

Severe Adult Dengue Cases admitted to the Intensive Care Unit in 2015- A Single-Centre Experience, Singapore

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Background

Singapore anticipates a record high number of dengue cases in 2016. Severe dengue due to plasma leakage, dengue hemorrhagic fever (DHF) is well recognised.

Limited data suggest contribution of advanced age and comorbidities to severe presentation.

Methods

Tan Tock Seng Hospital is a large public acute care hospital with over 1,500 beds, and cared for 1368 dengue patients (dengue NS1+, both outpatients and inpatients) in 2015. For the 539 patients who were managed as inpatients, median age was 45 years (range 16-91).

We performed a retrospective case series/audit of all confirmed dengue (Dengue NS1 positive, PCR positive, compatible clinical presentation) cases admitted to our institution's ICU in 2015. The goal was to identify areas to improve management and processes.

Results

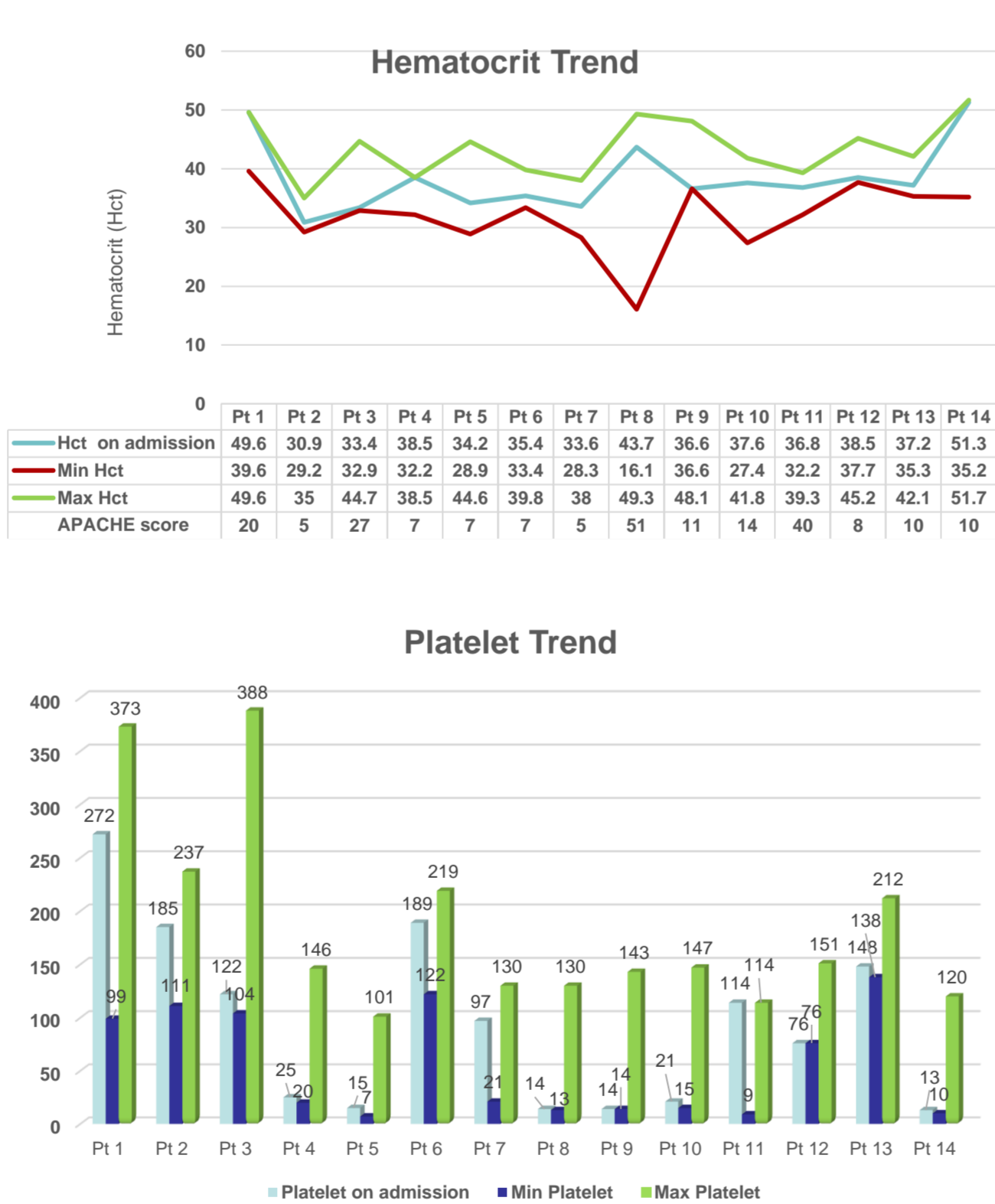
14 adult cases were reviewed; 8 were DENV-2, 5 were DENV-1 and serotype for one case was not typeable. Only one patient had travel history out of Singapore (India).

93% were Dengue IgG negative. The median age was 52 years (range 21-79). Most common presenting symptoms were fever and vomiting. Table 1 shows demographics, comorbidities, selected laboratory results (Figure 1 focuses on haematocrit and platelet trends). Blood cultures were performed in all patients, none had concurrent blood stream infection. 9 of 14 patients had Charlson score of ≤ 1 . Eight patients had visited a general practitioner prior to admission.

Table 1

Variables	N (%)
Gender, Female	8 (57.1%)
Age (median, range), years	52 (21-79)
Ethnicity	
Chinese	10 (71.4%)
Indian	2 (14.3%)
Malay	2 (14.3%)
BMI (data available for 8 patients)	mean: 21.6, median: 21.16, range: 18.4-25.3
Comorbidities	
Diabetes mellitus with chronic complications	2 (14.3%)
Hypertension	5 (35.7%)
IHD	3 (21.4%)
Chronic Liver Disease	1 (7.1%)
Malignancy	1 (7.1%)
AIDS	1 (7.1%)
Myocardial Infarction	3 (21.4%)
Peptic Ulcer Disease	1 (7.1%)
Mild Liver Disease	1 (7.1%)
APACHE- II Score (also see Fig 1)	Median 10 (range 5-51)
Day of Fever on admission to ICU/HD	Median: day 3 (range day 1-6); 10/14 were admitted day 1-3 of fever
Indication of ICU Admission	
Shock	12 (85.7%)
Bleeding	1 (7.1%)
Altered Mental State	1 (7.1%)
Lab results	
Creatinine - Max (Median, range, umol/L)	102.5 (41-387), 8/14 had acute kidney injury
ALT - Max (Median, range, u/L)	146.5 (12-3870)
AST - Max (Median, range, u/L)	240 (21-16596)
Bilirubin - Max (Median, range, umol/L)	20 (5-64)
Albumin - Min (Median, range, g/L)	26 (10-36)
PT - Max (Median, range, s) (n=12)	14.75 (12.1-46.6)
INR - Max (Median, range) (n=12)	1.2 (0.9-5.4)
APTT - Max (Median, range, s) (n=12)	42.8 (29.1-120)
Trop I - Max (Median, range, ug/L)	0.39 (0.01-90), 4 patients (33%) had Trop I > 0.50 ug/L

Figure 1- Hct and Platelet Trends



Patients 2, 5, 8, 11 and 14 had evidence of plasma leakage. Patients 7 and 8 had gastrointestinal (GI) bleeding.

8 required inotropes/vasopressors despite fluid resuscitation (7 dopamine, 3 noradrenaline and 2 vasopressin). 10/14 patients received more than 1 L of crystalloids in the ED, of which 2 received >2.5 L of fluid. Median duration of ICU admission was 3 days (range 2-7).

Results (Cont'd)

Cardiac involvement was seen in 6 patients (dynamic ECG changes, and/or Troponin increase) with median age 42.5 years (range 21-79). Example of dynamic ECG changes can be seen in Figure 2 for patient 10 in case series. 4 of 6 had echocardiography done, 3 patients had depressed systolic function. Thrombocytopenia appeared more severe in those with cardiac involvement compared with those without (mean minimum platelet count 27 vs 74.6 x 10⁹/L).

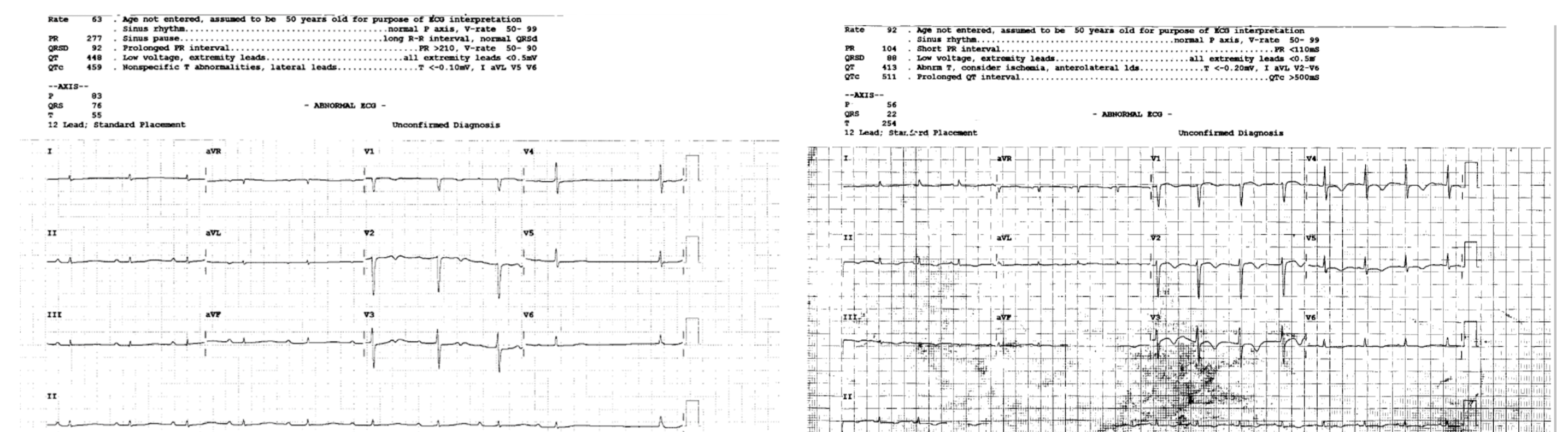


Figure 2- ECG changes patient 10 (left panel; day 4 of admission, right panel; day 7 of admission)

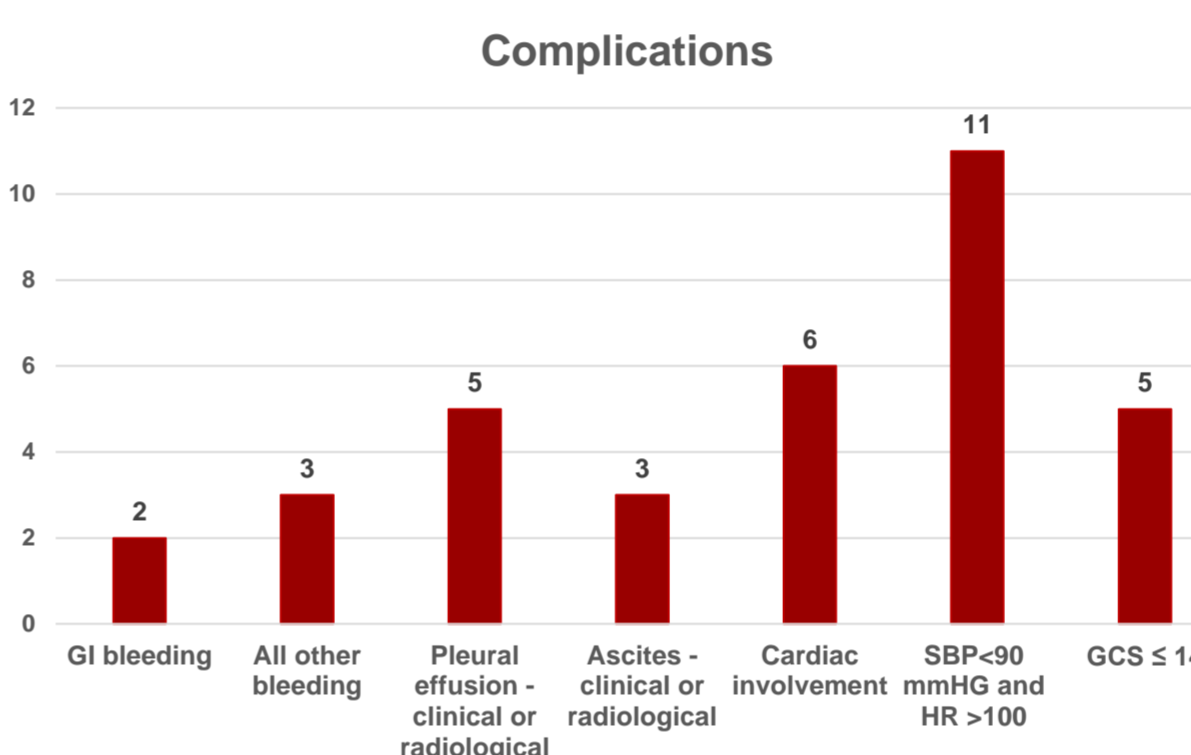


Figure 3- Complications observed in patient series

Figure 3 summarises complications in patient series reviewed. Evidence of plasma leakage was seen in 5 patients; three of whom also had had cardiac involvement. Two patients required mechanical ventilation (patients 1 and 8), and two patients died (patients 8 and 11).

Conclusions

Key observations:

Early presentation of illness and shock in early dengue course requiring inotropes.

Significant number of patients had signs of cardiac involvement (transient depressed myocardial function, electrical abnormalities).

Limited number of patients in our case series had comorbidities.

Shock in early dengue may need to be viewed and managed differently. This will need a multi-disciplinary approach, with appropriate assessment and monitoring (non-invasive methods, echocardiography, cardiac enzymes), judicious and tailored use of fluids and inotropes. Case-control studies are needed to evaluate these observations and various approaches need to be studied via clinical trials.

References

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