Dengue Shock Syndrome - A Case Report

Sharmila Nirojini P, Durga V*, Dahlia Dixcy S, Bharathi J, Asifa Shaz A, Anjana AG

Department of Pharmacy Practice, Swamy Vivekanandha College of Pharmacy, Elayampalayam, Tiruchengode, Namakkal, Tamil Nadu, INDIA.

ABSTRACT

Dengue shock syndrome is the terrible form of dengue infection. The people with defective immune system or with persistent dengue infection are more likely to develop shock syndrome at higher risk. Initial warning sign of severe dengue is gradual fall in body temperature, it is wrong sign of recovery from infection but the patient should feel retrieval from illness. This form of dengue, progressively cause complication in multiple organ and rapidly leads to death. To avoid this life-threatening condition such patient must need admission in hospital to manage this ailment. Early identification and treatment may reduce mortality in patient with dengue shock syndrome.

Keywords: Severe dengue, Phases of dengue, Plasma leakage, Shock, Platelet transfusion.

INTRODUCTION

Dengue virus spreads in human by the bite of infected female *Aedes aegypti* mosquitoes which is domestic tropical mosquito belongs to the family of *Flaviviridae*.[1] It has ability to transmit infection in very short duration of time in many persons because it suck blood with a small bite then instantly shift to another or same person to restart sucking, the infection invade the person even if the vector not sucking the blood.[2] In worldwide nearly 100 million newly identified cases were reported in tropical and sub-tropical regions each year.[1] Dengue classified according to WHO classification ranges from febrile phase (2–7 days) which is asymptomatic or mildly symptomatic, dengue fever (DENV) with development of critical phase (24–48 hr) which is dengue hemorrhagic fever (DHF, grade I and II according to severity) with severe plasma leakage lead to dengue shock syndrome (DSS, grade III and IV according to severity) which is life threatening condition.[3-4] We presented a case report of the patient diagnosed with Dengue shock syndrome (DSS).

CASE REPORT

A 38 years old male was received in Emergency medicine. He had history with the complaints of fever 5 days back, cough with expectoration of sputum from past 4 days. He also suffered with nausea, 6-7 episodes of loose stools, burning micturation, diffuse abdominal pain and discomfort from past 3 days. In physical examination he was conscious, oriented, afebrile and vitals showed that hypotension (BP: 90/60 mm Hg), oxygen saturation (SPO2; 98%), pulse rate (90beats/min), respiratory rate (22 breath/min), temperature (94.5°F). Systemic examination revealed that diffuse abdominal tenderness with bowel sound; CVS, CNS, respiratory system were found to be normal. He was infused with Ringer lactate 500ml (150ml/hr), Inj. Noradrenalin (15ml), Inj. Pantoprazole (40mg), Inj. Ondansetron (4mg), Inj. Hydrocortisone (100mg), Inj. Isopar (1g) immediately on flow. The sample of urine and blood were sent to investigate haematology, biochemistry- liver function, urine analysis, bacterial culture, arterial blood gas and antigen antibody testing. In addition to that CT-Chest and Abdomen imaging

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Address for correspondence:
Ms. Durga V,
Pharm. D - Intern,
Department of Pharmacy Practice, Swamy Vivekanandha College of Pharmacy,
Elayampalayam,
Tiruchengode-635207,
Namakkal, Tamil Nadu, INDIA.
Email id: durgapandian698@gmail.com

www.ijopp.org

were taken. Second dose of Inj. Noradrenalin 15ml given with interval of 30 min from first dose, continuously re-administer two more dose with same time interval than 15ml was reduced to 1ml for next 2 doses with same time interval. Totally 6 dose of Inj. Noradrenalin was administered to the patient as a first-line therapy to improve BP, Intravenous infusion of Ringer lactate 150ml/hr was on flow, Inj. Meropenam (1g) and Inj. Tramadol (50mg) was started intravenously every 8 hr. Finally Noradrenalin was stopped with 140/90 of blood pressure. The patient was advised to admit in hospital for further treatment. Catheterization was done to drain urine out from bladder. From the above mentioned investigational reports revealed that decreased platelet count (0.20 lakhs/mm^3) [Table 1], increased packed cell volume (55.7%) [Table 1], increased RBC (5.58 million cells/mm^3) [Table 1], increased Haemoglobin (17.6 gm/dl) [Table 1], blood group and rheumatoid factor (RH) type were found to be 'O' positive, increased blood urea (60 mg/dl), increased SGOT (199U/L) [Table 1], increased SGPT (114 U/L) [Table 1], total protein (4.8 gm/dl) [Table 1], serum albumin (2.6 gm/dl) [Table 1], urine albumin was positive and NS1 antigen positive. CT-chest report showed that bilateral pleural effusion, few linear atelectasis in right lower lobe, two small peripheral nodules in left lower lateral basal segment. CT-abdomen report shows that acute enlarged pancrease, mild diffuse gall bladder wall thickening, mild central periportal edema, mild ascites, bilateral moderate pleural effusion. From the above-mentioned reports, it is confirmed that the patient diagnosed with Dengue shock syndrome.

On day-2 patient shifted to ICU, vitals were stable and planned for platelet transfusion, Inj. Albumin 20ml/hr on flow, Inj. Cysteine (1gm) was given intravenously every 8 hr and rest of the day-1 drugs were continued. 2 unit of platelet transfusion was done on day-2, 3 and 4. Platelet count was monitored periodically which shows gradual improvement [Table 1]. On day-3 Inj. Refervit 1 amp in 100 ml normal saline was given once a day and rest of the day-2 drugs were continued. On day-4 Inj. Texakind 500mg given as IV every 8 hr and rest of the day-3 drugs were continued. On day-5 patient switched from NPO to liquid diet, patient with complaints of malena and day-4 treatment was continued. On day-6 catheter was removed and patient shifted to ward with same treatment order. On day-7 switched from NPO liquid diet to soft diet, all day-6 drugs were stopped and Tab. Pantoprazole 40 mg (BD), Tab. Enzar forte (BD), T. Emset 4 mg (BD) were given. On day-8 patient advised to discharge after screening of patient's haematology and day-7 treatment order was continued. Finally, the patient discharged on day-9 with Tab. Enzar forte 650mg (BD), T. Sompraz 40mg (BD) were prescribed for 7 days and patient advised to review after 5 days from discharge.

DISCUSSION

The patients with DSS facing nonspecific integral clinical manifestation for a couple of days and followed by unexpected worsening in patient's condition. It includes sudden fall in temperature, pulse rate becomes accelerated and weak. The patient's skin appeared to be dotted, chills and circumoral cyanosis in some patients were observed. At first, the patients become lethargic and appeared to be restless then immediately fall into critical phase which is dengue shock. That patient may reveals with diffuse abdominal pain and tenderness presently before the onset of shock.[2] Some patients with sudden fall in circulation due to decreased volume

Table 1: Represent the laboratory investigational value monitored periodically.

Sl. no	Lab parameter	Investigated value							Normal value
		Day-1	Day-2	Day-4	Day-5	Day-6	Day-8	Day-9	
1.	RBC	5.58	5.13	4.53	4.43	4.42	4.28	4.37	4.5-5.5 million cells/mm^3
2.	Haemoglobin	17.6	16.1	14	13.9	13.3	13.3	13.7	13-17 g/dl
3.	PCV	55.7	50.6	44.8	43.5	42.1	42.3	43.2	40-50 %
4.	WBC	4,100	3,900	6,600	7,100	6,400	4,400	5,000	4,000-11,000 cells/mm^3
5.	Platelet	0.20	0.19	0.13	0.29	0.57	0.76	0.88	1.40-4.50 lakhs/mm^3
6.	SGOT	199	-	165	-	-	-	-	upto 40 U/L
7.	SGPT	114	-	80	-	-	-	-	upto 65 U/L
8.	Amylase	133	-	202	-	-	150	-	40-140 U/L
9.	Lipase	218	-	361	-	-	180	-	0-160 U/L
10.	Total protein	4.8	-	1.3	-	-	-	-	6.3-8.2 gm/dl
11.	Serum Albumin	2.6	-	3.0	2.6	-	-	-	3.5-5 gm/dl
12.	PT- time	-	-	-	15.6	-	-	-	11-14 sec

* indicates elevated from normal * indicates decreased from normal

of intravascular fluid, depletion in blood pressure and changes in mental status. Severe plasma leakage and abnormal bleeding can lead to shock, organ failure and death. Due to this complications, it is crucial to diagnose dengue only with biological samples.[5] so, the imaging study also necessary for confirmatory evaluation and to identify the severity of disease. The investigational report showed that increased hemoconcentrations [Table 1], thrombocytopenia [Table 1], prolonged prothrombin time (PT) [Table 1], hypoproteinemia [Table 1], hypoalbuminemia [Table 1], excessive peritoneal fluid, hepatomegaly, pancreatitis, pleural effusion, increased level of SGOT or SGPT [Table 1] and positive dengue antigen and symptoms of nausea/vomiting, pain in abdomen are indications of DSS.[3] Management of dengue infection is important and there is no specific antibiotic treatment for this dengue virus.[5] Appropriate replacement of intravenous fluid and oxygen should support improvement in critical phase of patient for 48-72 hr.[6-7] Initial therapy of Ringer's lactate solution of 10-15 ml per kg of body weight of patient for one hour followed by 45-50 ml per kg of less concentrated another electrolyte replenishing solution (normal saline) is infused to expanding volume of circulation.[7] During the infusion time of replenishing solution, the Hct value decreased continuously from higher value to reaches the normal which shows improvement in patients condition but the value unchanged or shows further increment which indicate fluid loss into extracellular spaces leads to pulmonary edema, in such case plasma should be transfused at a rate of 10-20 ml per kg for a hour to avoid this drop of circulating blood volume. In DSS during illness their may be an occurrence of bleeding due to thrombocytopenia is the most common cause at any time in such case platelet concentrate transfusion has been done.[6-7] Platelet transfusion is not a specific treatment, it is supportive management of severe dengue.[4] The liver enzyme level, blood parameters, vitals were monitored frequently to progress patient's condition.[6] Critical phase end with the gradual falls in excessive abdominal fluid and pleural effusion after 12-24 hr when the plasma leakage is stopped, the patient enters into third phase which is convalescent phase (2–7 days) of dengue fever. In this phase, hemodynamic and hematocrit stabilization, rise in WBC value, the time greater than 30 hr after shock and greater than 60 hr after plasma leakage the IV line was stopped followed by recovery of patient with gradual improvement in platelet count and symptomatic relief of the patient.[4]

CONCLUSION

The case report demonstrate that in spite of patient admitted and diagnosed in critical phase of dengue, the pharmacological management especially adjuvant therapy is effective and shows significant clinical improvement in this patient from dengue shock. The adequate and appropriate time of therapy may diminish the risk of mortality in this patient.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

BD: Bis in Die; **BP:** Blood Pressure; **CNS:** Central Nervous System; **CT:** Computerized Tomography; **CVS:** Cardio Vascular System; **Hct:** Haematocrit; **ICU:** Intensive Care Unit; **IV:** Intravenous; **NPO:** Nothing Per Oral; **NS1:** Non-Structural protein 1; **OD:** Once Daily; **PCV:** Packed Cell Volume; **PT-Time:** Prothrombin-Time; **RBC:** Red Blood Cell; **SGOT:** Serum Glutamic Oxaloacetic Transaminase; **SGPT:** Serum Glutamic Pyruvic Transaminase; **WBC:** White Blood Cell; **WHO:** World Health Organization.

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