Children with Dengue fever, Dengue haemorrhagic fever and Dengue shock syndrome admitted to Parami General Hospital

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• Dengue is
  ❖ An acute viral infection caused by flavivirus with potential fatal complications.
  ❖ first detected in Myanmar in 1969.
  ❖ Outbreaks have occurred in 3 to 5 year cycles of increasing magnitude since the first recorded outbreak in the country in 1970.
• DHF/DSS is one of the leading cause of morbidity and mortality among children under 15 years
Aim and Objectives

• to determine the epidemiological pattern of children with Dengue Fever (DF), Dengue Haemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) and

• to analyze the treatment and outcome
Method

- Retrospective study of children with DF, DHF and DSS from register, patients’ charts and electronic hospital records
Study period

- From September 2013 to June 2017
- Since Parami General Hospital was established in August 2010, we accepted and managed a total of 3040 dengue cases.
- Period between two expired cases
Inclusion criteria

• Patients with following criteria are included in this study:

✓ Children under 18 years
✓ Fever, or history of acute fever lasting 2-7 days
✓ Hemorrhagic tendencies: a positive tourniquet test
✓ Positive Ns1 Antigen for dengue virus and/or positive dengue specific antibody
Dengue Fever - Dengue virus infection

Dengue fever is most commonly an acute febrile illness defined by the presence of fever and two or more of the following:

- retro-orbital or ocular pain
- headache
- rash
- myalgia
- arthralgia
- leukopenia
- hemorrhagic manifestations (e.g. Positive tourniquet test, petechiae, purpura/ecchymosis, epistaxis, gum bleeding)
Dengue Haemorrhagic fever -(Grade 1 and 2)

✓ Fever lasting from 2-7 days
✓ Evidence of hemorrhagic manifestation or a positive tourniquet test

✓ Thrombocytopenia (platelet count <100,000 cell per mm3)
✓ Evidence of plasma leakage shown by haemoconcentration (an increased in hematocrit >20% above average for age or a decrease in hematocrit >20% of baseline following fluid replacement therapy), or pleural effusion, or ascites or hypoproteinemia.
Dengue shock syndrome (Grade 3 and 4) has all of criteria for DHF plus circulatory failure as evidence by

- Rapid and weak pulse and narrow pulse pressure (<20 mm Hg) or
- Age specific hypotension and cold, clammy skin and restlessness
Results
Distribution of age

- Up to 1 year: 122
- 1-2 years: 53
- 2-3 years: 97
- 3-4 years: 116
- 4-5 years: 139
- 5-6 years: 119
- 6-7 years: 146
- 7-8 years: 153
- 8-9 years: 101
- 9-10 years: 112
- 10-11 years: 104
- 11-12 years: 88
- 12-13 years: 92
- 13-14 years: 49
- 14-15 years: 35
- 15-16 years: 26
- 16-17 years: 5
- 17-18 years: 5

Age in year
Sex distribution

- Male: 713 (45.65%)
- Female: 849 (54.35%)
82.7% of patients positive for NS1 antigen and the remaining cases were diagnosed as they positive for dengue IgM
Classification and grading

- DF: 692 (44.3%)
- Grade I: 412 (26.3%)
- Grade II: 289 (18.5%)
- Grade III/DSS: 169 (10.8%)
Distribution of patients according to prevalence of shock

Non shock: 1393 (89%)
Shock: 169 (11%)

Mean platelets for shock patients = 63.67
Mean platelets for non shock patients= 130.22
Prevalence of Shock among infants and children who were >1 year old

Of total 122 infants – prevalence of shock was 6.6%
Of total 1440 children (>1 year old) – prevalence of shock was 11.2%
75% of non-shock patients were treated with Crystalloid
Of 169 shock patients, 71% were treated successfully with crystalloid only.
Antibiotic usage

<table>
<thead>
<tr>
<th>Indications</th>
<th>Number (%)</th>
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<tbody>
<tr>
<td>ARI</td>
<td>120 (42.7%)</td>
</tr>
<tr>
<td>Peritoneal oozing with peritonitis</td>
<td>2 (0.7%)</td>
</tr>
<tr>
<td>Appendicitis</td>
<td>4 (1.4%)</td>
</tr>
<tr>
<td>Acute GE</td>
<td>7 (2.5%)</td>
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<tr>
<td>Dysentry</td>
<td>7 (2.5%)</td>
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<tr>
<td>Enteric fever</td>
<td>21 (7.5%)</td>
</tr>
<tr>
<td>Cervical lymphadenitis</td>
<td>2 (0.7%)</td>
</tr>
<tr>
<td>Cellulitis</td>
<td>4 (1.4%)</td>
</tr>
<tr>
<td>Skin infection</td>
<td>8 (2.8%)</td>
</tr>
<tr>
<td>Pleural effusion with secondary bacteria infection</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Consolidation of lung</td>
<td>4 (1.4%)</td>
</tr>
<tr>
<td>UTI</td>
<td>7 (2.5%)</td>
</tr>
<tr>
<td>Chicken pox with secondary bacteria infection</td>
<td>1 (0.3%)</td>
</tr>
<tr>
<td>Sepsis (high total WBC and CRP)</td>
<td>7 (2.5%)</td>
</tr>
<tr>
<td>Susceptive bacteria infection</td>
<td>66 (23.5%)</td>
</tr>
<tr>
<td>Others</td>
<td>20 (7.1%)</td>
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</tbody>
</table>
Duration of hospital stay

- 12 Days: 1
- 11 Days: 3
- 10 Days: 7
- 9 Days: 26
- 8 Days: 49
- 7 Days: 132
- 6 Days: 275
- 5 Days: 420
- 4 Days: 500
- 3 Days: 420
- 2 Days: 420
- 1 Day: 149

Frequency
Referral

54 (3.5%) patients were referred to other hospitals
The main reason of referral was Shock

- (61.1% of total 54 referred patients)
- (19.5% of total shock patients)
Distribution of patients by states/divisions

- Mandalay: 1274
- Bago Div: 138
- Yangon Div: 1274
- Ayeyar waddy div: 103
- Nay pyi taw: 1
- Thanin tharyee: 12
- Mon: 17
- Rakhine: 16
Discussion
• A total of **1562** dengue cases were included in this study.

• Infants and 6-8 year old children were common age group

• Male were slightly predominant
• Dengue NS1 antigen was positive in 81.4% of patients.

• Detection of NS1 during the febrile phase of a primary infection may be greater than 90% sensitive however is only 60-80% in subsequent infections.¹

• Test may be negative in the early stage of disease.²

• Dengue virus-specific antibodies, useful in later stage of infection which are produced after 5-7 days.
Graph of when laboratory tests for dengue fever become positive. Day zero refers to the start of symptoms, 1st refers to in those with a primary infection, and 2nd refers to in those with a secondary infection.
• Regarding grading and classification according to WHO classification 1997\(^6\)

  ▪ 44.3% were admitted as dengue fever
  ▪ 55.7% presented as DHF/DSS (26.3%, 18.5% and 10.8% as DHF grade I, Grade II and Shock respectively)
The mainstay of treatment is supportive therapy and close monitoring of warning and vital signs in critical period (between day 2 to day 7).

For severe dengue, replacement of plasma lost due to increased vascular permeability is very important.

Two main types of volume expander are used to replace fluid lost in the management of dengue fever: *crystalloids* and *colloids*. 
• 348 patients (22.3%) needed ORS alone for fluid replacement

• All DSS cases and 75% of non-shock children treated with crystalloid solution

• Nguyen Thanh Hung\(^3\) patients with DSS and the 30% of non-shocked dengue patients required intravenous fluid therapy and the majority of patients with DSS can be treated successfully with isotonic crystalloid solutions
• To revive shock, 71% of cases were successfully treated with crystalloid, only 29% needed colloid.

• Dung NM et al, showed majority of patents with DSS were mild-to-moderate shock and respond well to conventional treatment with crystalloids\textsuperscript{4}.
Antibiotic usage

• Antibiotic treatment is not necessary in dengue infection.

• However, we used antibiotics initially and subsequently in 18% of cases.

• For suspected/confirmed co-infections or treatment of secondary bacteria infections.
Hospital stay

• Duration of hospital stay was vary from 1 to 12 days
• Most patients (68.4%) discharged from hospital within 3 days
Drainage areas

- Although children from various parts of the country came to seek treatment, most patients (81.5%) were from Yangon.

- Bago and Ayeyarwaddy division were the second most common places from which patients came to seek treatment (8.8% and 6.6% respectively).
National figures of 2007 indicated that the largest number of cases are from Yangon division (31%) and Ayeyarwaddy Division (16%) and Mon State (15%) follow second\(^5\)

*Distribution of dengue cases in State and division of Myanmar 2007: Joint plan of action dengue 2008*
Conclusion

• Dengue infection is major health problem among all ages especially infants and young children.

• Early detection, prompt effective treatment and close monitoring is mainstay of treatment

• Regarding fluid replacement, ORS and crystalloid solutions still play important roles.
• Both Rural and Urban area, DHF/DSS is a disease that need to be taken action seriously

• One of the leading cause of admission to our hospital

• Parami General Hospital plays significant role in contribution of health care services to children with DF, DHF and DSS who need close monitoring and meticulous care of IV fluid therapy.
THANK YOU


