



## **Dengue with severe Hepatic involvement**

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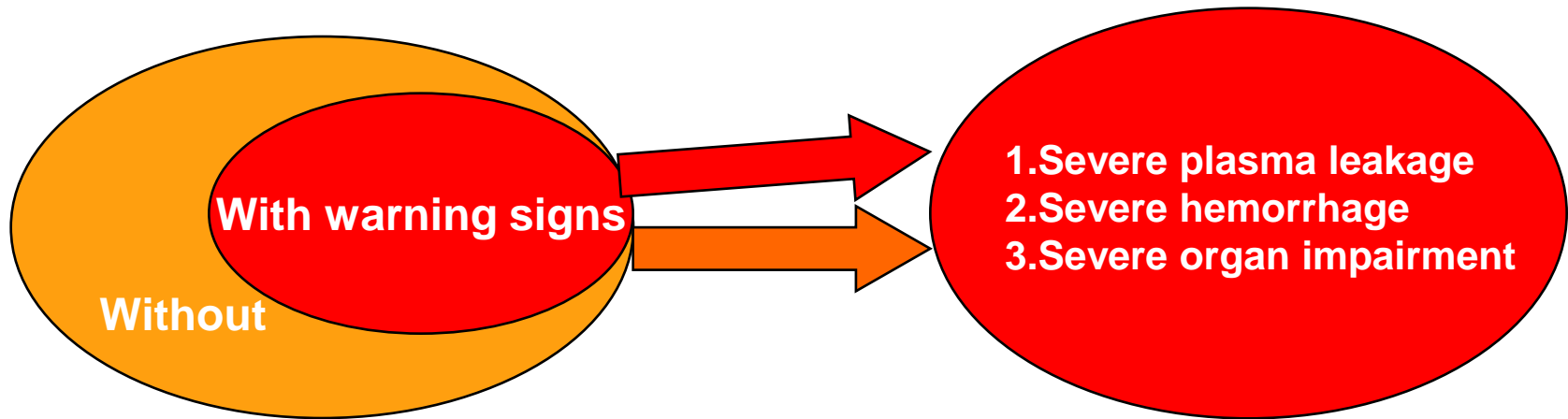
**Mehta Children Hospital**

# What is new?

## New classification WHO 2009

**DENGUE ± WARNING SIGNS**

**SEVERE DENGUE**



## **DENGUE ± WARNING SIGNS**

- **Probable Dengue**
  - live in /travel to dengue endemic area.
  - **Fever and 2 of the following criteria:**
    - ❖ Nausea, vomiting
    - ❖ Rash
    - ❖ Aches and pains
    - ❖ Tourniquet test positive
    - ❖ Leukopenia
    - ❖ Any warning sign
- **Laboratory-confirmed dengue**
  - (important when no sign of plasma leakage)

- **Warning signs\***
    - **Abdominal pain or tenderness**
    - **Persistent vomiting**
    - **Clinical fluid accumulation**
    - **Mucosal bleed**
    - **Lethargy, restlessness**
    - **Liver enlargement >2 cm**
    - **Laboratory: increase in HCT concurrent with rapid decrease in platelet count**
- \*(requiring strict observation and medical intervention).**

## SEVERE DENGUE

- Severe plasma leakage leading to
  - Shock
  - Fluid accumulation with respiratory distress
- Severe bleeding
  - As evaluated by clinician
- Severe organ involvement
  - **Liver : AST or ALT  $\geq$  1000**
  - CNS : Impaired consciousness
  - Heart and other organs

# Dengue in PICU/HDU

## June 2009 – Jan 2010

- Total No - 100
- Very high enzymes ( $> 1000$ ) and hepatitis –7 patients
- Mortality - 3

## DENGUE WITH ORGAN DYSFUNCTION

Age&Sex	Day	AST	ALT	Bili	PT (INR)	PTT	Bleeding	shock	Organ dysfunction	Fluid overload	outcome	Serology
6yr/M	9	1200	600		1.91	54/30	Hematuria	Yes	Renal,Liver,CNS, Muscle	Yes	Recovered	IgM + IgG_ Day9
10/12 M	5	5260	1470		> 1 min	> 1 min	No	Yes	Liver	No	Recovered	Not done
4yr/M	4	2230	570		> 1 min	> 1 min	GI	Yes	Liver,Renal	No	Expired	IgM+ IgG+ Day4
8/12 M	3	9740	4540	5.6	2.26	> 1 min	No	Yes	Hepatic encephalopathy	Yes	Recovered	IgM+ IgG_ Day4
10/12,F	2	19550	4900	1.9	3.23	> 1 min	GI	Yes	CNS,Renal, Liver	No	Expired	IgM+ IgG- Day4
7yr/M	3	2900	1610		2.86	> 1 min	No	Yes	Hepatic encephalopathy ,Renal	Yes	Recovered	IgM+ IgG+ Day4
3 ½ yr/F	3	5100	850		> 1 min	> 1 min	GI, ET	Yes	Liver,CNS,Renal, Lung	No	Expired	Not done

# Pathophysiology

- **DC – SIGN** is a Dengue virus receptor on Monocyte derived Dendritic cells
- **FcR receptor** – Used in secondary infections to enter monocytes.
- **GRP78 receptor** - Dengue virus serotype 2 specific receptor on hepatocytes.
- **37/67-kDa laminin receptor** – Dengue virus serotype 1 specific receptor on hepatocytes.

(*Chutima Thepparit et al.,. Journal of Virology, Nov 2004;78(22):12647-12656*)

# What literature say?

- Dengue infection was the cause in 34.3% Acute hepatic failure cases in a Thai study. (*Ann Hepatol.* 2008 Jan-Mar;7(1):59-62)
- Prevalence of definite Dengue infection (Real time PCR) in AHF was 18.5% in a study done in Lucknow.
- Liver involvement appears to occur more frequently when infections involve DEN-3 and DEN-4 serotypes. (*Digestive Diseases and Sciences.* June 2005; 50(6) : 1146–1147).
- ALT levels were highest in DENV 2 infection followed by DENV 1 & 3 in a study done in mice in Mexico.



- The rate of liver dysfunction among the patients without shock (36/120) is not significantly different from those with shock (30/71). 8% with Hepatic dysfunction due to Dengue developed Hepatic Encephalopathy and there were no deaths in an analysis of Thai cases (*J ayub med coll abbotabad 2007;19(1)*)
- > 10 times elevation with hepatitis in 3.8 % of total Dengue cases (1,585 serologically confirmed dengue cases ) (*Braz J Infect Dis. 2004 Apr;8(2):156-63*).
- Hepatic dysfunction was more severe in children with prolonged shock.. (*Kamath Shrishu ,Ranjith Suchitra Indian journal of pediatrics 2006, vol. 73, n°10, pp. 889-895*)
- Liver enzymes were markedly elevated in more than 60% of the children who were dengue seropositive. no significant difference between the subgroups of dengue with respect to LFT (*Manjith N , SMC Indian Pediatrics 2002; 39:1027-1033*)

1. Is it common in any particular age?
2. Shocked patients?
3. Co infections?
4. Prognostic value?
5. Encephalopathy. Dengue or hepatic?
6. Primary? Secondary?
7. Is it becoming more common in this epidemic?

# Evaluation for co infections

- 5 out of 7 patients were evaluated for malaria – Negative
- 4 out of 7 patients were evaluated for leptospirosis – Negative
- 2 out of 7 patients were evaluated for HBsAg, Anti HAV IgM, Anti HEV IgM - Negative

# Conclusion

- All 7 patients presented with shock
- Prognosis
  - 3 out of 7 patients died. All deaths in our PICU had Acute liver failure due to Dengue infection.
- 5 out of 7 patients were serologically confirmed and 2 of them were secondary infection.

**THANK YOU**