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Management of Dengue Fever

Dengue infection is the fastest emerging arboviral infection according to the World Health Organization (WHO) of the Western Pacific Region (WPRO) in 2015. It is estimated that 2.5 billion of the world's population is at risk of dengue infection. Among these groups who at risk, >70% reside in the Asia Pacific countries with 124 countries being endemic.

In Malaysia , after 3 years of Covid 19 pandemic , dengue has returned with rage. Cases of dengue has recorded a 200% increase compared to the same period of time in March 2023, with the total cumulative cases registered now being 31,111 cases as of 9/4/2023 with 18 mortalities being recorded.

Hence it is important for clinicians of every discipline at all levels (primary to tertiary) to be aware of the presentations, investigations, management and notification process of dengue infection.

The spectrum of dengue infection include the Febrile phase (usually presented with acute high fever, associated with nausea, vomiting, diarrhea, myalgia and occasionally confusion, seizures, abdominal pain and bleeding tendency).

The Critical phase (associated with a reduction of temperature and presents with plasma leakage which lasts usually 24-48 hours) and Recovery phase (reabsorption phase with a gradual recovery of all clinical and laboratory parameters).

The incubation period for dengue infection is 4-7 days (range 3-14).

Dengue infection with warning signs (abdominal pain and tenderness, persistent vomiting, pleural effusion with ascitis, mucosal bleed, lethargy and tender hepatomegaly associated with increasing hematocrit (HCT) with reducing platelet trend) has a higher risk to develop severe dengue (shock, severe bleeding and organ impairment).

Hence these patients need to be admitted to hospital for proper monitoring and management.

In patients with co-morbidities, like congestive heart failure, chronic kidney diseases, and conditions which may need proper monitoring for fluid therapy, need to be admitted as early as possible too. Pregnancy and patients with obesity will be encouraged to be admitted early to hospital for management as well.

Diagnosis of dengue with rapid test (rapid NS1 antigen test/ rapid dengue Ig G/ Ig M test/ rapid combo test) is encouraged as this will lead to better notification and a prevention program with better clinical management of patients. Full blood count alone cannot rule out dengue infection as the total white count will be normal in first two days of fever. In severe dengue, renal function and liver function also needs to be monitored.

Fluid therapy is the mainstay of management for dengue infection. For patients with dengue infection without co-morbidities and who are able to tolerate oral fluid, 2-3 L /day of oral fluid is encouraged. If the patient has warning signs with clinical evidence of plasma leakage, intravenous fluids need to be given. Crystalloids will be the choice of fluid therapy with a maintenance drip as calculated from body weight (adjusted body weight for obese patient) with 1.2-1.5ml/kg/hour. Occasionally, 1.5-2X maintenance IV fluid needs to be given in patients who persistently show signs of plasma leakage. In order not to under volume / over load the patient, frequent adjustment of the IV drip rate needs to be done 4-6 hourly in the critical phase. Proper monitoring of the patient needs to be done with clinical observation, guided by laboratory findings (HCT/ HCo3 and lactate) and a review of the total input of fluid and output of urine regularly. The Critical phase lasts for 24-48 hours only; most of these patients will feel better after the IV drip has been initiated. The IV drip needs to be stopped when the Recovery phase has started.

Recognition of severe dengue from clinical signs and symptoms, frequent vital signs monitoring and vigilant charting of fluid intake either orally or by intravenous fluid therapy associated with proper urine output, supported by laboratory monitoring on HCT level , presence of metabolic acidosis and lactate

level will avoid the occurrence of dengue shock syndrome which will lead to a higher mortality rate.

In recent years, there are cases with severe dengue infection involving organ impairment. Dengue cardiomyopathy and myocarditis has been reported. Dengue with acute liver failure and dengue encephalitis has been reported as well. Currently there is also dengue infection complicating underlying medical illness such as chronic kidney disease, congestive cardiac failure and chronic liver disease population, with fluid restriction imposing a very challenging measure in the management of fluid balance.

Since at the present moment , dengue infection has no antiviral. Therefore prevention is always better than cure. The 4S strategy in dengue prevention include, **Search and destroy mosquito breeding places; Seek early consultation from health experts; Secure self-protection; and Support fogging/spraying**.

However a better way of prevention would be vaccination. At the present moment , there is a new live attenuated dengue tetravalent vaccine using Den 2 as a backbone that has been approved in Brazil and some other countries. The approval for this was based on Phase 1, 2 and 3 trials with more than 28,000 children and adults, including four and a half years of follow-up data from the global, pivotal Phase 3 tetravalent immunization against dengue efficacy study (TIDES) trial.