researchers, the researchers are interested in conducting research on the rationality of the use of analgesics-antipyretics in patients with dengue fever (DHF) in the inpatient installation of Budi Rahayu Hospital during the period January-August 2022. This was done to determine the description of the administration and use and rationality of analgesic-antipyretic drugs in DHF patients, including: the right indication, the right drug, the right dose, and the right patient.

## 2. METHOD

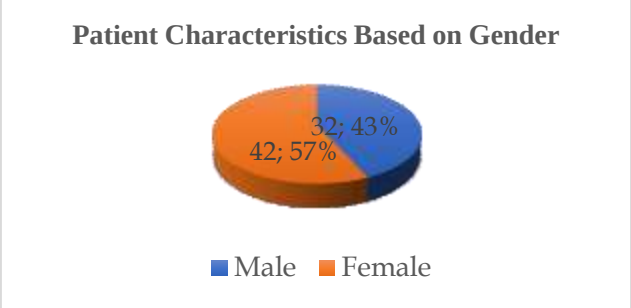
The research method used is observational non-experimental, where researchers collect data retrospectively (Waruwu, 2023). Researchers make observations of research variables without intervening on these variables first. The study population was all patients diagnosed with DHF at Budi Rahayu Hospital, Blitar during the January-August 2022 period. The data collection technique used totality sampling (Kusumastuti, 2020). Data analysis used descriptive analysis with univariate analysis, including: patient characteristics, description of analgesia-antipyretic use, and rationality of analgesia-antipyretic use.

## 3. RESULT AND DISCUSSION

Research on the rationality of the use of analgesics-antipyretics in Dengue Haemorrhagic Fever (DHF) patients at Budi Rahayu Hospital Blitar with a research sample of all patients diagnosed with DHF in the January-August 2022 period, based on inpatient medical record data obtained the following results:

**Patient Characteristics Based on Gender**

Based on medical record data from Budi Rahayu Hospital in the January-August 2022 period, there were 74 patients who met the study inclusion criteria. The 74 patients consisted of 42 patients (57%) female and 32 patients (43%) male. From this data, it is known that the number of female patients is more than male patients. In accordance with the Ministry of Health (2016), the spread of DHF does not recognize gender, so the proportion of DHF patients cannot be determined that the percentage of women infected with DHF is greater than men. However, the incidence of DHF is influenced by environmental conditions and community behaviour.




Source: personal documents

**Picture 1**. Patient Characteristic Based on Gender

**Patient Characteristics Based on Age**

Based on medical record data from Budi Rahayu Hospital in the January-August 2022 period, there were 74 patients who met the study inclusion criteria. The 74 patients can be classified based on age characteristics according to Table 1.

**Table 1.** Patient Characteristics Based on Age

| No. | Classification | Age Range (year) | amount (person) |
|---|---|---|---|
| 1 | Toddler | 0 – 5 | 17 |
| 2 | Children | 6 – 11 | 32 |
| 3 | Teenagers | 12 – 25 | 12 |
| 4 | Adults | 26 – 45 | 10 |
| 5 | Elderly | 46 – 65 | 2 |
| 6 | Seniors | >65 | 1 |

In the research data obtained in Table 1, it is known that most DHF patients are children and toddlers, namely 32 children and 17 children. This is in accordance with WHO data, where DHF is mostly suffered by children under the age of 15 years. The prevalence of children under the age of <15 years affected by DHF can be influenced by the body's immunity that is sufficient for dengue infections with different serotypes, children's activities that are more dominant in the classroom thus increasing the risk of exposure to dengue virus vectors. To prevent and reduce the transmission of DHF due to Aedes aegypti mosquito bites in the school environment, good cooperation with all school residents is needed in maintaining the cleanliness of the school environment, especially minimizing water reservoirs or containers that allow water to be stored which may be a breeding ground for Aedes aegypti mosquitoes. The results of the research on the characteristics of patients based on age are in line with the results of research conducted by Aliyyu (2023) which was carried out in 2021, where the proportion of the most vulnerable age to suffer from DHF is the 12-year-old age group because the majority of activities are at school.

The prevalence of DHF based on the age of the patient is related to daily activities and the level of mosquito biting activity which is dominant in the morning and evening. This will affect anyone who is more active indoors with a less clean environment or many places of stagnant water that become breeding grounds for mosquitoes that cause DHF.

According to research conducted by Dewi (2023), the results showed that children who were sick with DHF mostly had high outdoor activities. Another factor is because children aged less than 15 years still have a low immune system. Whereas children aged 15 years and above have a complex immune system. That is the reason the incidence of DHF often occurs in children under 15 years of age (Mardhatillah., 2020).

**Overview of Analgesic-Antipyretic Usage**

The use of analgesic-antipyretic drugs in DHF patients through two drug administration therapies, namely single therapy and combination therapy. Based on medical record data, the use of analgesics-antipyretics in DHF patients at the Budi Rahayu Hospital inpatient installation for the January-August 2022 period can be seen in Table 2.

**Tabel 2**. Overview of Analgesic-Antipyretic Usage

| No. | drug administration | drug name | amount (person) |
|---|---|---|---|
| 1 | single | Paracetamol | 28 |
| 2 | combination | Metamizole sodium + paracetamol | 22 |
| 3 | single | Metamizole sodium | 21 |
| 4 | combination | Metamizole sodium + Methampyrone 500 mg + diazepam 2 mg | 2 |
| 5 | combination | Metamizole sodium + mefenamat acid | 1 |

(Source: personal documents)

Paracetamol is an analgesic-antipyretic drug that can be given to people with DHF as a fever-reducing drug. Paracetamol works on the central nervous system, namely in the hypothalamus. The hypothalamus works to regulate body temperature regulation. The administration of paracetamol aims to inhibit prostaglandin synthesis, so as to reduce mild to moderate pain. In addition to paracetamol, analgesic-antipyretic drugs that can be given to DHF patients to reduce fever are metamizole sodium.

This drug is included in the class of non-steroidal anti-inflammatory drugs (NSAIDs). Metamizole sodium has analgesic, antipyretic, spasmolytic, and weak anti-inflammatory effects. However, in some countries, the use of metamizole sodium is highly restricted due to side effects that can cause agranulocytosis, aplastic anemia, and thrombocytopenia. In Indonesia, the intensity of metamizole sodium use is still quite high due to inadequate references related to the resulting side effects. In an effort to ensure safety, metamizole sodium is only given to patients if injectable analgesic-antipyretics are needed or if the patient cannot tolerate safer analgesic-antipyretic drugs.

Other analgesic-antipyretic uses that were often given to DHF patients were a combination of metamizole sodium and paracetamol with a percentage of 30% (22 patients), a combination of metamizole and methampyrone 500 mg tablets by 3% (2 patients), and a combination of metamizole and mefenamic acid by 1% (1 person). The administration of analgesic-antipyretic metamizole sodium and paracetamol has no risk of gastrointestinal bleeding, so this drug combination is a safe analgesic-antipyretic drug combination given to DHF patients who are contraindicated in non-steroidal analgesic drugs. The administration of metamizole sodium and paracetamol uses the lowest dose in the shortest possible time while still paying attention to contraindication symptoms that may appear in DHF patients after taking the drug.

**Rationality of Analgesic-Antipyretic Use**

In the use of analgesic-antipyretic drugs, drug use evaluation is needed. Evaluation of drug use is a form of clinical pharmacy service which is a systematic and continuous process in assessing the rationality of drug therapy based on drug use data in the service system that refers to the criteria and standards set by the Ministry of Health (2019). The level of rational use of drugs is measured through 4 (four) parameters, namely: (1) assessment of patient accuracy, (2) drug accuracy, (3) indication accuracy, and (4) dose accuracy.

**Dose Accuracy**

Patient accuracy is expressed as an effort to provide Health interventions by looking at the patient's condition. Patient accuracy is carried out by observing contraindications experienced by patients on the use of prescribed drugs when patients receive therapy from the hospital. If no contraindications occur, it can be stated that the treatment given is appropriate for the patient. In the medical record data of inpatients at Budi Rahayu Hospital in the period January-August 2022, it was found that 100% of patients did not experience contraindications to the analgesic-antipyretic drugs prescribed during treatment therapy. The data can be seen in Table 3.

**Table 3.** Patient Appropriateness Assessment

| No. | Patient Appropriateness Assessment | amount | Percentage (%) |
|---|---|---|---|
| 1 | Right Patient | 74 | 100 |
| 2 | Inappropriate Patient | 0 | 0 |

**Medication Appropriateness**

Drug administration to patients is declared appropriate if in their treatment history, patients receive treatment in accordance with the drug of choice contained in the 2011 WHO guidelines and the National Guidelines for Medical Services for the Management of Dengue Infection. In DHF patients, paracetamol is the drug of choice used to control pain. If in the patient's treatment history there is the use of analgesic-antipyretic drugs that are not the drug of choice according to the guidelines, then the use of drugs can be declared inappropriate. Based on medical record data on the use of drugs for DHF patients at Budi Rahayu Hospital in January-August 2022, it can be seen in Table 4.

**Table 4**. Medication Appropriateness Assessment

| No. | Medication Appropriateness Assessment | Amount | Percentage (%) |
|---|---|---|---|
| 1 | Appropriate Medication | 28 | 37,84 |
| 2 | Not Appropriate | 46 | 62,16 |

In Table 4, it is known that 62% of patients are declared inappropriate drugs. This is due to patients who received analgesic-antipyretic treatment in the form of metamizole sodium, a combination of metamizole sodium and paracetamol, a combination of metamizole sodium, methampyrone 500 mg and diazepam 2 mg, a combination of metamizole sodium and mefenamic

acid. The provision of these drugs is not in accordance with the drug of choice set by WHO and the National Guidelines for Medical Services for the Management of Dengue Infection where the treatment to relieve pain in DHF patients is paracetamol.

**Appropriateness of Indication**

The accuracy of the indication can be known from the patient's medical record data based on the results of the medical diagnosis performed, complaints felt by the patient, and the results of laboratory tests to strengthen the medical diagnosis. DHF patients generally complain of sudden high fever with temperatures >38oC, headache or pain behind the eyeball, muscle and bone pain. Based on patient medical record data during the January-August 2022 period, 74 patients were diagnosed with DHF, with details as in Table 5.

**Table 5.** Assessment of Appropriateness of Indication

| No. | Medication Appropriateness Assessment | Amount | Percentage (%) |
|---|---|---|---|
| 1 | Appropriate Indication | 74 | 100 |
| 2 | Inappropriate Indication | 0 | 0 |

**Dosage Accuracy**

The fourth parameter of rational use of analgesics-antipyretics is the accuracy of the dose of drug use given to patients. The accuracy of the intended dose is the quantity of drugs given whether it is in the recommended and required therapeutic dose range. If the dose given exceeds the maximum threshold needed, it will increase the risk of side effects in patients and if the dose is too low it will reduce the achievement of the treatment therapy carried out. Based on this, an evaluation of the accuracy of treatment doses in DHF patients can be seen in Table 6.

**Table 6**. Dose Accuracy Assessment

| No. | Medication Appropriateness Assessment | Amount | Percentage (%) |
|---|---|---|---|
| 1 | Right Dose | 73 | 98,65 |
| 2 | Not Right Dose | 1 | 1.35 |

In the treatment of DHF patients who were declared inappropriate doses as much as 1 patient due to the dose given exceeded the dose range needed by the patient. This is based on the patient's body weight (BB) of 44 kg and giving drugs in the form of mefenamic acid in the form of tablets with an intensity of administration of 3x500 mg. In this patient, the required dose was only 440 mg of mefenamic acid with an intensity of administration every 6-8 hours.

## 4. CONCLUSION

The provision of analgesic-antipyretic drugs in accordance with the drug of choice established by WHO and the National Guidelines for Health Services Management of Dengue Infection is paracetamol. In the treatment therapy of DHF patients at Budi Rahayu Hospital in the January-August 2022 period, treatment was carried out using single and combined treatment with a rational level of drug use, namely: 100% correct patient; 37.84% correct drug; 100% correct indication; and 98.65% correct dose.

## REFERENCES

Mardhatilah, S., Ambiar, R. I., & Erlyn, P. (2020). Picturean Kejadian Demam Berdarah Dengue (Dbd) Di Wilayah Kerja Puskesmas Dempo Kota Palembang. *MESINA (Medical Scientific Journal)*, *1*, 23-32.

Kemenkes,R.I. (2016). Kementerian Kesehatan Republik Indonesia. Indonesia: Ditjen Gizi dan Kia.

Wirantika, W. R., & Susilowati, Y. (2020). Pengaruh Pendidikan Kesehatan terhadap Pengetahuan dan Perilaku Siswa dengan Persebaran Demam Berdarah Dengue (DBD) Di Sekolah. *Jurnal Health Sains*, *1*(6), 427-431.

Papaemmanuil, E., Gerstung, M., Malcovati, L., Tauro, S., Gundem, G., Van Loo, P., ... & Campbell, P. J. (2013). Clinical and biological implications of driver mutations in myelodysplastic syndromes. *Blood, The Journal of the American Society of Hematology*, *122*(22), 3616-3627.

Butarbutar, R. N., Sumampouw, O. J., & Pinontoan, O. R. (2019). Trend Kejadian Demam Berdarah Dengue Di Kota Manado Tahun 2009-2018. KESMAS: Jurnal Kesehatan Masyarakat Universitas Sam Ratulangi, 8(6).

Nasriah, N. (2019). Faktor yang berhubungan dengan kejadian dbd di Pulau Balang Lompo Kabupaten Pangkep. Sulolipu: Media Komunikasi Sivitas Akademika dan Masyarakat, 17(2), 73-81.

Yudhastuti, R., & Lusno, M. F. D. (2020). Picturean Kasus Demam Berdarah Dengue (DBD) Di Pulau Bali Tahun 2012-2017. Jurnal Kesehatan Lingkungan Indonesia, 19(1), 27-34.

Herawati, A., Febrianti, D., Santoso, D., Putra, F. B. A., Sitorus, G. G., & Tasya, R. A. (2022). Analisis Pencegahan Demam Berdarah Dengue (DBD). Journal of Public Health Education, 1(4), 221-228.

Ginanjar, G. (2008). Demam berdarah. PT Mizan Publika.

Ningsih, T. A., & Assagaff, F. (2023). Modul Penanggulangan DBD oleh Tim Jumantik SD.

Ilham, S. P. I. (2023). *Profil Penderita Demam Berdarah Dengue Di Rawat Inap Di Rsud Nene Mallomo Kabupaten Sidrap Tahun 2021* (Doctoral dissertation, Universitas Hasanuddin).

Jatim, D. (2021). Profil Kesehatan Dinas Kesehatan Provinsi Jawa Timur 2021. *Dinas Kesehatan Provinsi Jawa Timur*.

Waruwu, M. (2023). Pendekatan Penelitian Pendidikan: Metode Penelitian Kualitatif, Metode Penelitian Kuantitatif dan Metode Penelitian Kombinasi (Mixed Method). *Jurnal Pendidikan Tambusai*, *7*(1), 2896-2910.

Dewi, D. A. I. P., Lely, A. A. O., & Aryastuti, S. A. (2023). Picturean Faktor Risiko Penyakit Demam Berdarah Dengue pada Anak di Wilayah Kerja Puskesmas Tabanan I. *AMJ (Aesculapius Medical Journal)*, *3*(1), 25-31.

WHO. (2011). *Comprehensive Guidelines for Prevention and Control of Dengue and Dengue Haemorrhagic Fever*. In WHO Regional Publication SEARO (Issue 1)

Sholihah, S. H., Retnowati, E., & Fitria, N. E. L. (2023, January). Rasionalitas Penggunaan Parasetamol Pasien Anak 1-12 Tahun Dengue Hemorrhagic Fever di Instalasi Rawat Inap RS. In *Prosiding University Research Colloquium* (pp. 1571-1576).

Ningrum, D. M., & Permana, D. A. A. S. (2023). Kajian Pengobatan Dengue Haemoragic Fever (DHF) di Rumah Sakit Pendidikan Universitas Mataram. *Lumbung Farmasi: Jurnal Ilmu Kefarmasian*, *4*(1), 1-6.

Meriska, N., Susanti, R., & Nurmainah, N. (2021). Evaluasi Penatalaksanaan Terapi Penyakit Demam Berdarah Dengue (Dbd) Pada Pasien Anak Di Instalasi Rawat Inap Rsud Sultan Syarif Mohamad Alkadrie Tahun 2019. *Jurnal Mahasiswa Farmasi Fakultas Kedokteran UNTAN*, *5*(1).

Aliyyu, H. (2023). Picturean Kasus Demam Berdarah Dengue Pada Usia Anak Sekolah di RSUD Dr. Drajat Prawiranegara Tahun. *Jurnal Locus Penelitian dan Pengabdian*, *2*(10), 978-986.