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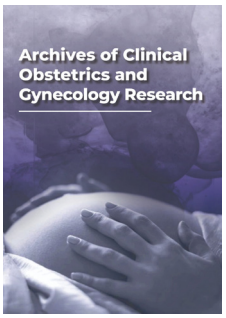
Case Report



Survivor of maternal dengue shock syndrome with acute fulminant liver failure following liver dialysis

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Abstract

This case report describes a pregnant patient who had dengue shock syndrome at 33 weeks gestation. The patient manifested with fever and vomiting and her NS 1 Antigen for dengue was positive. Her platelet dropped dramatically and she went into labour and delivered a fresh still birth baby due to congenital. Her condition deterred after delivery where she became severely jaundice and went into hepatic encephalopathy and liver failure following dengue infection. To prevent maternal mortality , she was electively intubated and liver dialysis was performed of which patient's clinical condition improved dramatically and managed to survive.

Case report

A 33 -year - old Gravida 4 para 3 at 33 weeks gestation with underlying Diabetes Mellitus for 8 years presented with history of fever for two days with vomiting. She lived in dengue endemic area. She was pink, normotensive but febrile with temperature of 38 degrees. Clinically she had mild contraction and clinical palpation revealed uterus at 34 weeks size with cephalic presentation, but it was not engaged. Her cervical os was 3 cm dilated. Her NS1 Antigen for dengue infection was positive. Baseline platelet was 220 x 10^9 but her liver function test were impaired with aspartate transaminase (AST) level of 413 U/L, and serum lactate dehydrogenase (LDH) of 445 U/L. She was mildly acidotic with lactate level of 3 mmol/L. Hence she was treated with dengue fever and managed in high dependency ward (HDW). N aceytylcystine (NAC) was given intravenously for her transaminitis. Unfortunately on day 3 of fever, her labour progressed to os 4cm. Her platelet dropped to 100 x 10^9. She was transfused with 4 units of platelet intrapartum and delivered vaginally to a baby boy 3 hours later. She did not develop postpartum haemorrhage but her baby was born with very poor Apgar Score and intubated at birth. The baby died at day 7 of life secondary to congenital dengue. On day 1 postpartum at day 4 of dengue fever, patient's condition deterred despite she completed the critical phase of dengue for 48 hours. She developed atrial fibrillation, hypotension and warning sign of haemoconcentration which was third space fluid loss with presence of bilateral pleural effusion and ascites. Her platelet dropped to 51 x 10^9 , and she went into fulminant liver failure despite on intravenous NAC. Her alanine transaminase (ALT) raised to 2000 U/L and LDH to 5517 U/L. Her acidosis worsened with base excess level of -12.1 and serum lactate of 11 mmol/L. Bedside echo revealed myocardial dysfunction with ejection fraction of 40%. Urgent full blood picture revealed neutrophilia monocytosis with no evidence of haemolysis. She was started on amiodarone for her atrial fibrillation , thiamine for the liver failure and continuos renal replacement therapy (CRRT) for her worsening metabolic acidosis. Unfortunately she developed cardiogenic shock, requiring two inotropes- dobutamine and noradrenaline on day 5 of illness and was electively intubated for hepatic encephalopathy as her ALT abruptly increased to 9000 U/L, AST of 4555 U/L and serum ammonia of 300 mmol/L on day 6 of illness. Decision of liver dialysis was then made by Intensivist Consultant. Patient had 3 cycles of Molecular Adsorbent Recirculating System (MARS) or liver dialysis also on day 6 of illness of which her lactate, AST, ALT and serum ammonia gradually reduced, to 300 U/L, 200 U/L and 100 U/L respectively before she was extubated on day 16 of illness. She was on regular physiotherapy under Rehabilitation team in obstetric ward to improve her muscle weakness and was discharged well 2 weeks later (Table 1 and Figure 1).

Discussion

Pregnancy liver disorder has been associated with 20% mortality [2]. The main cause of liver failure in pregnancy are Haemolytic Elevated Liver Enzyme and Low Platelet (HELLP syndrome), acute fatty liver [3] and hepatitis E. The first case of MARS in pregnancy was reported in 2008 secondary due to acute fatty liver [4]. This is the first case reported of MARS in pregnancy in relation to dengue shock syndrome (DSS) in our hospital. DSS causing fulminant liver failure has been reported to cause 50 % mortality in children [5]. Dengue is an arborviral infection transmitted by mosquito Aedes and unlike other viral hepatitis, the AST level tends to be higher than ALT due to damage of myocytes during dengue infection and peak at day 7 to 8 of illness [6]. In Malaysia, the highest AST level before liver dialysis was subjected was > 1000 U/L, [7] but as for this patient the level was 9x higher (9130 U/L) of which grade 3-4 hepatic encephalopathy is actually a criteria for liver transplant.

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Table 1. *Clinical Practice Guidelines, Management of Dengue Infection in Adults 3rd edition, 2015 [1].*

Day of Illness	D2 NAC	D3 SVD in ICU A/S 0/0/T	D5 CPAP, CCRT & Thiamine	D6 Intubated, Digoxin & Ist MARS started	D8 AF Resolved 3rd MARS completed	D16 Extubated
TWC	7.4	12.5	37.3	45.9	13.6	4.7
Hb	11.8	14.1	13.6	11.3	8.1	9.6
Platelet	220	61	51	93	216	300
AST	413	1105	5671	9130	5498	200
ALT	117	476	2533	4555	1986	44
LDH	495	722	5577	8165	3843	500
Bilirubin	46	85.4	219	231	116	86
Ammonia	-	265	301	997	165	79
pH	7.44	7.3	7.36	7.32	7.45	7.43
Base excess	-8.6	-15.8	-12.6	-17.2	-4.2	3.4
Lactate	2.7	5.5	13.2	13.8	7.9	0.9
Urea	1.9	2.9	5	6.7	6.0	3.6
Creatinine	51.4	59.7	85.6	89.1	70.5	42.6
APTT	48.1	51.2	47.4	40.7	38.4	39.3
INR	1.19	1.26	1.61	2.27	2.01	0.89

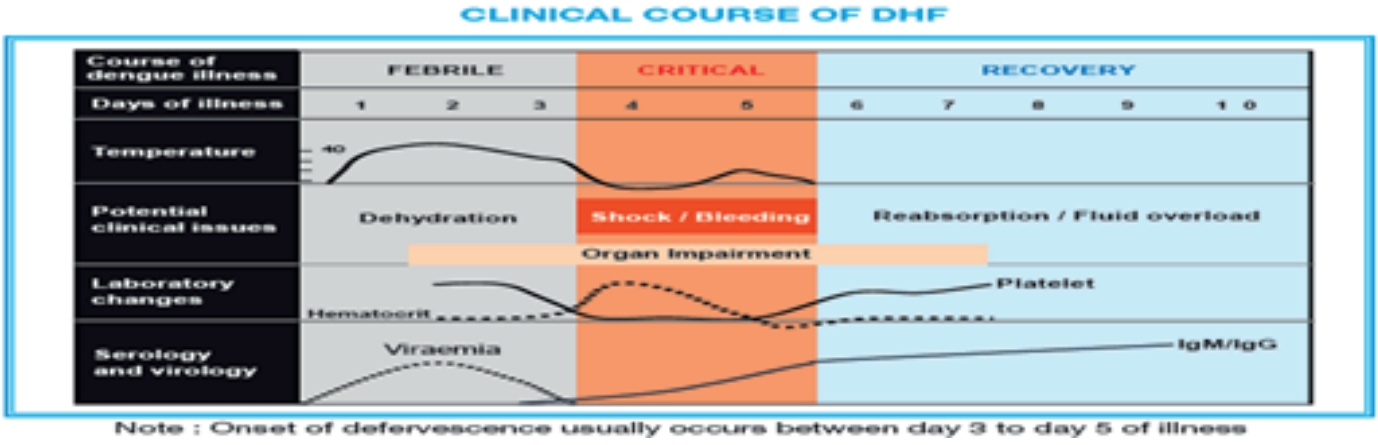

Figure 1. *Clinical course of DHF.*

Conclusion

MARS function based on concept of albumin dialysis, removing water soluble and albumin bound toxin [8] and this case revealed that MARS is safe and efficient as lifesaving treatment for fulminant hepatic failure.

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