

Research Article

A Retrospective Analysis of Outcome in Dengue Patients Admitted into a Multidisciplinary ICU of a Tertiary Care Teaching Hospital

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Abstract: Introduction :World wide dengue has become the most common vector bone tropical fever spread by Aedes Egypti. This virus has four circulating serotypes worldwide. In urban and suburban areas of high endemicity this infection is responsible for high mortality and morbidity. WHO estimates incidence of dengue globally ranges between 50 million to 200 million every year. Dengue fever presentations can vary from fatigability and malaise to severe shock and multiorgan dysfunction syndrome. **Methods** All patients had a full work up for fever that included three smears for malarial parasites, serology for dengue, leptospirosis, scrub typhus, enteric fever, blood, urine, sputum or endotracheal cultures and other tests as clinically indicated. A diagnosis of Dengue was made when a patient is tested positive for NS1-Antigen Strip® ELISA (BioRad), IgM and IgG- Capture ELISA Panbio® (Alere™) and other causes of fever excluded. Patients were treated with Ceftriaxone along with enteral doxycycline and intravenous azithromycin as needed. **Results** Of total patients, the vasopressor requirements being Dopamine (12.9%), Noradrenaline (12.9%) & Vasopressin (3.2%). 1.6% received packed red blood cell transfusions whereas 80.6% had platelet transfusions. 4.8% required non-invasive ventilation whereas 9.7% required invasive mechanical ventilation and 3.2% required both non-invasive and invasive mechanical ventilation. 6.5% of patients had received haemodialysis. The mean duration of ICU and hospital stay were 4.25 and 6.54 days respectively. In-hospital mortality was 1.6%. **Conclusion** In our study we hereby conclude the incidence of clinical features is in agreement with other studies whereas the in-hospital mortality was relatively low.

Keywords: Dengue, Shock, ICU, ARDS, AKI.

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INTRODUCTION:

World-wide dengue has become the most common vector bone tropical fever spread by Aedes Egypti (Murray, N. E. A. *et al.*, 2013; Guzman, M.G. & Harris, E. 2015). This virus has four circulating serotypes worldwide. In urban and suburban areas of high endemicity this infection is responsible for high mortality and morbidity (Anand, A. M. *et al.*, 2016). WHO estimates incidence of dengue globally ranges between 50 million to 200 million every year (Murray, N. E. A. *et al.*, 2013). Dengue fever presentations can vary from fatigability and malaise to severe shock and multiorgan dysfunction syndrome. Out of seven identified countries in south east Asia, India is one of them reporting Dengue fever and Dengue hemorrhagic fever regularly. Even though evolution of illness and dengue prodrome are similar in many patients, progress and outcome differ significantly depending upon severity of illness and also treatment given.

METHODS:

All patients admitted to the multidisciplinary ICU of a tertiary care teaching hospital in South India with acute febrile illness over a one year period (2017 – 2018) were analysed retrospectively.

All patients had a full work up for fever that included three smears for malarial parasites, serology for dengue, leptospirosis, scrub typhus, enteric fever, blood, urine, sputum or endotracheal cultures and other tests as clinically indicated. A diagnosis of Dengue was made when a patient is tested positive for NS1-Antigen Strip® ELISA (BioRad), IgM and IgG- Capture ELISA Panbio® (Alere™) and other causes of fever excluded. Patients were treated with Ceftriaxone along with enteral doxycycline and intravenous azithromycin as needed.

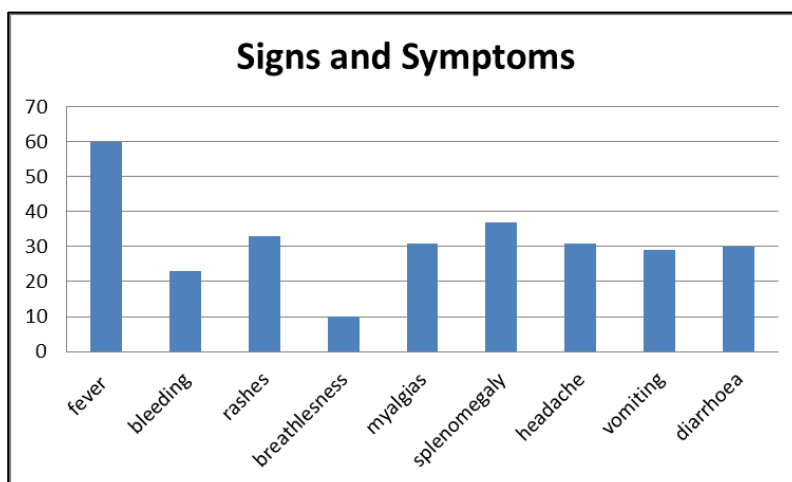
Organ support was provided to patients depending upon the organ dysfunction. Respiratory support includes non-invasive ventilation (NIV) or invasive mechanical ventilation (IMV), cardiovascular support includes vasopressor therapy for patients in shock and renal replacement therapy for those with acute kidney injury.

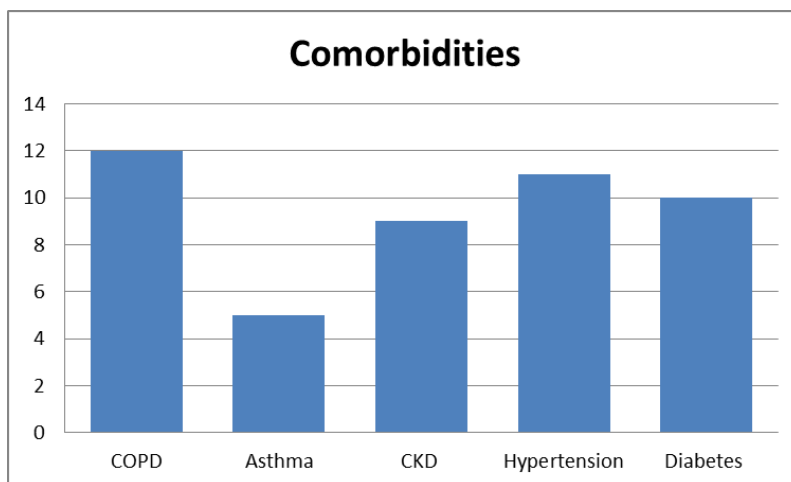
Severity of illness scores (Acute Physiology and Chronic Health Evaluation II, APACHE-II) and Sequential Organ Failure Assessment (SOFA) scores were calculated at admission. The primary outcome of interest was in-hospital mortality. Other outcomes were duration of ICU and hospital stay respectively.

RESULTS

TABLE I. Demographic and clinical profile of patients with dengue

| Variable | n (%) | Mean |
|--------------------------------|------------|-------|
| Total | 62 | |
| Age | | 44.19 |
| Sex | | |
| Male | 35 (56.46) | |
| Female | 27 (43.54) | |
| Symptoms & Signs | | |
| Fever | 60 (96.8) | |
| Bleeding | 23 (37.1) | |
| Rashes | 33 (53.2) | |
| Breathlessness | 10 (16.1) | |
| Myalgias | 31 (50.0) | |
| Splenomegaly | 37 (59.7) | |
| Headache | 31 (50.0) | |
| Vomiting | 29 (46.8) | |
| Diarrhea | 30 (48.4) | |
| Comorbidities | | |
| COPD | 12 (19.4) | |
| Asthma | 5 (8.1) | |
| CKD | 9 (14.5) | |
| Hypertension | 11 (17.7) | |
| Diabetes | 10 (16.1) | |
| Severity illness scores | | |
| APACHE | | 9.90 |
| SOFA | | 6.70 |





Totally, 62 were diagnosed as dengue based on clinical features, a positive IgM ELISA and exclusion of other diagnoses.

Baseline patient characteristics are summarized in table I. Of 62 patients, mean age 44.19 years, 35 (56.46) were male and 27 (43.54) were female. Incidence of symptoms being, fever (96.8%), bleeding (37.1%), rashes

(53.2%), breathlessness (16.1%), myalgias (50%), splenomegaly (59.7%), headache (50%), vomiting (46.8%), diarrhoea (48.4%). The admission APACHE-II and SOFA mean scores were 9.90 & 6.70 respectively.

TABLE II. Laboratory investigations

| Variable | Mean |
|-----------------------|---------------------------|
| Haemoglobin | 14.11 gm/dl |
| Total leucocyte count | 7400.80/mm ³ |
| Platelet count | 0.36 lakh/mm ³ |
| Serum Creatinine | 1.14 mg/dl |
| Serum Sodium | 134.58 meq/l |
| Serum Bicarbonate | 22.45 meq/l |
| Serum Lactate | 1.90 mmol/l |
| Total Bilirubin | 1.79 mg/dl |
| INR | 1.60 |
| PTT | 20.22 sec |
| SGOT | 300.3 IU |
| SGPT | 161.9 IU |

Laboratory analysis was summarized in table II. It showed a mean values of TLC-7400.80 cells/mm³, Platelets – 0.36 lakh/mm³, serum creatinine – 1.14 mg/dl, serum sodium-134.58 meq/l, lactate-1.90 mmol/l, Total Bilirubin – 1.79 mg/dl, INR-1.60, PTT-20.22 sec, SGOT & SGPT were 300.3 IU and 161.9 IU respectively.

TABLE III. Interventions and Outcome

| Variable | n (%) | Mean (number of days) |
|---------------------------------|-----------|-----------------------|
| Vasopressor requirement | | |
| Dopamine | 8 (12.9) | |
| Noradrenaline | 8 (12.9) | |
| Vasopressin | 2 (3.2) | |
| Transfusion requirements | | |
| Packed cells | 1 (1.6) | |
| Platelets | 50 (80.6) | |
| Other supports | | |

| | |
|---------------|---------|
| Haemodialysis | 4 (6.5) |
| NIV | 3 (4.8) |
| IMV | 6 (9.7) |
| Both | 2 (3.2) |

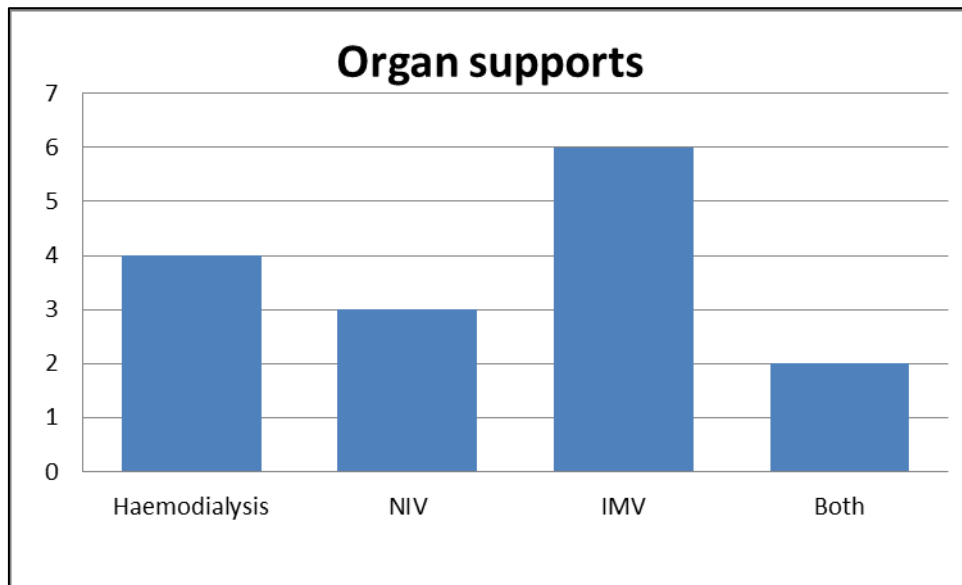
Outcome

Primary

| | |
|-----------|---------|
| Mortality | 1 (1.6) |
|-----------|---------|

Secondary

| | |
|-----------------|------|
| LOS in ICU | 4.25 |
| LOS in Hospital | 6.54 |



Data on interventions & outcome during hospitalization was summarized in table III. Of total patients, the vasopressor requirements being Dopamine(12.9%), Noradrenaline(12.9%) & Vasopressin(3.2%). 1.6% received packed red blood cell transfusions whereas 80.6% had platelet transfusions . 4.8% required Noninvasive ventilation whereas 9.7% required Invasive mechanical ventilation and 3.2% required both non-invasive and invasive mechanical ventilation. 6.5% of patients had received haemodialysis.

The mean duration of ICU and hospital stay were 4.25 and 6.54 days respectively. In hospital mortality was 1.6%.

DISCUSSION

Juneja *et al.* in their prospective study done over 2.5 yrs has reported mean age group as 39.6 yrs (Juneja, D. *et al.*, 2011). Chun *et al.* in their prospective study done with 4787 cases has reported the incidence to be Fever (78.3%), anorexia(32.9%), abdominal pain(32.2%) respectively (Chen, C. M. *et al.*, 2016). Ong *et al.* in their retrospective study done with 3187 cases has reported incidence in mortality associated

group to be minor bleeding(42.9%), Diarrhea(28.6%), headache(14.3%), Abdominal pain (57.1%), Nausea and vomiting(57.1%) (Ong, A. *et al.*, 2007). In our study, of 62 patients, mean age is 44.19 years , 35(56.46) were male and 27 (43.54) were female. Incidence of symptoms being, fever (96.8%), bleeding(37.1%), rashes(53.2%), breathless(16.1%), myalgias(50%), splenomegaly(59.7%), headache(50%), vomiting(46.8%), diarrhoea(48.4%) .

In a retrospective single centered study done by Mahesha Padyana *et al.*, in 96 patients .Median APACHE II score at 24 hours among survivors was 6.0 and non-survivors 17.5 (p <0.01). SOFA score at 48 hours among survivors and non survivors was 6 and 20, respectively (p<0.01), also demonstrated high AST, ALT among non survivors. (Padyana, M. *et al.*, 2019). In our study, the admission APACHE-II and SOFA mean scores were 9.90 & 6.70 respectively.

In a prospective study done by Nayak *et al.*, in 150 patients abnormal AST was seen in 97.33% cases and abnormal ALT was seen in 84% cases thrombocytopenia was seen in all cases with DHF and DSS. (Nayak, J. A. D. U. M. A. N. I. *et al.*, 2017) In our

study, the laboratory analysis showed a mean values of TLC-7400.80cells/mm³, Platelets – 0.36 lakh/mm³, serum creatinine –1.14mg/dl, serum sodium-134.58meq/l, lactate-1.90mmol/l, Total Bilirubin – 1.79mg/dl, INR-1.60, PTT-20.22sec, SGOT & SGPT were 300.3 IU and 161.9 IU respectively.

Padyana *et al.* has retrospectively shown that AKI and moderate to severe ARDS is significantly associated with mortality along with shock and lactates (Padyana, M. *et al.*, 2019). Thanachartwet *et al.* in their prospective study, has shown shock as a significant predictor of mortality (Thanachartwet, V. *et al.*, 2016). Chen *et al.* has retrospectively shown that moderate ARDS, shock and multiorgan failure has significant correlation with mortality.(10) In our study, the vasopressor requirements being Dopamine(12.9%), Nor adrenaline(12.9%) & Vasopressin(3.2%).1.6% received packed red blood cell transfusions whereas 80.6% had platelet transfusions. 4.8% required Non invasive ventilation whereas 9.7% required Invasive mechanical ventilation and 3.2% required both non invasive and invasive mechanical ventilation. 6.5% of patients had received haemodialysis.

Pinto *et al.* has retrospectively reported the mortality to be 3.1% (Pinto, R. C. *et al.*, 2016). Ong *et al.* in their retrospective case-control study has reported the case fatality rate to be 5.4%. (6) In our study, mean duration of ICU and hospital stay were 4.25 and 6.54 days respectively. In hospital mortality was 1.6%.

CONCLUSION

In our study we hereby conclude the incidence of clinical features is in agreement with other studies whereas the in hospital mortality was relatively low.

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