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

Dr. Shin Moe Thu

Paediatrician

Parami General Hospital

- Dengue is

  ❖An acute viral infection caused by flavi virus 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 2-7days

  ✓ Hemorhagic tendencies: a positive tourniquet test

  ✓ Positive Ns1 Antigen for dengue virus and/or positive dengue specific antibody

Classification (WHO 1997)

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.
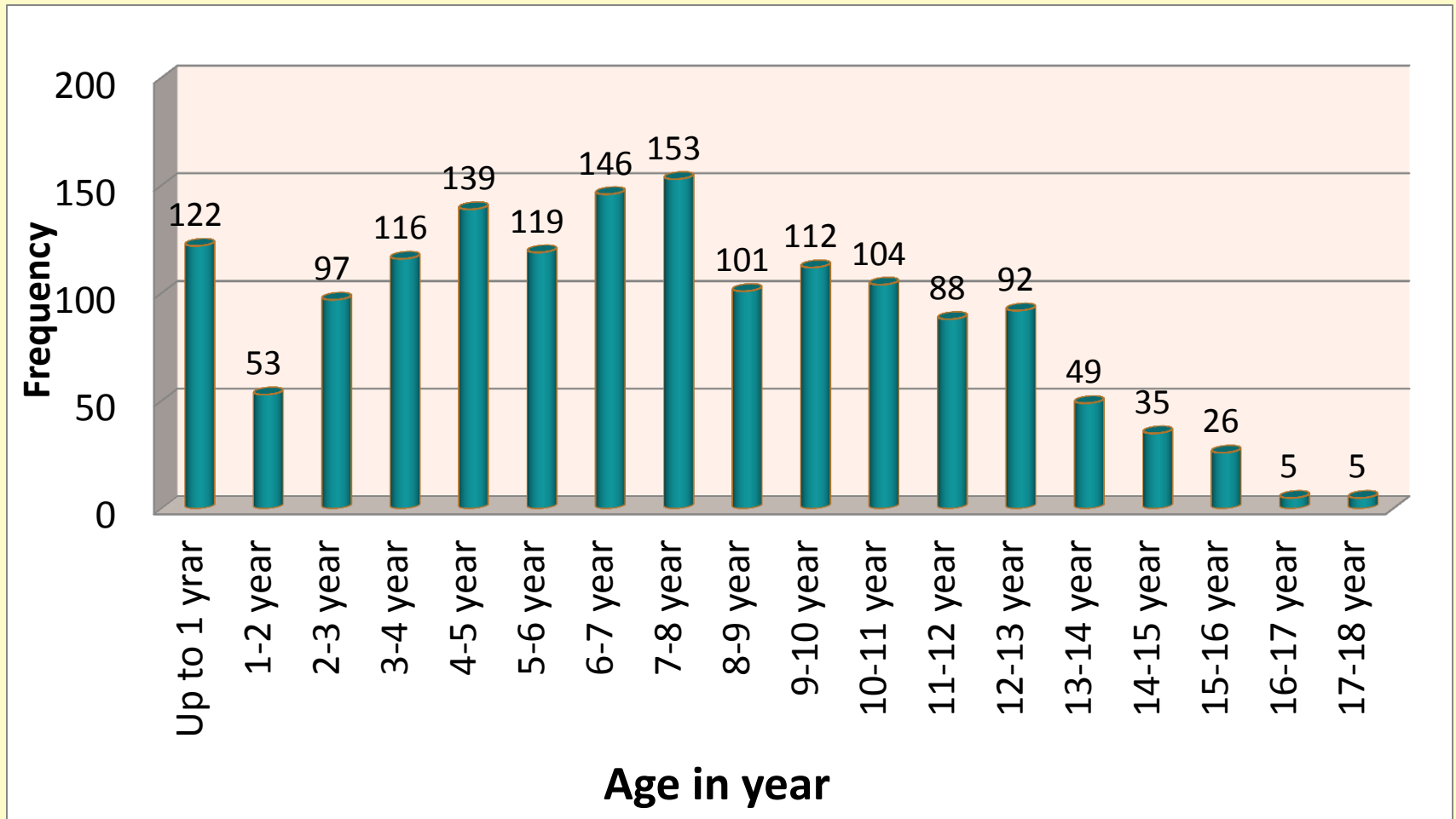
Classification (WHO 1997)- continued

Dengue shock syndrome (Grade 3 and 4) has all of criteria for DHF plus circulatory failure as evidence by
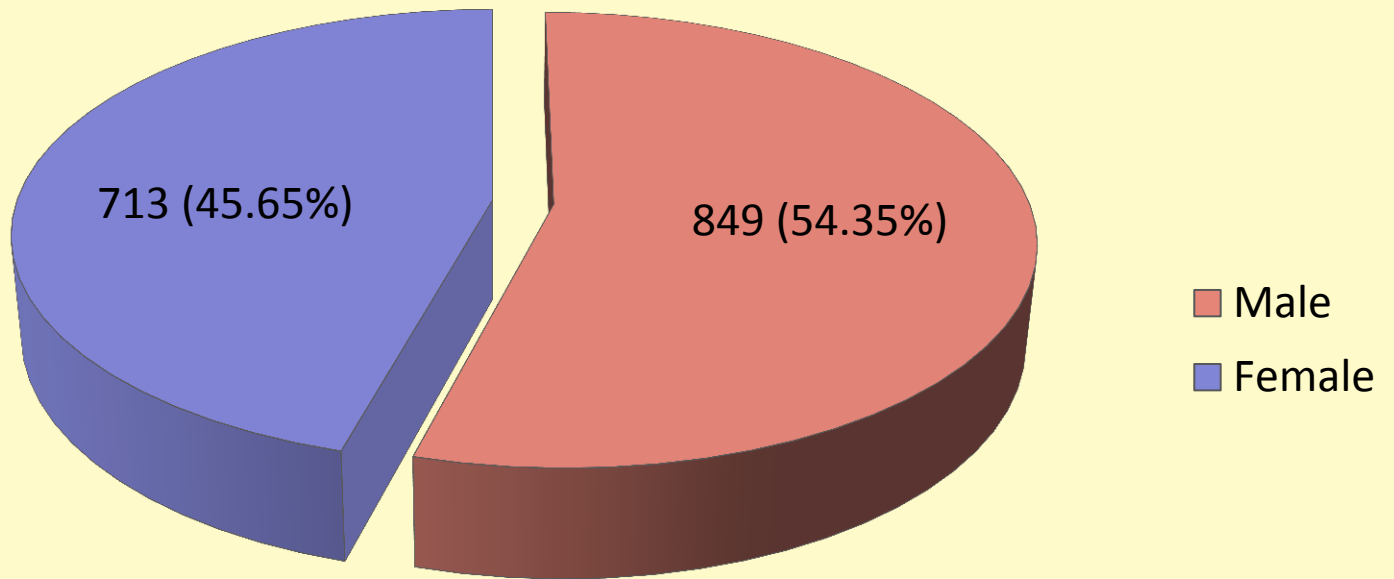
- ✓ Rapid and weak pulse and narrow pulse pressure (<20 mm Hg) or
- ✓ Age specific hypotension and cold, clammy skin and restlessness
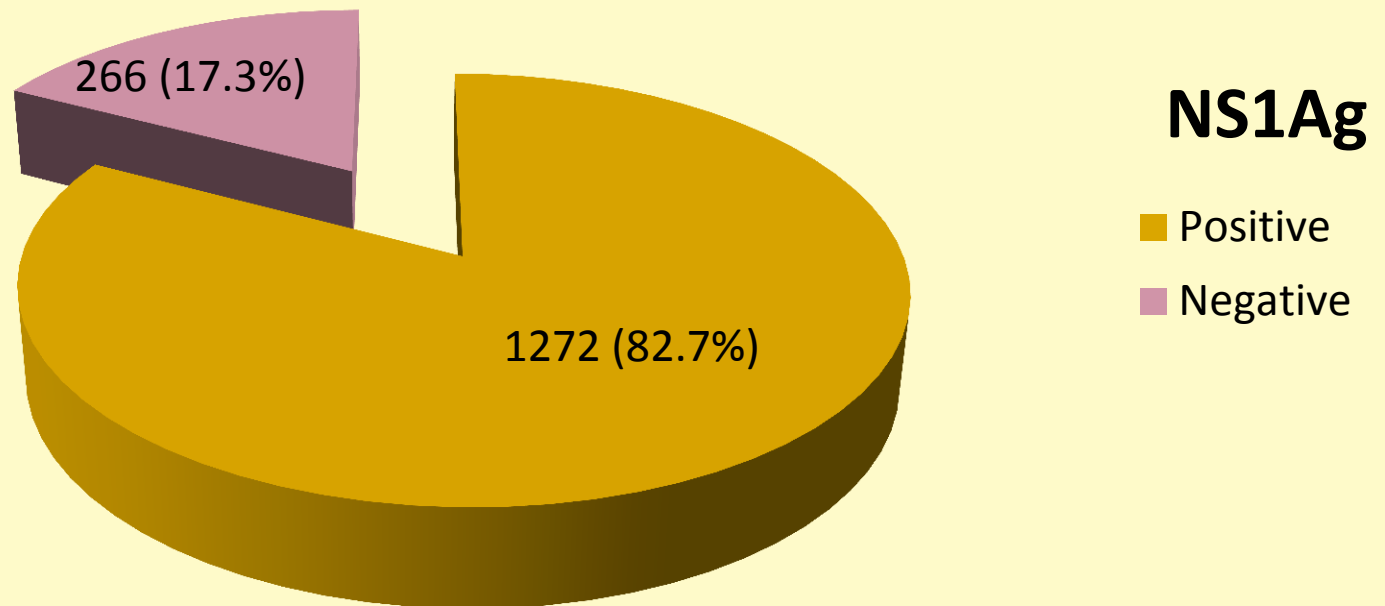
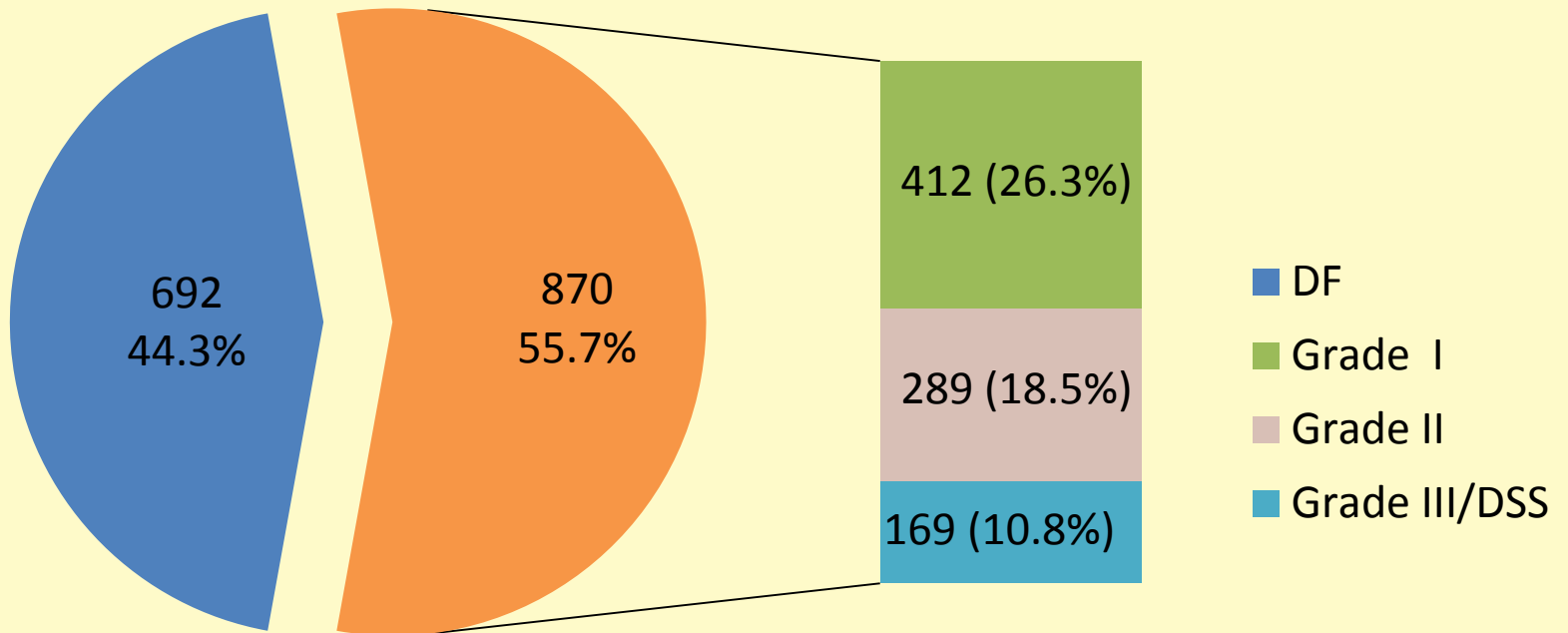# Results

Distribution of age

Sex distribution

713 (45.65%)   849 (54.35%)

- Male
- Female

Laboratory diagnosis

NS1Ag

- Positive
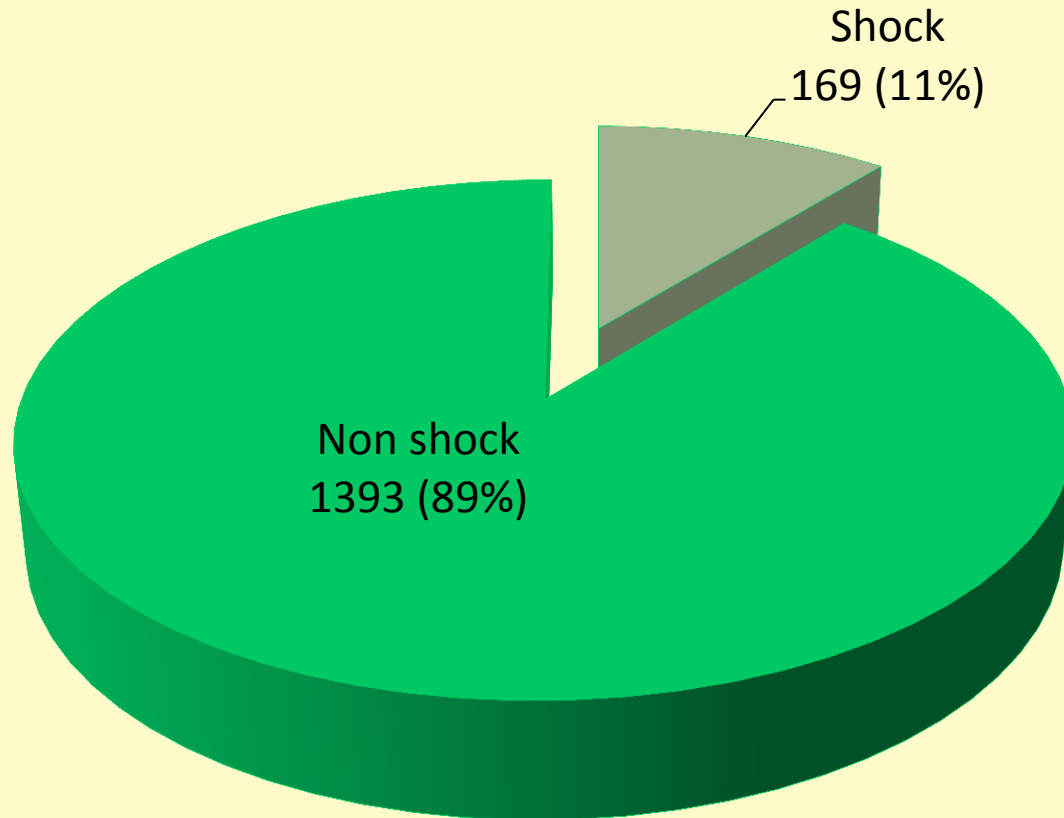- Negative

266 (17.3%)

1272 (82.7%)

82.7% of patients positive for NS1 antigen and the remaining cases were diagnosed as they positive for dengue IgM
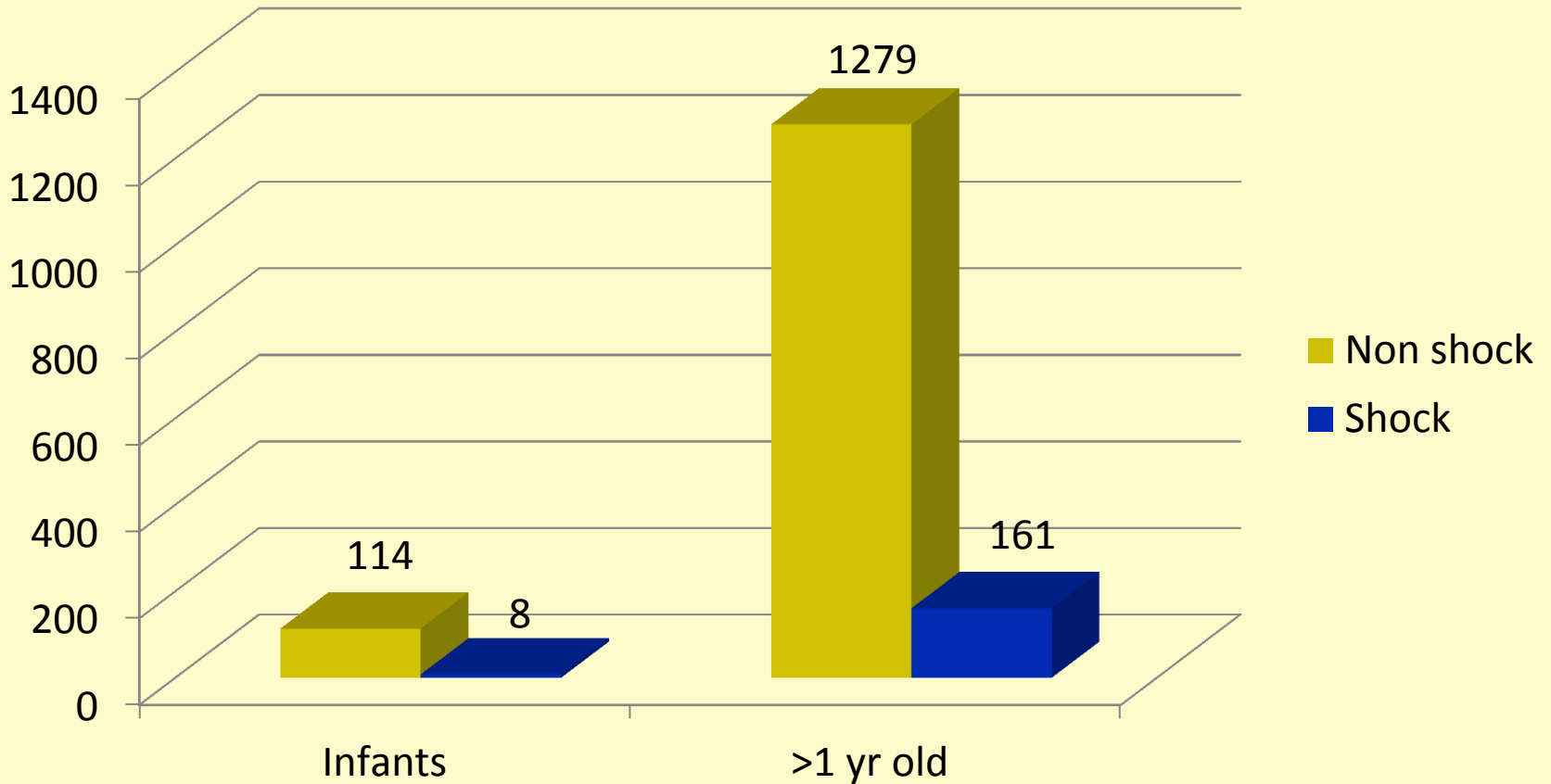
Classification and grading

Distribution of patients according to prevalence of shock

Shock
169 (11%)

Non shock
1393 (89%)

Mean platelets for shock patients = 63.67
Mean platelets for non shock patients= 130.22

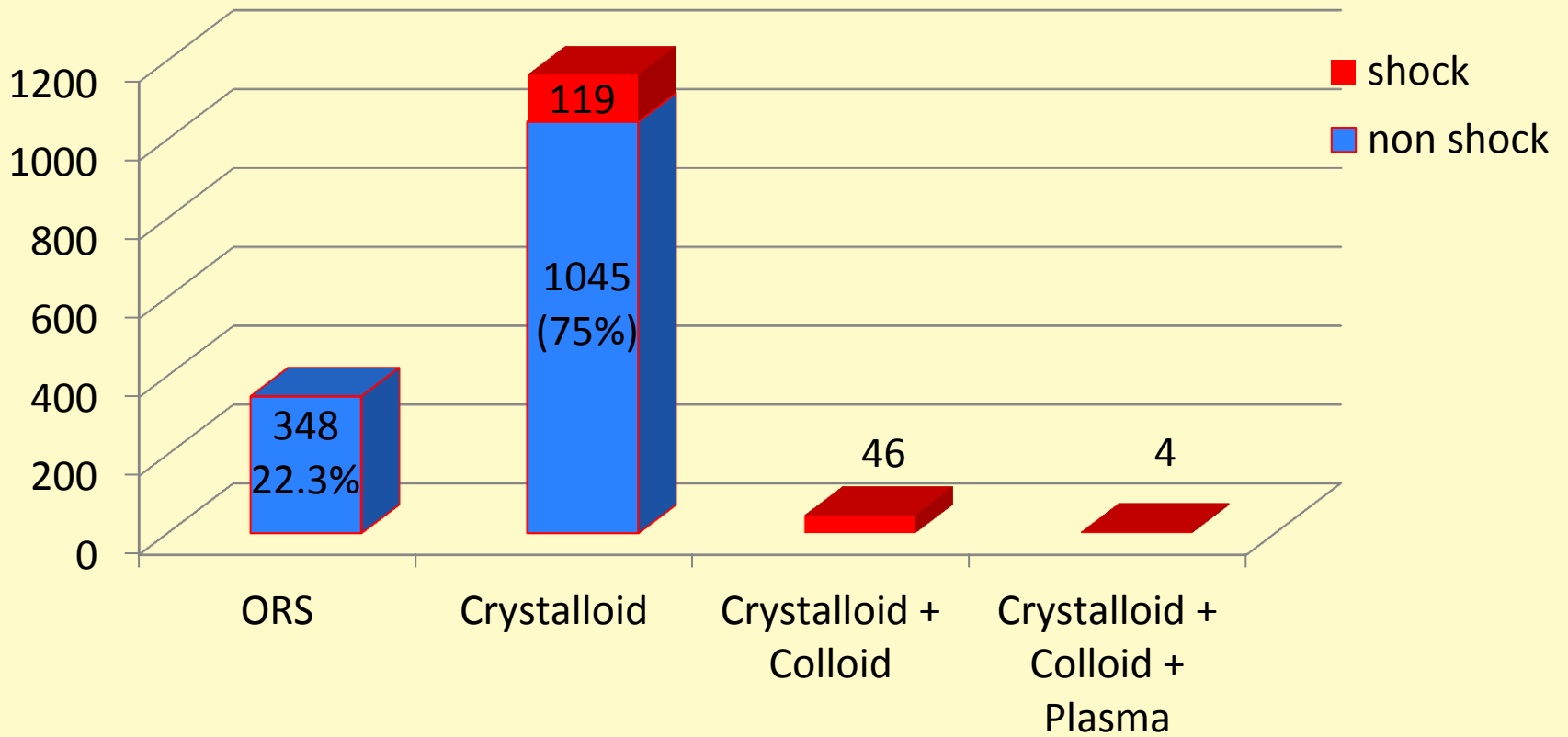# Prevalence of Shock among infants and children who were >1 year old

Of total 122 infants – prevalence of shock was 6.6%
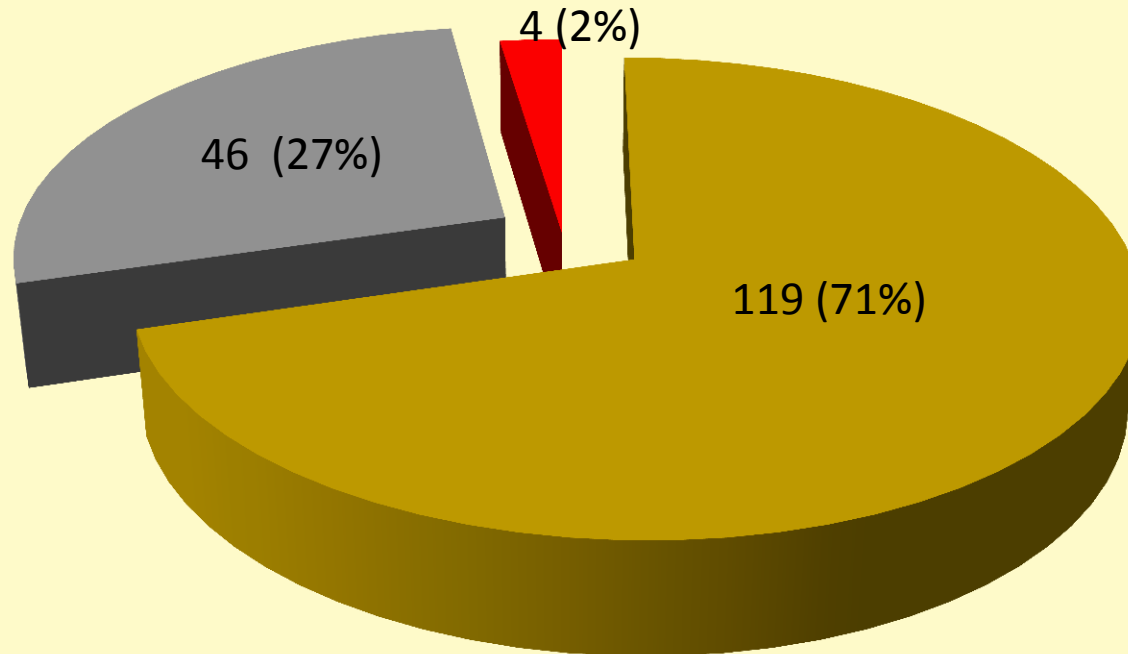Of total 1440 children (>1 year old) – prevalence of shock was 11.2%

Fluid management

75% of non-shock patients were treated with Crystalloid
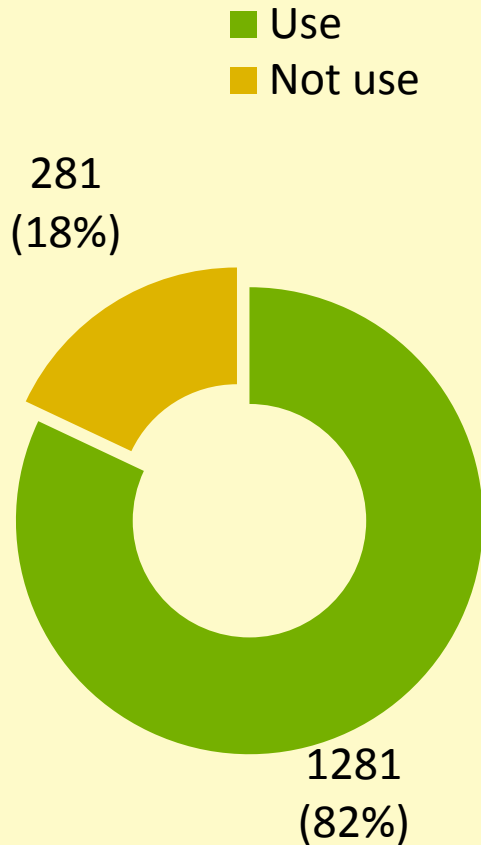
Distribution of shock patients by their fluid management

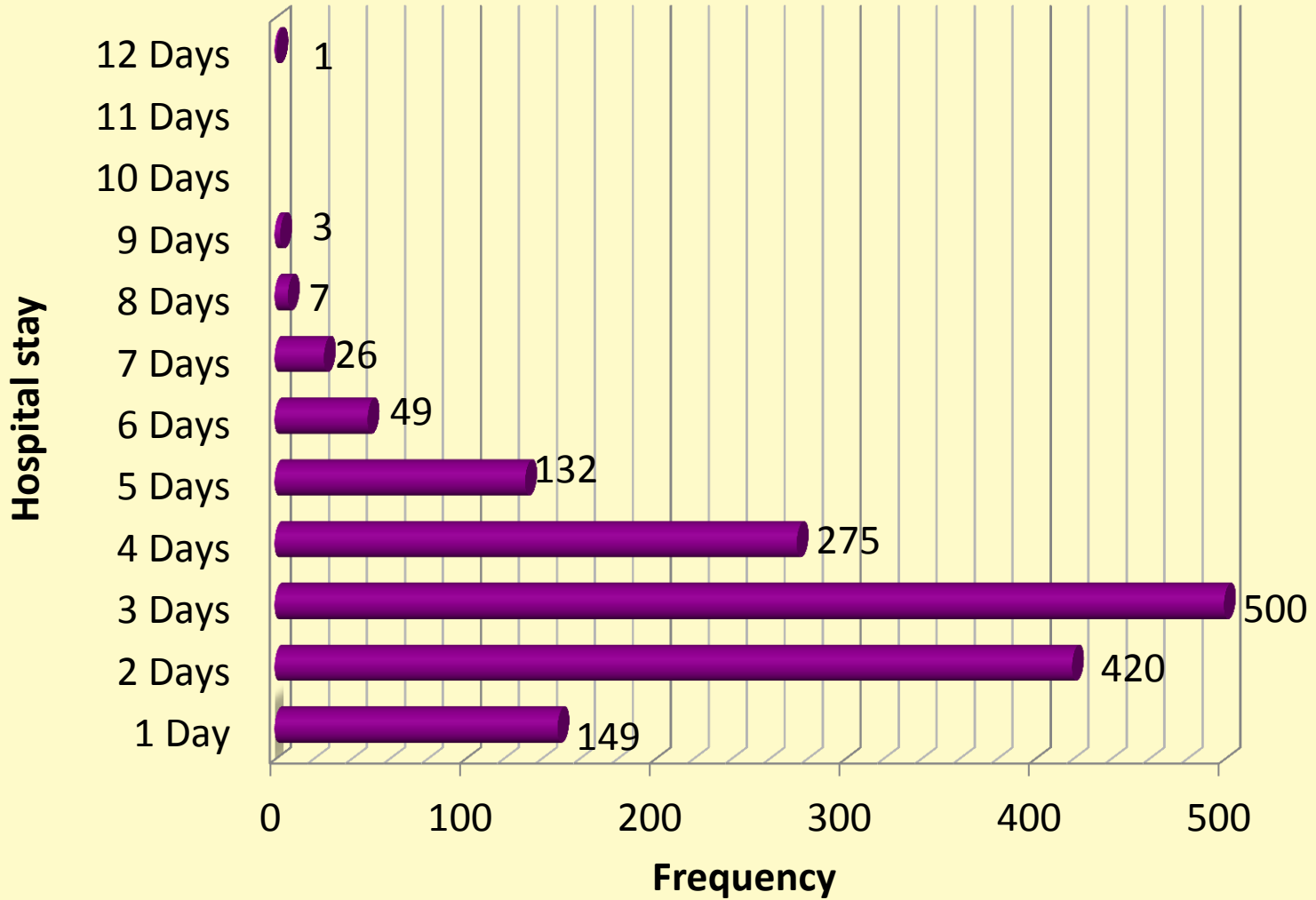■ Crystalloid ■ Crystalloid + Colloid ■ Crystalloid + Colloid + Plasma

4 (2%)

46 (27%)

119 (71%)

Of 169 shock patients, 71% were treated successfully with crystalloid only.

Antibiotic usage

■ Use
■ Not use

281 (18%)

1281 (82%)

Indications	Number (%)
ARI	**120 (42.7%)**
Peritoneal oozing with peritonitis	2 (0.7%)
Appendicitis	4 (1.4%)
Acute GE	7 (2.5%)
Dysentry	7 (2.5%)
Enteric fever	21 (7.5%)
Cervical lymphadenitis	2 (0.7%)
Celllulitis	4 (1.4%)
Skin infection	8 (2.8%)
Pleural effusion with secondary bacteria infection	1 (0.3%)
Consolidation of lung	4 (1.4%)
UTI	7 (2.5%)
Chicken pox with secondary bacteria infection	1 (0.3%)
Sepsis (high total WBC and CRP)	7 (2.5%)
Susceptive bacteria infection	66 (23.5%)
Others	20 (7.1%)

Duration of hospital stay

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

Referral

54 (3.5%) patients were referred to other hospitals

54 (3.5%)

■ Return home

■ Referred to hospitals

1508 (96.5%)
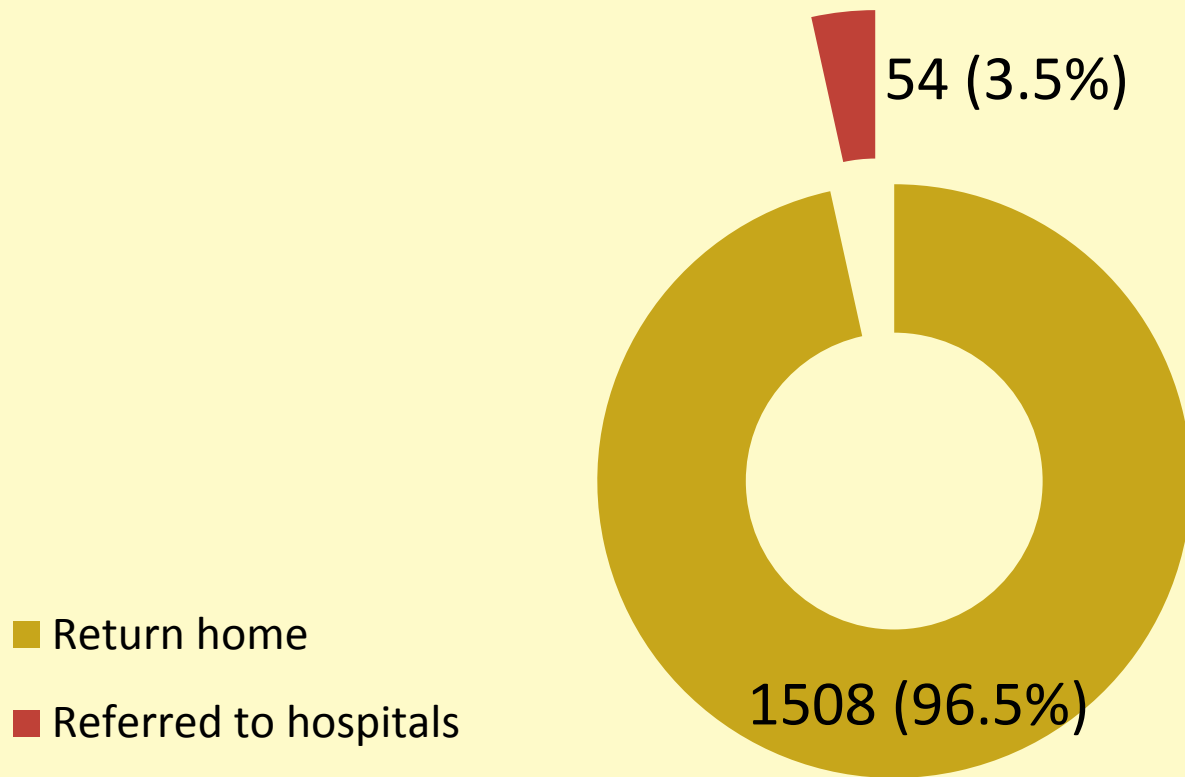
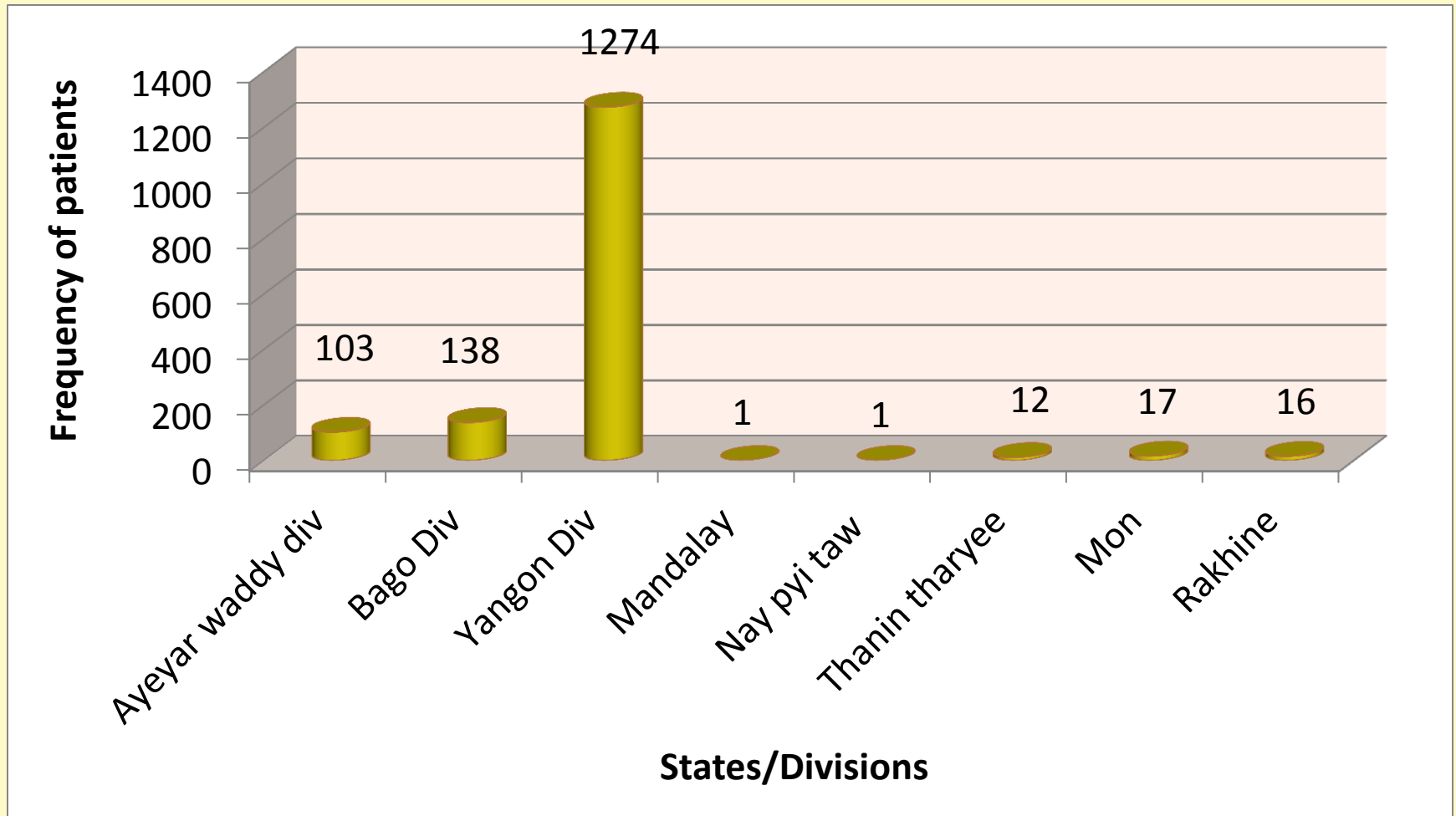# Reasons for referral
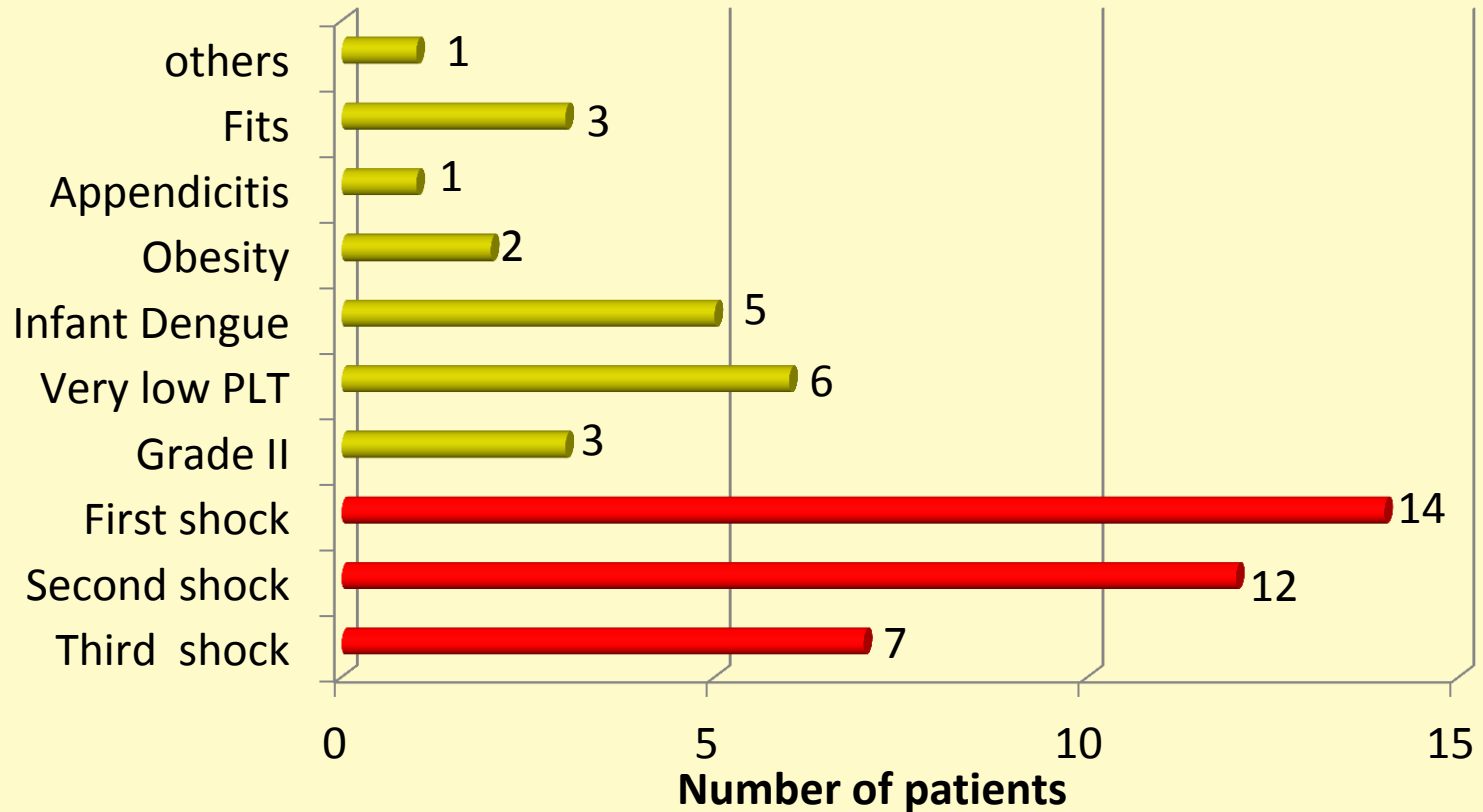
The main reason of referral was Shock
- ❖ (**61.1%** of total 54 referred patients)
- ❖ (**19.5%** of total shock patients)

Distribution of patients by states/divisions

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 infecions.[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.

When tests become positive
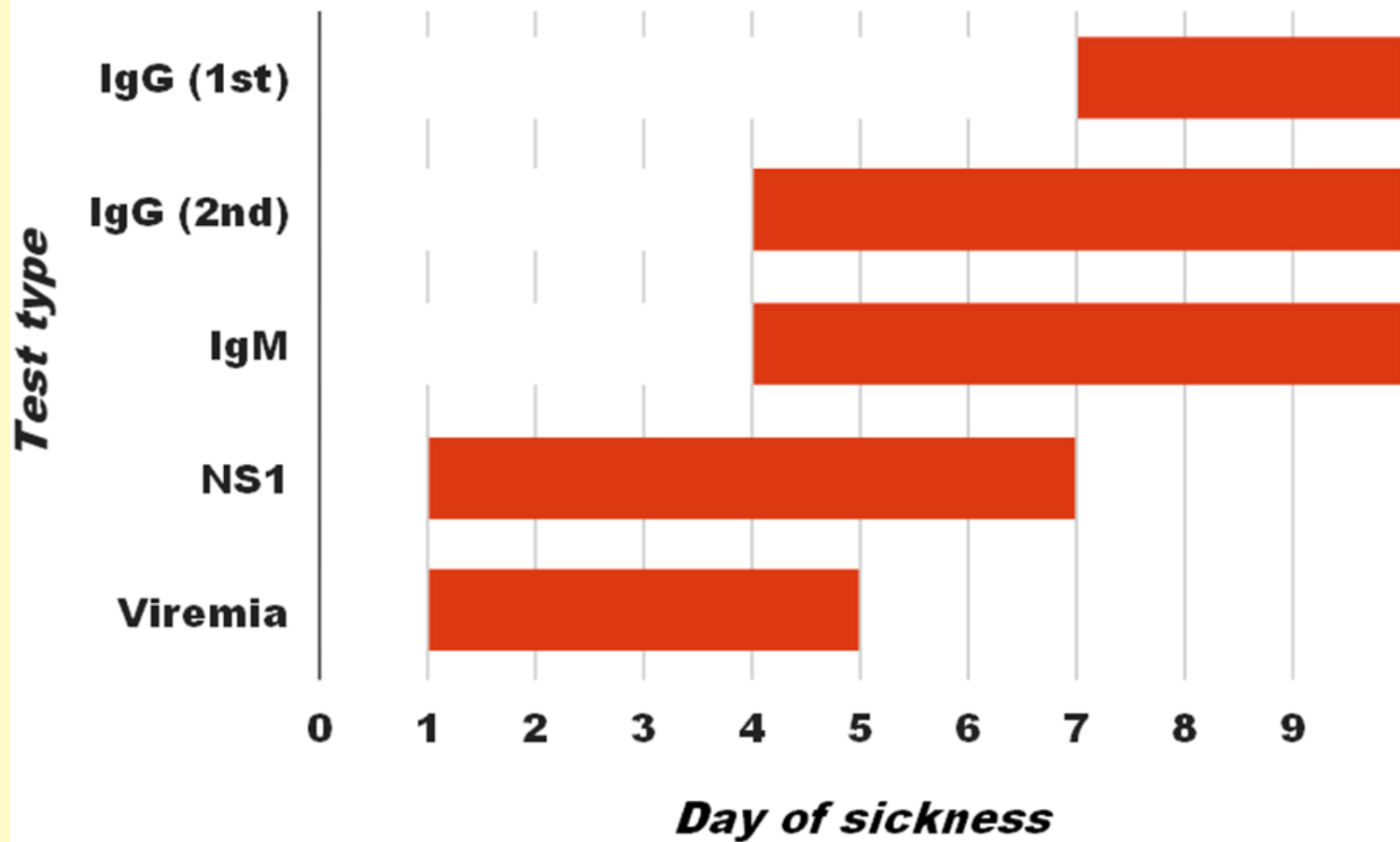
Source : From Wikipedia
Graph of when laboratory tests for dengue fever become positive. Day zero refers to the start of symptoms,
1st refers to in those with a primary infection, and 2nd refers to in those with a secondary infection

- 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[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)

Distribution of Dengue Cases by State/Division in Myanmar, 2007

Number of dengue cases 2007

	0
	1 - 100
	101 - 500
	501 - 1,000
	1,001 - 2,000
	> 2,000

Divisions/States	No. of patients
Yangon	1274
Bago	138
Ayeyarwaddy	103
Mon	17
Rakhine	16
Tanintharyee	12
Mandalay	1
Nay Pyi Taw	1

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

Refences

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2. *Guman MG, Halstead SB, Artsob H, et al. (December 2010). "Dengue: a continuing global threat" Nature Reviews Microbiology. 8 (12 Suppl): S7-S16*

3. *Nguyen Thanh Hung , Fluid management for dengue in children: Paediatr Int Child Health. 2012 May; 32(s1): 39–42*

4. *Dung NM, Day NP, TamDT, Loan HT, Chau HT, Minh LN, et al. Fluid replacement in dengue shock syndrome: a randomized, double-blind comparison of four intravenous – fluid regimens. Clin Infect Dis. 1999;29:787-94*

5. *Distribution of dengue cases in State and division of myanmar 2007: Joint plan of action dengue 2008*

6. *World Health Organization. Geneva, Switzerland: WHO; 1997. Dengue Haemorrhagic Fever: Diagnosis, Treatment, Prevention and Control, 2nd edn.*