

# Rabies

## Clinical Tropical Medicine

### FACTM (Clinical) Pt 1

Tim Inglis

Division of Microbiology & Infectious Diseases,  
PathWest Laboratory Medicine, WA



# Study materials

**Oxford Handbook of Tropical Medicine.**  
3<sup>rd</sup> Edition, Eddlestone M *et al.* 2008. OUP.

**Manson's Tropical Diseases**  
22<sup>nd</sup> Edition, Cook & Zumla. 2008. Elsevier

- recommended bookshelf
- FACTM study notes
- self-assessment questions

Blog <http://micrognome.priobe.net>

Web [www.priobe.net](http://www.priobe.net)

FACTM <http://lifeinthefastlane.com/exams/actm-fellowship/>



# Scale of the problem

- Worldwide with a few notable exceptions
  - mainly islands
- > 50,000 cases p.a. in Africa & Asia; 30% one year increase in China
- Australia: ABLV deaths in 1996
- Bite or saliva from rabid animal; dogs, canids, bats; organ Tx, vertical
- Repeat bites to head – 60-80%, single bite 30% mortality
- Poor, children, cyclists/motorcyclists
- Underreported



# Clinical features

- **Onset 20-90d after exposure**
- **Furious rabies:**
  - hydrophobic spasms
  - excitable, aggressive, hallucinating
  - coma & paralysis
  - respiratory or cardiac arrest after spasm
- **Paralytic rabies:** less common, bat-associated
  - Paraesthesiae, hypotonic weakness, progressing centrally
  - Fasciculation, hairs-on-end
  - Hydrophobia is late feature
- **Outcome, almost always fatal**



# Natural history



- **Virus:** single strand, negative sense RNA virus, 7 genotypes of lyssavirus within phylogroup 1 of Rhabdovirus group
- **Centripetal spread via nerves:** endocytosis, movement at 3mm/hr by retrograde axonal spread
- **Intracerebral replication:** very high titre in brain, aggregates of viral protein = Negri bodies, infection of limbic system causes aggressive behaviour
- **Centrifugal spread:** additional replication in salivary glands, release into body fluids, survival for hours at 37°C
- **NB:** viraemia absent, viral antigens hidden from immune response



# Differential

- tetanus: < 15d, constant rigidity
- CNS toxins & poisons
- Rabies phobia
- Guillain-Barré syndrome
- Post-vaccinia encephalitis
- Other viral encephalitis



# Investigation

Type	Test	Timing	Sample
Virus isolation	Suckling mice, or mouse neuroblastoma	Week 1 of infection	Saliva, throat swab, respiratory secretions, brain biopsy, CSF
Rapid identification	PCR IFA		Saliva, CSF, skin Bx Frozen section, skin Bx, neck
Antibody tests	neutralisation	Week 2	serum

PM: needle necropsy



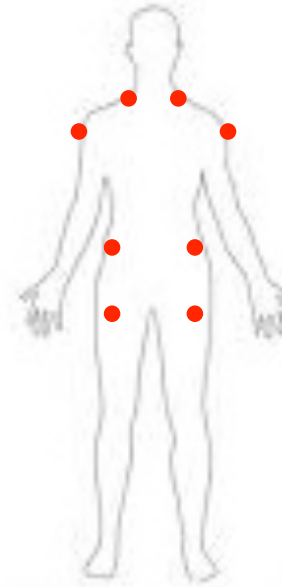
# Clinical management

- **After confirmation of diagnosis:**
  - Analgesia & sedation
  - Role for ICU
  - Few recoveries, most controversial



# Management II: prophylaxis

- **Post-exposure prophylaxis**
  - Context dependent
  - 1<sup>st</sup> aid to injured part
  - WHO guidelines
    - High risk exposure: vaccine & RIG
    - Low risk: vaccine
- **Vaccines**
  - [Semple vaccine]
  - Human Diploid Cell Vaccine (HDCV)
  - Purified Chick Embryo Vaccine (PCEV)
  - Purified Vero Cell Rabies Vaccine (PVCR)
- **Regimens**
  - Standard 5 dose i.m.
  - Economical 8 site i.d. day 0, 7, 28, 91
  - Economical 2 site i.d. plus RIG



# Prevention I: pre-exposure

1. No deaths have followed pre-exp vaccination, exposure & booster
2. Given day 0, 3 & 28
3. Reduced take with intradermal & chloroquine
4. Booster after 1-2yr to extend efficacy



# Prevention II: public health

1. Shooting dogs doesn't work
2. Vaccinating dogs does
3. Removal of garbage
4. Vaccinate wild animals?
5. Taiwan, Japan, parts of South America

## Emerging issues

- Returning travellers from Indonesia
- ABLV

