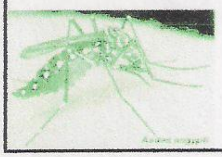
DENGUE VIRUS

Dr Priyo Budi Purwono
Departemen Mikrobiologi
F.K. UNAIR



ARBOVIRUS

- Kelompok virus yang ditularkan melalui gigitan hewan arthropoda → Vektor
- Bukan nama famili
- Vektor: nyamuk, kutu(tick), lalat (Phlebotomus)
- 1940 : ± 15 spesies
- Sekarang : lebih dari 400 spesies

MANIFESTASI KLINIS ARBO VIRUS :

1. Demam (Undifferentiated) s/d (+++)
2. Ensefalitis / Meningoensefalitis
3. Perdarahan (Haemorrhagic fever)
4. Poliarthritis

Gejala pada umumnya merupakan gabungan panas dengan salah satu gejala diatas

DEMAM BERDARAH :

Terutama oleh karena virus :

1. Dengue (1-4) → Asia Tenggara
2. Yellow fever → Afrika, Amerika
3. Rift-Valley fever → Afrika Utara (Bunya)

Demam berdarah merupakan manifestasi klinis yang berat

Perdarahan : Petechia → Epistaxis → Hematemesis → Melena → Shock

Petechia= bintik kemerahan

Mosquito borne flavivirus:

virus	vektor	Geografi
-Dengue	Aedes	Worldwide(tropik)
-Yellow fever	Aedes	Afrika,Amerika Sel.
-Japanese encephalitis	Culex	Asia
-West Nile	Culex	Afrika,Eropa,Asia tengah
-St.L. enceph.	Culex	Amerika Utara
-Murray Valley	Culex	Australia

Mosquito-borne Alpha virus:

Virus	Vektor	Geographic
Chikungunya	Aedes	Afrika ; Asia (poliartritis)
O,Nyong-nyong	Anopheles	Afrika
Ross River	Culex/Aed	Austr, South Pasipic Wild mammals
Venezuelan E.E dst.	Aedes,Culex,Mansonia	Amerika tengah & Selatan (Equines,human)

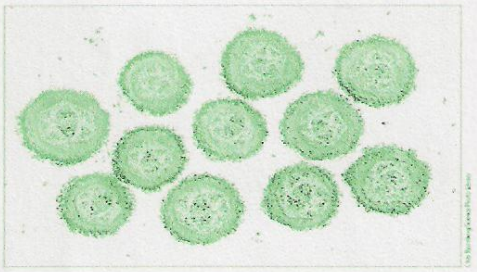
Virus DENGUE

- Termasuk Arbovirus
- Genome SS RNA
- Vektor : Aedes aegypti / albopictus
- Serologis : 4 subtipe (DEN I – IV)
- Merupakan problem di negara Tropis :
  - Asia Tenggara
  - India
  - Pasifik
  - Caribbean

History (WHO)

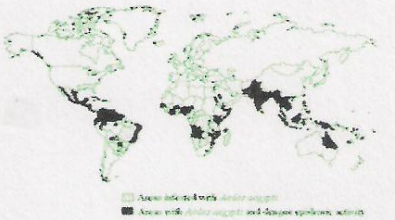
- First described in 1780 as "breakbone fever" by Benjamin Rush in Philadelphia.
- Called "Dengue" after an epidemic in Cuba in 1828.
- Found Aedes aegypti mosquito to be vector in 1905.
- DHF widely known in 1954 outbreak in Philippines where it was known as Philippine hemorrhagic fever.
- This became endemic and epidemic in many areas of tropical Asia.
- In 1981 DHF first appeared in epidemic form in the Caribbean.

Dengue Virus (Rigau-Perez, 2006)



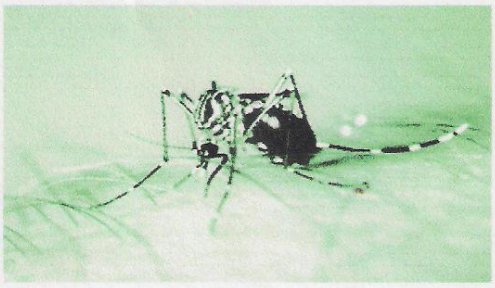
Serotype of Dengue Virus (Gubler,1997)

World Distribution of Dengue - 2000

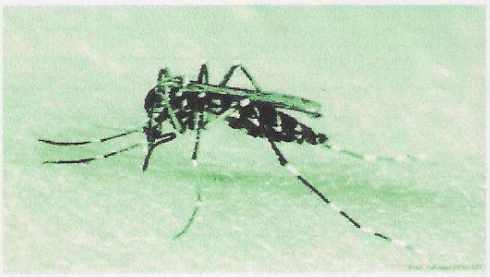


CDC

Aedes aegypti Mosquito (CDC)



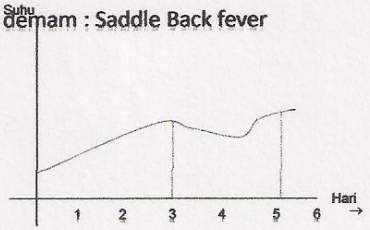
Aedes albopictus



Klinis :

- Demam tinggi → demam Dengue klasik (Infeksi I)
  (1 - 3 hari demam , sembuh)
- Perdarahan → demam berdarah dengue
- Shock (Dengue Shock Syndrome/ DSS)
  - biasanya terjadi panas hari ke 4-6
  - terjadi plasma leakage (kebocoran plasma darah)

Tipe demam : Saddle Back fever



- Penyakit ini menyerang segala umur
- Manifestasi klinis lebih berat pada penderita dengan reinfeksi (infeksi sekunder) → shock
- *Waspadai : hari ke 4 – 5 (saat suhu tubuh ↓)*
  Bisa merupakan tanda awal kegagalan sirkulasi (shock)

PERDARAHAN (DBD) :

- Bercak merah pada kulit (digigit nyamuk)
- Uji tourniquet (hari 1 – 2)
- Diikuti perdarahan pada organ lain → epistaxis, hematemesis, melena

↓

D.S.S.

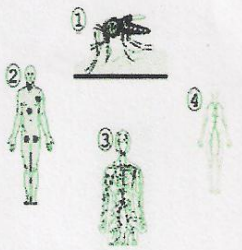
Positive Tourniquet Test

PENULARAN :

- Virus berada dalam darah penderita 1-2 hari sebelum demam
- Masa viremia (4-7 hari) → sumber penularan → bila digigit nyamuk → virus berkembang biak di nyamuk → siap untuk ditularkan pada orang sehat (periode ekstrinsik = 8-10 hari)

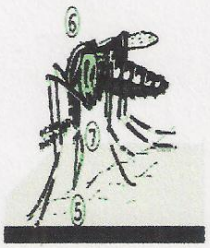
Replication and Transmission of Dengue Virus (Part 1)

- 1. Virus transmitted to human in mosquito saliva
  2. Virus replicates in target organs
  3. Virus infects white blood cells and lymphatic tissues
  4. Virus released and circulates in blood



Replication and Transmission of Dengue Virus (Part 2)

- 5. Second mosquito ingests virus with blood
  6. Virus replicates in mosquito midgut and other organs, infects salivary glands
  7. Virus replicates in salivary glands



Target sel Virus Dengue

- Sel monosit
- Sel makrofag
- Sel endotel
- Sel Ly B
- Sel Kupffer

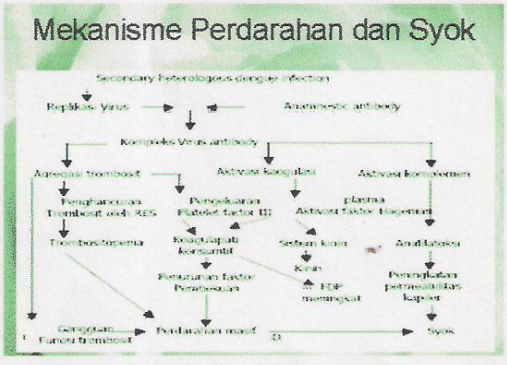
DENGUE SHOCK SYNDROME (DSS)

- Penyulit serius → shock
- Shock terjadi oleh karena bocornya dinding kapiler → plasma keluar ke jaringan interstisial
- Dinding kapiler rapuh (permiabilitas ↑↑) oleh karena :

  ↓

  Terjadi pada reinfeksi (sekunder) oleh subtipe virus dengue lain(heterolog)
- Waspadai → penderita dewasa
- Bisa terjadi pada anak < 1 thn (Ab. dari ibu)

Mekanisme Perdarahan dan Syok



DIAGNOSA

- 1. KLINIS : Demam tinggi, tanda tanda perdarahan
- 2.PENUNJANG/LAB.:
  hematologis : Hemoglobin, Hematokrit, Platelate
  serologis : IgM, IgG anti Dengue, antigen NS1
  Virologis : Kultur virus, PCR

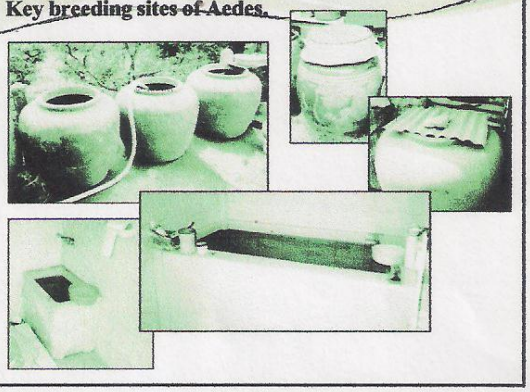
Terapi

- Pemberian cairan (per oral, infus)
- Terapi gejala, suportif :
  - parasetamol
  - multivitamin
  - antibiotika, bila ada infeksi bakterial sekunder
- Observasi kondisi pasien secara rutin

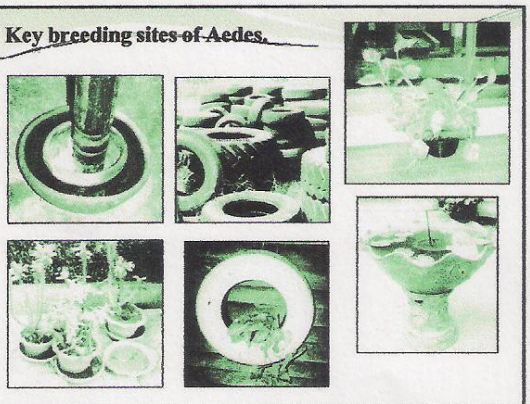
Dengue Prevention and Control

- **Surveillance (Pendataan Kasus)**
- **Integrated vector control management (Abate, fogging, 3M, Puskesmas)**
- **Case management (Pelayanan Pasien)**
- **Social mobilization (transmigrasi)**
- **Update knowledge and research (penyuluhan, seminar ilmiah, vaksin)**
- **Outbreak control**

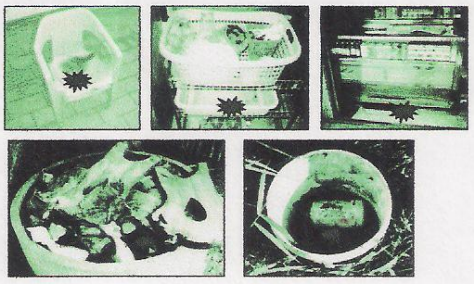
Key breeding sites of Aedes.



Key breeding sites of Aedes.



Key breeding sites of Aedes.



BERANTAS
Demam
Berdarah Dengue
(DBD)
dengan
3M
Menguras
Mengubur
Menutup
AWAS
NYAMUK !!