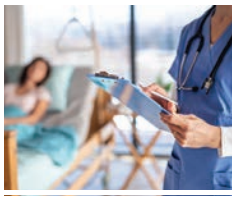

Pleural Effusion and Ascites in Child with Dengue Haemorrhagic Fever and Its Management

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ABSTRACT

Background: Dengue haemorrhagic fever (DHF) is caused by dengue virus type 1-4; it is still endemic in Indonesia. **Case:** A 1 year and 11 months--old baby-girl with fever, lethargic, nausea and vomiting, and thrombocytopenia. She was diagnosed with dengue hemorrhagic fever. Pleural effusion and ascites were diagnosed after fluid resuscitation. Clinical improvement was observed after furosemide therapy and could be discharged after seven days of treatment. **Conclusion:** Diuretic administration can be considered in case of dengue haemorrhagic fever with severe plasma leakage. Further research is needed.

Keywords: Ascites, dengue haemorrhagic fever, diuretic, pleura effusion.

ABSTRAK

Latar Belakang: Demam berdarah dengue (DBD) disebabkan oleh virus dengue tipe 1-4; Indonesia masih menjadi salah satu negara endemis DBD. **Kasus**: Anak perempuan berusia 1 tahun 11 bulan dengan keluhan demam, letargi, mual dan muntah, serta penurunan jumlah trombosit. Pasien didiagnosis demam berdarah dengue. Setelah resusitasi cairan pada hari kedua ditemukan efusi plura kanan dan asites. Diberikan terapi *furosemide*; pasien mengalami perbaikan klinis dan dapat dipulangkan setelah tujuh hari perawatan. **Simpulan**: Pada beberapa kasus DBD dengan kebocoran plasma yang berat pemberian diuretik dapat dipertimbangkan. Masih diperlukan penelitian lanjutan. **Asterisa Retno Putri, Runi Arumndari, Claudia Natasha Liman, Anak Agung Made Sucipta. Efusi Pleura dan Asites pada Anak Demam Berdarah Dengue dan Tata Laksananya.**

Kata Kunci: Asites, demam berdarah dengue, diuretik, efusi plura.

INTRODUCTION

Dengue infection is a disease caused by dengue virus, belonging to the Flaviviridae family with 4 serotypes, DEN-1, DEN-2, DEN-3, and DEN-4.[1] Dengue ranks as the most important mosquito-borne virus in the world. Outbreaks have a huge impact on populations, health systems and economies in most tropical countries of the world.[2,3]

Dengue hemorrhagic fever (DHF) were recorded at 138,127 cases in 2019. This number increased compared to 65,602 cases in 2018. Deaths due to DHF was also increased from 467 in 2018 to 919 deaths in 2019. The incidence rate of DHF in 2019 was 51.53 per 100,000 population; increased from 26.1 and 24.75 per 100,000 population in 2017 and 2018.[4]

The most common symptoms are high fever, headache, body aches, nausea and rash. Some cases enter the shock phase as severe dengue and require hospitalization.[1,5] The increased vascular permeability in severe DHF may lead to plasma leakage into the peritoneum, pleural cavity or pericardium.[6] A case of a child with dengue hemorrhagic fever with pleural effusion and ascites is presented.

CASE

A 1 year-old female baby was admitted with fever since 4 days. The fever was said to be continuous despite being given paracetamol, accompanied with nausea and vomiting, decreased appetite and drinking. Other complaints such as bleeding manifestation were denied.

Examination showed body weight 12 kg and body length of 90 cm, with good nutritional status. The temperature was 38.3^{0}C, pulse rate 100x/min, respiratory rate 24x/min, oxygen saturation 99% in room air. Laboratory tests showed haemoglobin (Hb) 12.3 g/dL, hematocrit (Ht) 36.9%, leukocytes (L) 4,180/uL, platelet count 147,000/uL, blood sugar (BS) 78 mg/dL, sodium (Na) 131 mmol/L, potassium (K) 4.9 mmol/L, and chloride (Cl) 96 mmol/L. The patient was diagnosed as dengue hemorrhagic fever due to prolonged fever with thrombocytopenia.

The patient was managed with dextrose 5% ½ NS 14 drops per minute (tpm) or 1,000 mL/day, paracetamol syrup 120 mg every 6 hours and ondansetron intravenous injection (IV) 1.5 mg every 8 hours. After 12 hours of hospitalization, patient showed symptoms of pre-shock, with blood pressure of 90/60

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mmHg, temperature 37.1°C, pulse rate 116 times/min, respiratory rate 30 times/min, and oxygen saturation 97%. The patient appeared lethargic, with chest wall retraction, rhonchi in both lung basals, abdominal distension with abdominal circumference of 48 cm, and cold acral. Diuresis 5 mL/kg/h for 6 hours. A complete blood test (DL) results were Hb 12.7 g/dL, Ht 37.7%, leukocytes 3,380/uL, platelets 42,000/uL. Chest X-ray revealed right pleural effusion and abdomen X-ray suspect ascites.

Additional therapy was given, consisted of furosemide IV 20 mg, ceftriaxone IV 250 mg every 12 hours, and inhalation of ipratropium bromide, salbutamol every 6 hours. Repeat blood test 6 hours later results were Hb 13.5 g/dL, Ht 39.3%, leukocytes 6,630/uL, platelets 24,000/uL, albumin 2.0, ALT (alanine aminotransferase) 50, AST (aspartate aminotransferase) 144, urea 20, creatinine 0.3, natrium 122 mmol/L, potassium 4.2 mmol/L, and chloride 91 mmol/L. The fluid therapy was replaced with NaCl 0.9% 1,000 mL/day, and 20% albumin 100 mL with furosemide IV 60 mg as premedication. On the 8th day of hospitalization, the patient's condition was improving with no shortness of breath and no fever, reduced abdominal distension.

DISCUSSION

DHF is a disease caused by dengue virus type 1-4, with clinical manifestations of sudden fever of 2-7 days accompanied by bleeding symptoms with or without shock; also accompanied by thrombocytopenia (platelets less than 100,000) and 20% or more

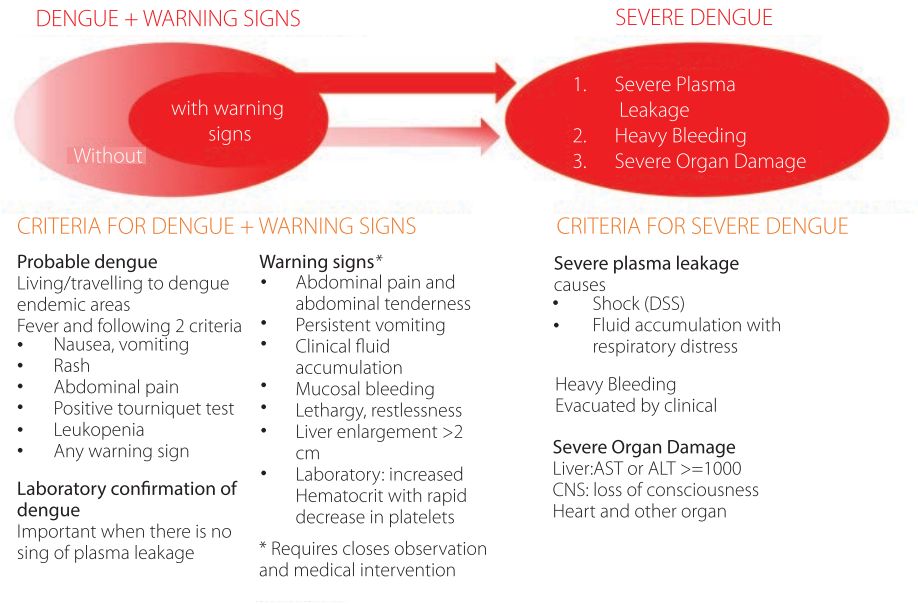


Figure 1. Symptoms and warning signs of dengue.[1]

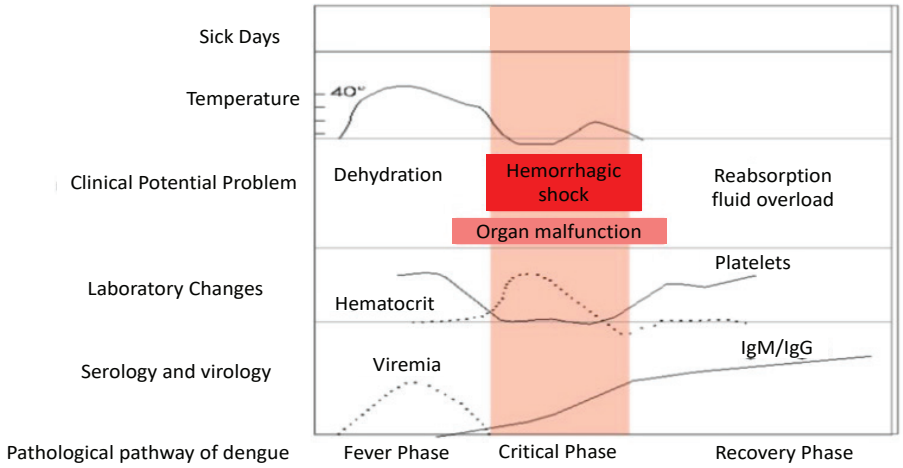
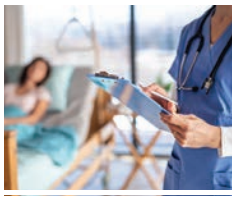


Figure 2. Course of illness.[1]

Table. Clinical and laboratory manifestation of dengue.[1]

Parameter	Description	Explanation
Clinical	Continuous vomiting (persistent)	≥ 3 episodes of vomiting within 12 hours and unable to tolerate oral fluids
	Abdominal tenderness or tenderness	Abdominal pain is continuous and increase in intensity so that it interferes with activity
	Restessness / lethargy	Decreased and/or irritable consciousness
	Mucosal bleeding	1) Nosebleeds/epistaxis 2) Gum bleeding 3) Skin bleeding in the form of petechia 4) Purpura 5) Bleeding in the conjunctiva, subconjunctiva
	Hepatomegaly >2 cm	Liver enlargement palpable through physical examination >2 cm
	Clinical fluid accumulation	Palpebral edema, pleural effusion, ascites
Laboratory	Hematocrit levels and platelet count	Increased hematocrit compared to before, accompanied by a rapid decrease in platelet count



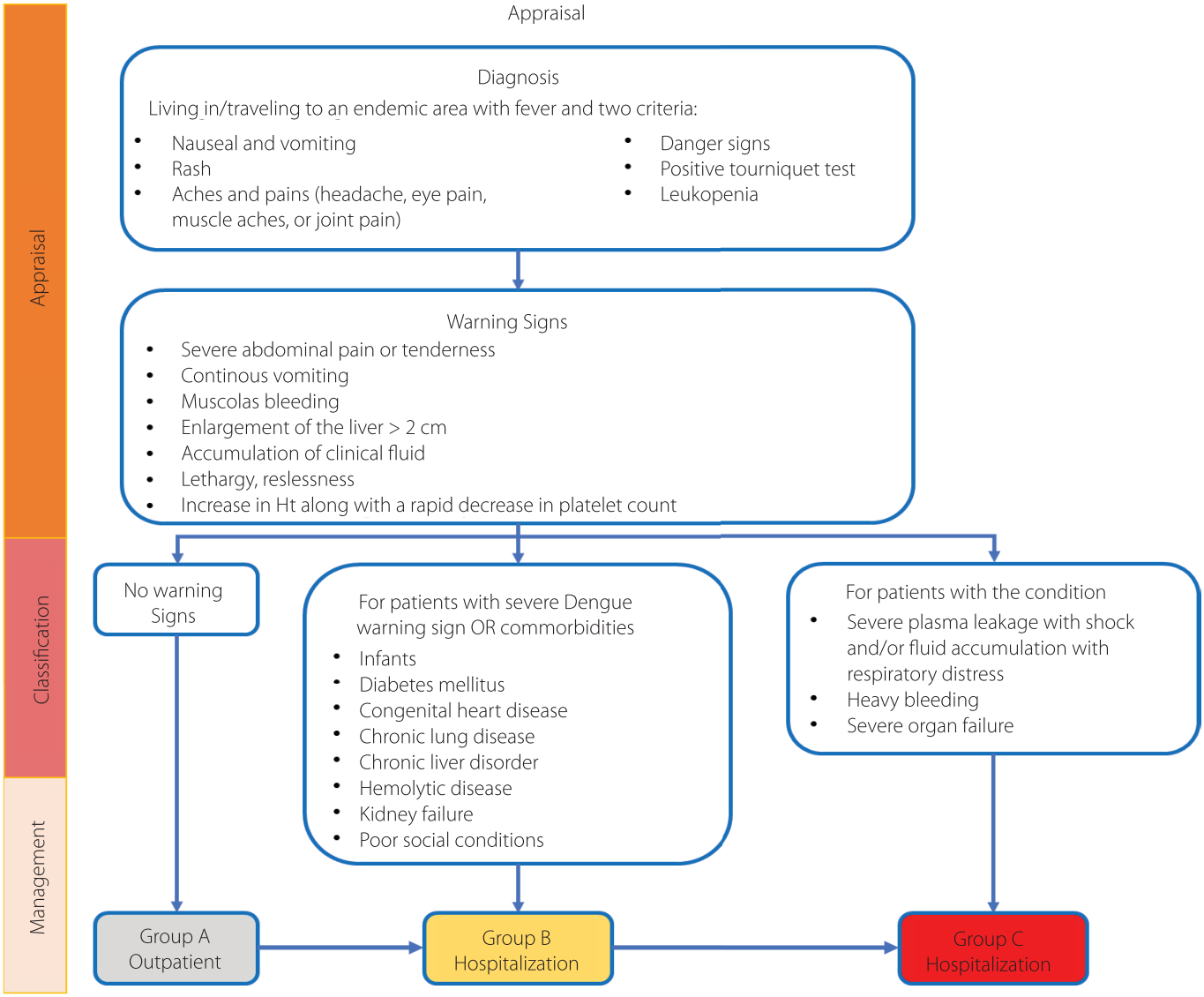


Figure 3. Flowchart of dengue management.[1]

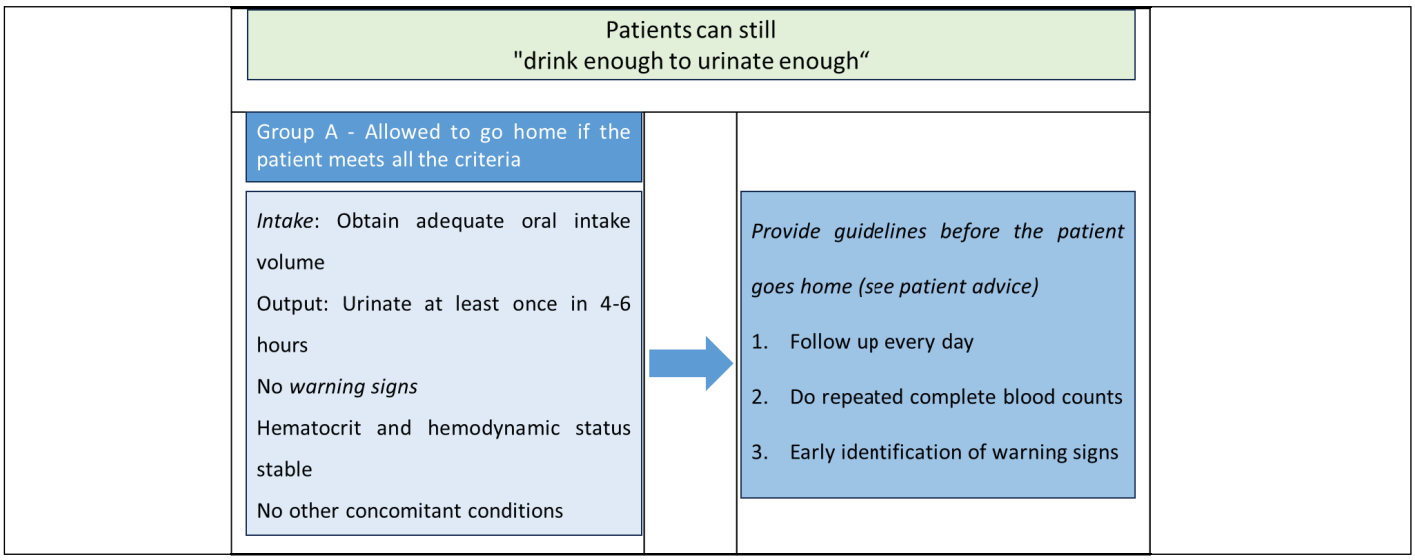
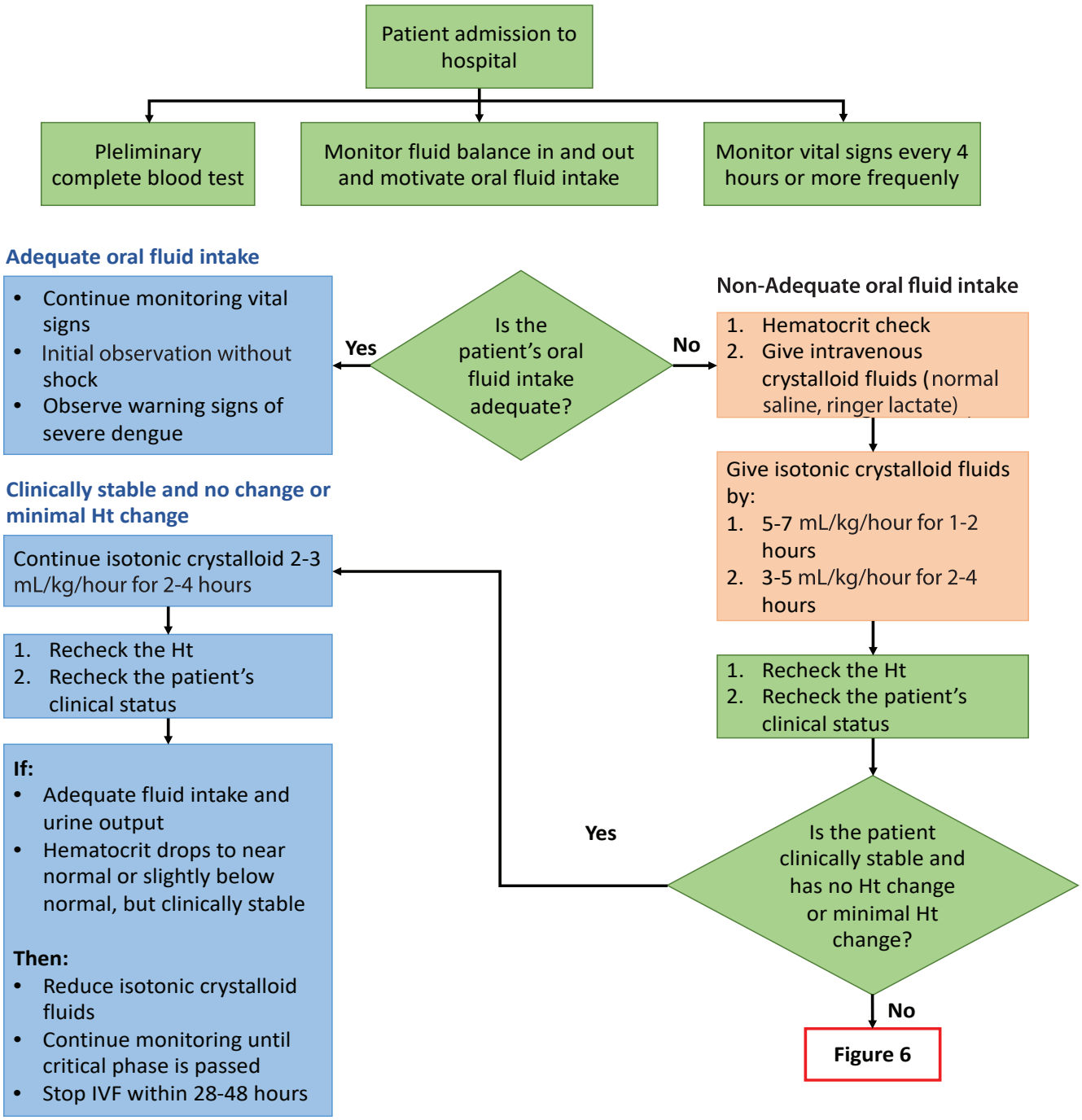
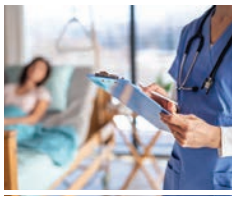


Figure 4. Management of dengue without warning sign (group A).[1,2]

Notes
Reassessment of hemodynamic status (Table 4)
1. Vital signs
2. *5-in-1 magic touch*: CCTV-R
   Color
   Capillary refill time
   Temperature
   Volume of pulse
   Rate
3. Volume of urine

Figure 5. Management of dengue with warning sign.[1,2]



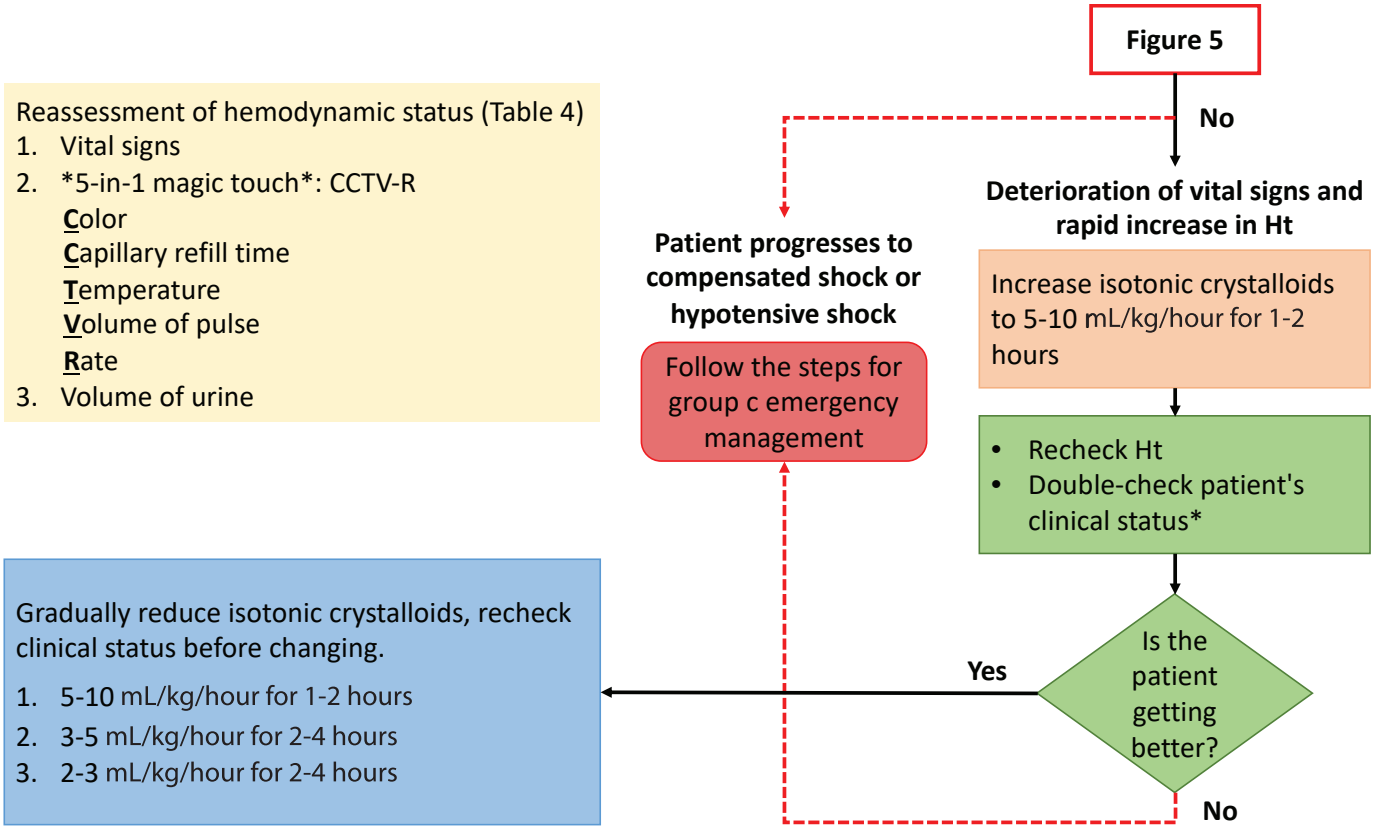


Figure 6. Management of dengue with warning sign.[1,2]

hematocrit increase from normal values.[1]

Classification of dengue fever: 1. Dengue without warning signs; 2. Dengue with warning signs; 3. Severe dengue (**Figure 1**). An overview of the course of dengue disease can be seen in **Figure 2.**[1,2] This case was diagnosed with dengue hemorrhagic fever with warning signs as there was a fever experienced continuously accompanied by nausea and vomiting and on examination found a decrease in platelets.

The pathology of DHF is increased systemic vascular permeability resulting in reduced intravascular plasma volume leading to plasma leakage into the peritoneum, pleural cavity, or pericardium, which may result in hypovolemic shock metabolic acidosis, major bleeding manifestations, and death in severe cases. This pathological process will improve spontaneously after a few days and most patients recover with appropriate supportive care.[6,7]

The flowchart of DHF management can be seen in the figure below (**Figure 3**), the management of DHF is divided into therapy A, therapy B and therapy C, the therapy depends on the severity of DHF and clinical manifestations that arise (**Figure 4-7**).[1,2]

In this case, the first treatment was fluid resuscitation due to the patient's clinical deterioration and led to hypovolemic shock and the patient's vital signs were improved, but on the second day the patient experienced plasma leakage characterized by ascites and pleural effusion and decrease in blood albumin levels as a sign of increased vascular permeability, but the patient experienced a slow improvement due to gradual return of extracellular fluid into intravascular system.[1]

The use of diuretics such as furosemide is still very questionable, but some severe dengue cases with acute respiratory distress showed improvement with this therapy.[8] Diuretics are used to improve oxygenation and avoid the need for mechanical ventilation in the recovery phase of dengue fever, although this research is still limited and diuretics is still controversially used.[8,9] In this case, furosemide was given followed by clinical and laboratory improvements, without side effects and was discharged on the sixth day of treatment.

CONCLUSION

In dengue cases with severe plasma leakage, diuretic use can be considered but further research is needed to assess the side effects of this therapy.

ACKNOWLEDGEMENT

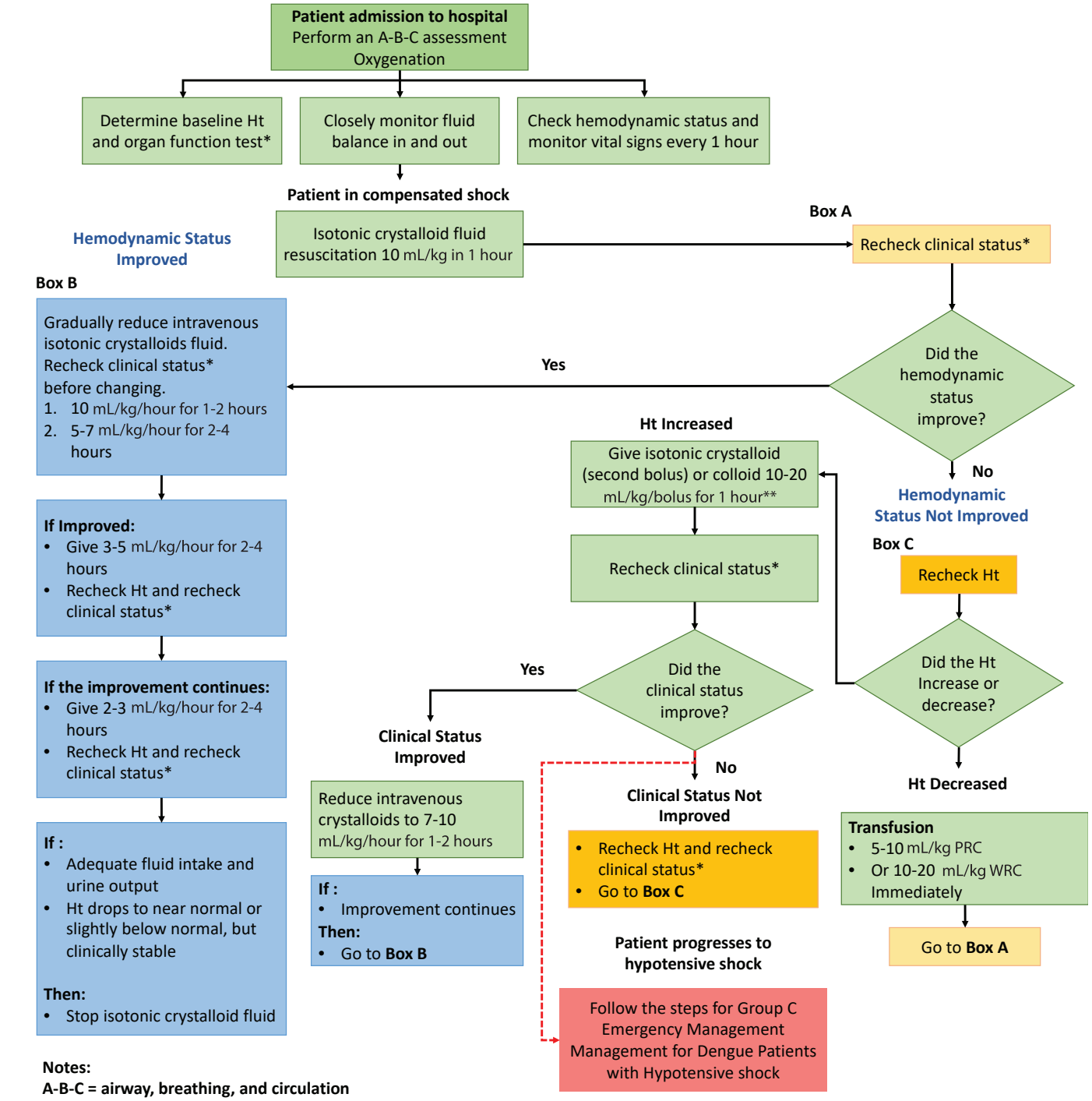
We would like to thank Dr. dr. I Wayan Bikin Suryawan, Sp.A(K), Head of the Child's Health Department from Wangaya Hospital, for the opportunity to prepare this case report.

AUTHORS CONTRIBUTION

Asterisa Retno Putri involved in concepting, designing, literature searching, and data analysis. Runi Arumndari and Claudia Natasha Liman involved in literature searching. Anak Agung Made Sucipta involved in supervising the manuscript. All authors prepare the manuscript and agree for this final version of manuscript to be submitted to this journal.

FUNDING

None.

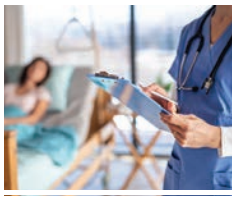


Notes:
A-B-C = airway, breathing, and circulation
Laboratory Test/supportive examination to determine organ function
* Assessment clinical Status refer in hemodynamic status can be seen at Table 4
** Crystalloid fluid resuscitation (or colloid) maximum 20-40 mL/kg or 40-60 mL/kg at hospital that had hemodynamic monitoring device

Figure 7. Management of dengue shock syndrome.[1,2]

CONFLICT OF INTEREST

No conflict of interest.



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