

B – VIRUS

ANIMAL GROUP AFFECTED	TRANSMISSION	CLINICAL SIGNS	FATAL DISEASE ?	TREATMENT	PREVENTION & CONTROL
Asian macaques foreign hosts: man, African-, American nonhuman primates	Salivary excretion; Transmission by biting, scratching, sexual contact	In Asian macaques usually none; in man and African nonhuman primates fatal encephalitis	Yes – in man, African-, American- and young nonhuman primates	Nucleoside analogues; Trisodium phosphonoformate	<i>in houses</i> Protective measures, first aid of lesions <i>in zoos</i> protective measures, first aid of lesions

Fact sheet compiled by Manfred Brack, formerly German Primate Center, Göttingen/Germany.	Last update 22.11.2008
Susceptible animal groups Original hosts : Asian macaques, in captivity transmissible to man, African and New- World nonhuman primates.	
Causative organism <i>Herpesvirus simiae</i> (B virus, Cercopithecine herpesvirus type 1) . <i>H.simiae</i> is an alpha-herpesvirus cross reacting with <i>H.hominis</i> and SA 8. In different macaque host species exist different viral genotypes with different virulence.	
Zoonotic potential Fatal in man after accidental transmission in holding facilities, laboratories etc.	
Distribution As natural infection Asia, in captive macaque colonies World-wide.	
Transmission Between macaques primarily via biting lesions, another, less important route is sexual contact particularly during adolescence. Transmission to man via biting, scratching or by contamination of mucous membranes (conjunctiva!) or pre-existing wounds during handling of virus-shedding animals; aerogenous infection possible, but less common.	
Incubation period In man: 5 to 8 days.	
Clinical symptoms 1. In Asian macaques usually silent infections, occasionally dyspnea, nasal discharge, conjunctivitis, oral / perioral vesicles or self healing ulcers. In newborn macaques and other nonhuman primate species usually pneumonia, death, but occasionally asymptomatic infections. In man local painful / itching erythema and vesiculation of the biting sites, regional lymphadenopathy, headache, myalgia, vomiting, photophobia, hyper – and paresthesia, neck - stiffness, confusion, ascending paralysis, death.	

**Post mortem findings**

In nonhuman primates rarely oral / perioral herpetic vesicles or ulcers (syncytial giant cells, Cowdry type A intranuclear inclusion bodies) , in fatal cases haemorrhagic bronchopneumonia, hepatic-, splenic- or adrenal necroses.

In man transversal necrotizing ganglioneuritis / myeloencephalitis particularly in oblongate medulla and adjacent nervous tissues.

Diagnosis

Virology: tissue culture, electron microscopy, restriction endonuclease DNA-analysis, nucleotide sequencing; PCR, fluorescein-labeled protein coding sequence detection.

Serology: neutralization, immunofluorescence, ELISA with or without Western blot, competitive RIA's , Diadot test , SA 8 can be used as antigen.

Material required for laboratory analysis

For virological diagnostics: vesicle material or material from other lesions . NIH requirements: place 3 x 5mm tissue sample , or 3 – 4 ml cerebro-spinal fluid in tubes (**no glass!**) containing 1 – 2 ml viral transport media(sterile modified essential media (MEM) with Earle's salt and 50 µg/ml gentamycin , or Hank's modified MEM, tryptose phosphate broth, normal or phosphate buffered saline or any sterile, osmotic, buffered solution of pH 7,0) , store and ship on –60°C or dry ice. For cryopreservation 1% calf serum or 1% fetal calf serum is recommended.

For serology: serum : NIH requirements: centrifuge 5 – 7 ml clotted (15 min) blood to obtain 0.5 – 2.0 ml serum, place serum in storage tube (**do not use glass tubes !!**), **storage and shipment at <-20°C.**

Correct labeling (Animal /patient identification, collection date) is mandatory!

Relevant diagnostic laboratories

German Primate Center,
Kellnerweg 4
D 37077 Göttingen / Germany
Phone: 49 (0)551 – 38510
Fax: 49 (0)551 – 3851227
e-mail: rensing@www.dpz.gwdg.de

For general diagnosis of alpha-herpesviruses (cross reactions of *H.simiae*, *H.hominis* and SA8) : local medical laboratories;

for specific *H.simiae* diagnosis: National Resource Laboratory,
Dept. Biology
Viral Immunology Center
Georgia State University
50 Decatur St. or P.O.Box 4118
ATLANTA, Georgia 30302 – 4118 /USA
Phone: 404 – 651 – 0808
Fax : 404 – 651 – 0821
e-mail: biojkh@panther.gsu.edu

or:
Virus Reference Laboratories, Inc.
7540 Louis Pasteur Road
SAN ANTONIO , Texas / USA
Phone: (210) 614 – 7350
Fax: (210) 614 - 7355

Treatment

In man: Acyclovir (intracellular half life 1 – 2 hs, plasma half life 2 – 3 hs) in emergencies: 10 mg/kg dose eight hourly i.v., otherwise 800 – 1000 mg total every 4 – 6 hs ; adverse effects: reversible nephropathy, gastrointestinal disturbances, rash, encephalopathy;

Ganciclovir : (> 12 hs plasma half life) 7.5 – 10 mg/kg i.v. ; adverse effects: bone marrow suppression, renal insufficiency, rash, encephalopathy.

Valaciclovir (2 – 3 hs plasma half life, 1 – 2 hs intracellular half life) 500 – 1000 mg twice daily for 5 to 10 days; adverse effects: like Acyclovir

Foscarnet : adverse effects: renal insufficiency, electrolyte imbalance, nausea, vomiting, anaemia, seizures.

**Prevention and control in zoos**

All Asian macaque colonies have to be treated as *H.simiae*- infected, because in gang cage situations the infection is kept throughout generations. The only way to establish *H.simiae* – free colonies is by separate raising of all newborns , usually an unacceptable way due to the ensuing behavioural problems. If possible, Asian macaques, especially those recently imported, should be kept away from other nonhuman primates. For protection of the animal handlers certain measures should be taken: wearing of protective clothing, at least heavy gloves, restriction of the animals mobility before handling (anesthesia, squeeze cages etc.), if wounds are sustained: first aid immediately (*H.simiae* enters the host cells within 5 min!) :bleeding as much as possible,scrubbing with soap or detergents , iodine disinfection. In conjunctival contaminations: irrigation for at least 15 min. using sterile saline solution (no Dacon's solution!)

Suggested disinfectant for housing facilities

Lipid solvents, detergents, soap, UV-light, heat.

Notification

Notification of the supervisor after biting/ scratching lesions sustained by any nonhuman primate not also because of the *H.simiae* risk, but also because of the much greater risk of infection by anaerobe bacteria

Guarantees required under EU Legislation**Guarantees required by EAZA Zoos****Measures required under the Animal Disease Surveillance Plan****Measures required for introducing animals from non-approved sources****Measures to be taken in case of disease outbreak or positive laboratory findings****Conditions for restoring disease-free status after an outbreak****Experts who may be consulted**

- 1.Dr. J.K.Hilliard, Biology Department, Viral Immunology Center, Georgia State University, Atlanta/Georgia;
- 2.Dr.R.D.Henkel, B-virus lab . Phone 404 – 651 – 0808; Fax 404-651-0814;
- 3.Dr.N.Bernstein – Phone 540 – 899 – 1436;
4. Dr.D.Davenport – Phone : 616 – 341 – 6400.

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