HERPES B VIRUS

V14.11 OIE ☐ BALAI ☐ EU AHL ☐

VIRUS *Macacine herpesvirus 1, Herpesviridae* ZOONOSIS ☒

SUSCEPTIBLE ANIMAL GROUPS	TRANSMISSION	CLINICAL SIGNS	SEVERITY	TREATMENT	PREVENTION AND CONTROL
Asian macaques Foreign hosts: humans, African and American non-human primates (NHP)	Saliva and other body fluids Direct contact, wounds, mucous membranes, sexual transmission Fomites	In Asian macaques usually none In humans and African NHP herpes-like lesions, encephalitis	Fatal in 75-80% of humans, African and American NHP	Anti-virals: ganciclovir, valacyclovir and famciclovir Patients remain on medication for years	Protective equipment including gowns, overalls, goggles, masks and face shields Screen and remove infected animals

FACT SHEET COMPILED BY

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LAST UPDATE

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DISEASE AGENT

Macacine herpesvirus 1 (also called herpes B virus, family *Herpesviridae*) is an alphaherpesvirus cross-reacting with *Herpes hominis (*HHV1 and HHV2) and the baboon virus SA8 (Simian agent 8). Different viral genotypes with different virulence exist in different macaque host species.

SUSCEPTIBLE ANIMAL GROUPS

Causes disease in all macaques and is transmissible to humans. All non-human primates (NHP) are susceptible.

ZOONOTIC POTENTIAL

Fatal in humans after accidental transmission.

DISTRIBUTION

Worldwide in captive macaque colonies and accidentally infected humans (working with macaques) and other NHP.

TRANSMISSION

Between macaques transmission occurs primarily through infectious body fluids via food sharing, biting and sexual contact. Transmission to humans occurs via biting, scratching or contamination of mucous membranes (especially the conjunctiva) or wounds, during handling of shedding animals or contaminated animal products. Aerogenous infection is possible, but less common. Two cases were reported where the patient had no previous exposure to macaques or exposure had occurred over 10 years previously.

INCUBATION PERIOD

2 to 3 weeks, but usually 5 to 8 days (also in humans).

CLINICAL SIGNS

Infections are usually asymptomatic in macaques, but can occasionally result in dyspnea, nasal discharge, conjunctivitis, oral/perioral vesicles or self-healing skin/mucosal pustules. Newborn macaques and other non-human

primate species usually develop pneumonia and death**,** though asymptomatic infections might also occur**.**

In humans: local vesiculation, painful/pruritic erythema, lymphadenopathy, headache, myalgia, vomiting, photophobia, hyperesthesia and paresthesia, neck stiffness, confusion, ascending paralysis, and death. Possible latency of the virus.

PATHOLOGY AND POST MORTEM FINDINGS

In non-human primates: rarely oral/perioral herpetic vesicles/ulcers (syncytial giant cells, Cowdry type A intranuclear inclusion bodies); in fatal cases hemorrhagic bronchopneumonia, and hepatic, splenic and/or adrenal necrosis.

In humans: severe inflammatory and degenerative changes of the spinal cord, necrotizing ganglioneuritis/ myeloencephalitis particularly of the cervical cord and brainstem; thalamus and hypothalamus may also be affected.

DIAGNOSIS

Serology: ELISA with or without Western blot on serum/plasma. HHV1-2/AtHV1/SA8 antigens can be used. Animals can be infected and have a negative antibody titer due to low production of antibodies or high production of viral particles forming antibody/antigen complexes.

Virology: pan-herpes PCR and DNA sequence analysis conducted on infected tissue or blood; virus isolation in VERO cells or other susceptible cell lines.

SAMPLES REQUIRED FOR LABORATORY ANALYSIS

Serology: 1-2 ml serum in plastic tubes with storage and shipment at below -20°C.

Virology: swab or material from lesions in 1-2 ml viral transport medium (or other sterile solution), stored and shipped in below -80°C. For cryopreservation, medium supplemented with 10% FCS is recommended.

TREATMENT

Recommended medications include ganciclovir, valacyclovir and famciclovir. Many patients must remain on anti-viral drugs for life after exposure. FEAU (2'-fluoro-5-ethyl-Ara-U) is a new anti-viral that appears effective in cell culture but has not been used in human cases yet.

PREVENTION

All Asian macaque colonies have to be managed as *Macacine herpesvirus 1* infected, because in captive family groups the infection is often kept through generations. If possible, Asian macaques (and especially those recently imported) should be kept separated from other non-human primates.

The US Center for Disease Control and Prevention (CDC) developed guidelines to prevent herpes B virus in workers handling macaques (here). The recommendations are briefly outlined below:

a) Personnel must wear appropriate personal protective equipment including glasses and face shields, masks, long sleeve protecting clothing, and nitrile or latex gloves. If the animal is not sedated, leather gloves extending to the shoulder should be used.

b) Personnel must be trained in the associated risks of infection and appropriate response protocols.

c) Upon possible exposure, the person should immediately wash the wound or lavage the mucous membrane exposed for 15 minutes.

d) Collect baseline serum and culture samples from the person and the macaque.

e) Starting prophylaxis with an anti-viral within 24h is recommended if the case meets one of the following criteria:

- Exposure of mucosa or injured skin to an ill/immunocompromised/shedding macaque;
- Exposure of mucosa or injured skin that is not adequately cleaned;
- Laceration of the head, neck or torso;
- Deep puncture (bite, needle) associated with macaque CSF fluid, herpes-like lesions, eyelids or mucosa;
- A post-cleaning culture of wound is positive for B virus;
- A laceration is caused by an object contaminated by macaque mucosal, genital or salivary secretions.

f) Prophylaxis with an anti-viral should be considered if the case meets one of the following criteria:

- Exposure of mucosa or injured skin that has been adequately cleaned;
- A needle puncture that was associated with blood from an ill or immunocompromised macaque;
- Skin that was recently exposed to contaminated macaque body fluid or cell culture, and has been lacerated.

CONTROL

Suggested disinfectants for housing facilities: hot water with lipid solvents, detergents, soap and UV-light.

Some international institutes have created specific pathogen free (SPF) colonies of macaques, and some breeding groups have been herpes B free for over 10 years.

LEGISLATIVE REQUIREMENTS

Not notifiable under OIE 2019, BALAI (Council Directive 92/65/EEC) or AHL (Regulation EU 2016/429).

Within an institution, the supervisor should always be notified of biting or scratching lesions sustained by any non-human primates, not only because of herpesviruses but also due to a much greater risk of infection by anaerobic bacteria.

CONTACTS FOR FURTHER INFORMATION

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