



RIFT VALLEY FEVER towards a DIAGNOSIS

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ONDERSTEPSPOORT
SOUTH AFRICA

THE POPULAR PRESS - A QUOTE

"Prior to 1977, RVF was considered to be a largely veterinary disease of bovine and ovine stock"

RVFV 1^o recognised in Kenya in 1930

Aswan High Dam

- * changed the ecology of the Nile

- * slowed the river and prevented annual floods

1977 - 6yrs after completion of the dam

- "people epidemic" -

How?

- Exposure to virus (abraded skin or m.m.)
- Mosquito bites



two secondary cycles



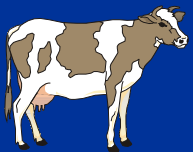
sylvatic



urban peridomestic

occupational exposure

- livestock industry
- abattoir workers (pH <6)
- ritual slaughter aerosols
- consumption raw milk



RIFT VALLEY FEVER (RVF)

1. DIAGNOSTICS:-

Why do we want a diagnosis?

- and fast?



ZOONOSIS

Definition: a disease that is naturally
transmitted between
humans - animals



DIAGNOSIS

A. antibody

B. antigen

A single death/abortion is confusing

Sudden onset of abortions (all stages)

Neonatal deaths - jaundice/haemorrhages

- > rainfall
- > mosquitoes
- > sustained flooding

SUSPICION OF RVF

Human is often the sentinel
Human amplifying host



A - ANTIBODIES:-

Useful -
Safe -

- Surveillance
- Early Warning
- Diagnosis (Early response d3)

IgM

IgG

Other

LAB : FIELD

LAB TESTS

(vaccinated staff)

1. OTHER
 - HI hamster liver (sucrose/acetone extracted)
T.C. antigen
 - VNT
 - AGID

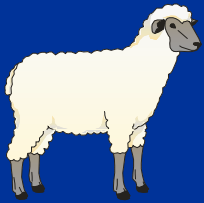
2. IgG ELISA
 - 1984/1995 i-Elisa (whole virus)
Se/Sp 97%
 - i-Elisa (rec. antigen)
 - Inhibition Elisa
Se/Sp 99% (pos and neg antigen)
> Advantages (background, spp.)
 - Sandwich Elisa similar Se/Sp

IgG ELISA

(cont.)

i - Elisa - safe, stable and quick

- sacrifice some Se
- pre coated and pre blocked
- performs well under African conditions



3. IgM ELISA - also pre coated and pre blocked

- Capture Elisa
- Anti-species antibody to detect IgM
(rabbit anti-sheep x ovine, bovine & caprine)
- Post infection or vaccination
d 3/4 >d.28

FIELD TESTS

This is a rural disease !

A rapid "pen-side" test would be useful.

Rapid Immunochromatographic Test

- rec. antigen
- all species (+ humans)
- blood or serum
- IgG and IgM
- Se and Sp of 100% and 97%

→ a lateral flow strip test

RAPID

(cont.)

- Essentials
- conjugate pad with 40nm gold
 - separation pad
 - test line
 - control line

Duplicate conjugate : gold complexed antigen
gold complexed IgY

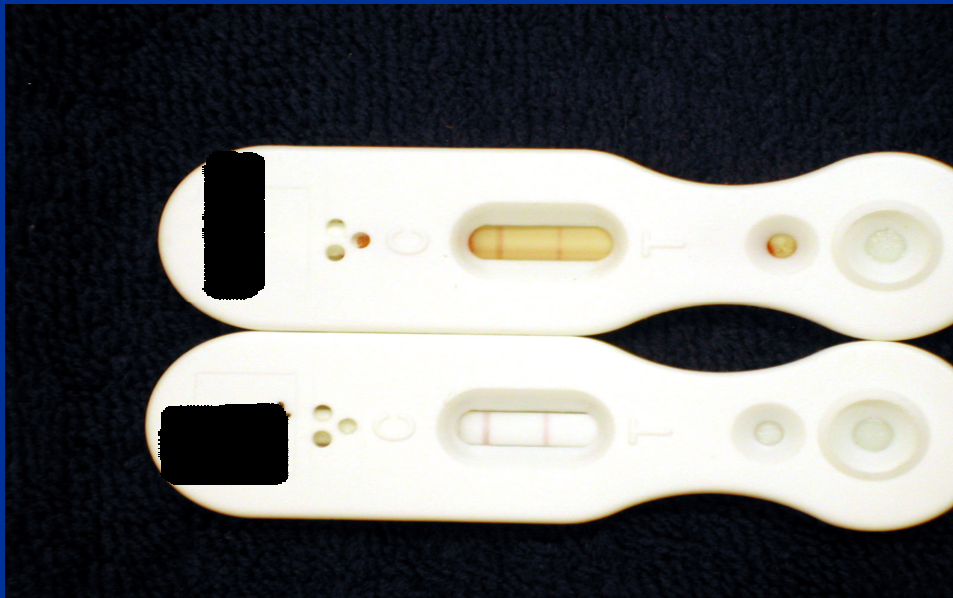
Buffers



Read after 10 mins. Max 30 mins.

Properties

- Store & use at 4 – 30 °C
- Shelf life – 18 months
- Whole blood & serum



B - ANTIGEN:-

Confirmatory -

Limit exposure -

- Enveloped virus
 - Relatively fragile
 - pH sensitive
 - Grows well (mouse brain, tissue culture)

Isolation

Histopath

PCR

1. Isolation
 - on ice or glycerol/saline
 - liver, spleen, foetal brain (autolysis)
 - lytic in TC
 - ID with FA or PCR
2. Histopath
 - in formalin, useful for IMP staining
 - pathognomic liver lesions
3. PCR
 - test of choice
 - speed and safety
 - real-time RT-PCR (published)
 - targets glycoprotein gene G2

FOOTNOTE

Then: suspect tissue x known positive serum

AGID

Now : battery well validated tests

choice of antibody/antigen

RVF Diagnosis

SPEED and SAFETY

Thank You

