Improvement of Case-Management - A Key Factor to Reduce Case-Fatality Rate of Dengue Haemorrhagic Fever in Southern Viet Nam

by

Nguyen Thanh Hung* and Nguyen Trong Lan

Department of Dengue Haemorrhagic Fever, Children's Hospital N.1, 341 Su Van Hanh St., Dist 10, Ho Chi Minh City, Viet Nam

Abstract

Dengue haemorrhagic fever (DHF) is a leading cause of hospitalization and death in children in Viet Nam since 1960. This paper emphasizes on the measures taken to improve case management of DHF/dengue shock syndrome (DSS) patients in the country - to reduce the case-fatality rate (CFR) of the disease. These included early diagnosis, correct treatment, and careful monitoring of DHF/DSS patients, as well as counseling mothers/caretakers on measures to take care of DHF patients at home in order to detect warning signs of shock and early admission. These measures had a dramatic effect on reducing the mortality among DHF patients from 8.26% during the period from 1964 to 1974 to 0.26% during the period from 1996 to 2000. CFR of DSS also reduced to between 1.44 and 2% during 1999-2001.

Keywords: DHF/DSS, case-fatality rate, case management, Viet Nam.

Introduction

Dengue haemorrhagic fever (DHF) has emerged as a major public health problem in Viet Nam since 1960. It is a leading cause of hospitalization and death in children (1). In 1998, a widespread DHF epidemic affected 51 out of 67 provinces of the country with 234,866 cases and 383 deaths. Reducing the mortality being the primary objective of the DHF Control Programme (2), a number of measures were taken to improve case management of DHF/dengue shock syndrome (DSS) patients by the medical staff at all levels of the health care system. These included early diagnosis, correct treatment and careful monitoring of DHF/DSS patients, as well as counselling mothers/caretakers on how to take care of DHF patients at home in order to detect the warning signs of shock for early admission (3).

* For correspondence: hungdhf@hcm.fpt.vn
This paper outlines the impact the above-mentioned measures have made on reducing the case-mortality rate of the disease over the last 20 years in Southern Viet Nam.

**Elements of improved case management of DHF/DSS patients**

**Early diagnosis**

Two main pathophysiological changes occur in DHF: (i) increased vascular permeability resulting in plasma leakage, haemococoncentration, hypovolemia and shock; and (ii) abnormal haemostasis due to vasculopathy, thrombocytopenia and disseminated intravascular coagulopathy (DIC), leading to various haemorrhagic manifestations\(^{(4)}\). These are the scientific bases for WHO’s clinical diagnostic criteria\(^{(4)}\). To strictly follow WHO’s criteria, early diagnosis of DHF can be made before most patients reach the critical stage of shock. Early clinical diagnosis of DHF is confirmed by serological tests and/or virus isolation or RT-PCR. This approach met a success rate of 90.6% and 96.2% of the total DHF and DSS cases, respectively, at the Children’s Hospital N.1, Ho Chi Minh City\(^{(5,6)}\). A child having fever for two or more days should alert a clinician to make an early diagnosis of DHF, and this practice proves to be a good management tool before the patient goes into shock.

**Management of DHF/DSS patients**

Replacement of plasma loss received the highest priority in the management of DHF/DSS (Figure 1). It should be borne in mind that not all DHF patients need intravenous (IV) fluid replacement. Patients with non-shock DHF can be managed as outpatients and followed closely everyday from day 3 onwards of their illness, until they are afebrile for more than 48 hours without the use of antipyretics. In these patients, oral rehydration can be achieved by encouraging the child to drink fluids such as oral rehydration solution (ORS), fruit juice and plain water as much as possible. The mothers/caretakers should be advised on how to care for the child at home, and how to recognize the warning signs of shock in order to bring the child back to the nearest hospital in case of emergency. IV fluid therapy in the hospital is necessary in about one-third of the non-shock DHF patients. When these patients have one or more of the following signs/symptoms, IV fluid therapy with the isotonic crystalloid fluids (physiological saline, Ringer’s lactate) should be indicated:

- Repeated vomiting
- Acute, severe abdominal pain; rapid liver enlargement
- Haematemesis, melaena, frank gingival bleeding, severe epistaxis
- Lethargy
- Cold extremities and rapid pulse
- High degree of haemococoncentration, rapidly rising haematocrit.

Early volume replacement of lost plasma by IV fluid therapy in these patients can modify the severity of the disease\(^{(5)}\).
For patients with DSS, early detection of shock, proper treatment and careful monitoring are of vital importance. DSS patients should be admitted immediately to an emergency/intensive care ward. Prompt and adequate fluid resuscitation is the basic treatment for DSS. The recommended regimen for the treatment of DSS patients is as follows:

- Immediate and rapid replacement of the plasma loss with crystalloid or, in the case of profound shock, colloid solutions.
- Continued replacement of further plasma losses to maintain effective circulation for 24-48 hours.
- Correction of metabolic and electrolyte disturbances.
- Blood transfusion – only to cases with severe bleeding.

Careful monitoring of DHF/DSS patients, a mandatory requirement

DHF/DSS patients should be kept under constant and careful observation round the clock by medical staff (both doctors and nurses) in order to detect early and treat correctly the patients with impending shock as well as severe complications such as recurrent shock, massive bleeding, fluid overload, fulminant hepatitis and dengue encephalopathy.

Measures taken to improve DHF/DSS case management in Southern Viet Nam

The key measures taken to improve DHF/DSS case management in Southern Viet Nam during the past 20 years are:
(i) Development of guidelines on standard case management of DHF/DSS; and (ii) Training of the medical staff at all levels of the health care system on the standard case management.

Development of guidelines on standard case management of DHF/DSS

Following WHO’s guidelines and results of the clinical research on DHF as well as the experience gained by clinicians in case management in Southern Viet Nam, we have developed guidelines on standard case management of DHF/DSS for staff at all the health care levels, especially the management of severe DHF/DSS with complications. The management of DHF/DSS is more challenging in:

- Patients with severe complications (prolonged shock; massive bleeding; respiratory failure; fulminant hepatitis; dengue encephalopathy).
- High risk patients:
  - Infants < 1 year.
  - Children and adults with underlying diseases (heart, kidney diseases; G6-PD deficiency; thalassemia; asthma; pneumonia).

Training medical staff at all levels of the health care system on standard case management

Trainers

Training of trainers has been organized and on-site intervention teams have been set up in provincial and referral hospitals. Figure 2 illustrates the training activities in the referral hospitals (Children’s Hospital N.1 and 2; Hospital for Tropical Disease - Ho Chi Minh City) down to provincial and district hospitals and finally to commune health centres in Southern Viet Nam. An important training activity, which should be stressed, is the training of trainers to train staff in provincial and district hospitals.

Figure 2. Training activities on DHF/DSS management for all levels of health care system in Southern Viet Nam

- Conferences on DHF
- Training courses for doctors, nurses
- Training of trainers
- Training health care workers, medical staffs, private physicians
- Health education for mothers

Trainees

Training on DHF/DSS case management has been organized for medical staff (physicians, nurses, medical students, health workers) at all levels of the health care system. Health education on DHF for mothers/caretakers is also focused.

Frequency of training courses

Training activities have been organized continuously every year before, during and after the outbreak of DHF. A hotline has been set up to connect all the health care facilities by telephone, fax and e-mail in order to exchange information and experience on DHF/DSS case management.

Impact of improved DHF/DSS case management

Improvement in the case management of DHF/DSS patients has had a dramatic effect on the case-fatality rate (CFR) in Southern Viet Nam over the last 20 years.

At the Children’s Hospital N.1, Ho Chi Minh City, from 1975 to 1981, there were 1,143 deaths among a total of 29,397 DHF/DSS cases recording a CFR of 3.88% (7). After the implementation of the improved case management system at the Department of Dengue Haemorrhagic Fever, 29,416 DHF/DSS patients have been treated among them there were 8,103 (27.5%) patients with DSS, of whom 73 cases died, thus reducing the CFR to as low as 0.24% during the period from 1991 to 2002. Meanwhile, the CFR of DSS patients was brought down significantly from 12.5% in 1975 to 5.4% in 1986, and to 0.5-1.4% during the period 1991 to 2002.

In Southern Viet Nam, 25,289 DHF/DSS patients with 2,090 deaths were reported from 1964 to 1974, recording a high CFR of 8.26% (1). Since 1976 up to now, outbreaks of DHF have occurred with thousands of cases reported each year. In the peak outbreak of DHF in 1998, there were 119,429 cases of DHF with 342 deaths reported in 19 provinces of Southern Viet Nam. With the improvement of case management of DHF/DSS patients at all levels of the health care system, the CFR of DHF has been reduced significantly to 0.26% during 1996-2001; and that of DSS to 1.44-2% during 1999-2001 (2).

References