



CATTLE PLAGUE or RINDERPEST

ANIMAL GROUP AFFECTED	TRANSMISSION	CLINICAL SIGNS	FATAL DISEASE ?	TREATMENT	PREVENTION & CONTROL
- wild and domestic Ruminants - Asiatic and wild pigs	- inhalation - contact (oral)	- fever - necrotic lesions of the mouth - diarrhoea	Yes	None available	<i>In houses</i> <i>In zoos</i> Avoid contact with infected animals Vaccination

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Susceptible animal groups All cloven-hoofed animals are probably susceptible. Among domestic animals cattle, water buffaloes and yaks are highly susceptible. Sheep and goats are less susceptible. Asiatic pigs are susceptible whereas European pig breeds usually undergo subclinical infection. Among wild ruminants some species are highly susceptible: African buffalo, eland, giraffe, kudu. Gnou, ourebi and impala show an intermediate susceptibility whereas small gazelles, cobs, hippopotamus are considered as less susceptible. Warthogs and bushpigs are highly susceptible. Camels are not susceptible (only subclinical disease).	
Causative organism The rinderpest virus belongs to the genus Morbillivirus (family Paramyxoviridae). It is a RNA virus, which is closely related to the measles, peste des petits ruminants and distemper viruses. There is only one serotype of rinderpest virus (3 lineages), but the virulence can vary widely. Some strains are hypovirulent and cause almost no clinical symptoms whereas others are hypervirulent. Rinderpest strains, which are responsible for mild disease in cattle, might cause severe disease in susceptible wildlife species. The virus is not very resistant and is rapidly inactivated at environmental temperatures by solar radiation and desiccation.	
Zoonotic potential The rinderpest virus is not infective to man.	
Distribution Currently, rinderpest is limited to the Somali Ecosystem in Africa. A Global Rinderpest Eradication Programme (GREP) is going on. It is coordinated by FAO and eradication is targeted for 2010.	
Transmission Close contact with an infected animal is necessary for virus transmission. Although oral transmission is possible (ingestion of contaminated feed, water or fresh, infected meat), infection is transmitted mainly by aerosol (droplets containing virus particles in the expired air) or by contact with secretions or excretions of infected animals (saliva, faeces, milk, semen, urine, vaginal, nasal or ocular discharges). Rinderpest virus is shed by infected animals during a relatively short period (about 2 weeks), but virus shedding starts already a few days before clinical symptoms appear.	
Incubation period The incubation period is maximum 21 days, but can be as short as 1 to 3 days in case of hyperacute rinderpest.	
Clinical symptoms Fever, necrotic lesions of the mouth causing salivation and diarrhoea are the major clinical symptoms of rinderpest. The evolution of the disease can be <i>peracute</i> with very few symptoms before the animal dies, <i>acute</i> with the full range of symptoms (successively fever, anorexia, depression, rapid and shallow respiration, necrotic lesions on gums, lips and tongue resulting in salivation, erosions on the nasal, vaginal mucosa and finally diarrhoea) or <i>mild</i> with less marked clinical symptoms and absence of one or more of the cardinal features. Hypovirulent strains can cause almost <i>inapparent</i> disease with as only symptom a short, transient fever whereas hypervirulent strains can cause very high mortality.	
Post mortem findings The lesions are not pathognomonic. Advanced or peracute cases will not show the typical signs. In acute cases the carcass is dehydrated and soiled with loose faeces. Erosions are present on lips, gums, dental	



pad, palate and pharynx. The rumen pillars and abomasum show congestion and necrosis. The Peyer's patches are swollen, dark and friable. Zebra striping is present in the large intestine. The nasal cavity, trachea and lungs are congested. All lymph nodes are enlarged, soft and oedematous in early cases, later they are shrunken and grey.

Diagnosis

Anamnesis, clinical and pathological signs are highly suggestive of rinderpest, but for a definitive diagnosis the virus or specific antigen or antibodies need to be demonstrated. Differential diagnosis has mainly to be made with mucosal disease in cattle (which is usually restricted to some animals in a herd) and PPR in small ruminants (absent in cattle).

1. Direct methods

a) virus isolation: lymphoid tissues or blood leucocytes from suspected animals are inoculated into cell cultures. Cytopathogenic effects appear after 3 to 12 days. Rinderpest is confirmed by different tests (i.a. virus neutralisation or direct immunofluorescence, etc)

b) Polymerase chain reaction (PCR): Reverse transcription (RT)- PCR can be used to identify rinderpest virus.

c) Antigen detection: rinderpest antigen can be demonstrated using the agar-gel immunodiffusion test (AGID), the counter-immunoelectrophoresis test, the sandwich ELISA or the chromatographic strip test. The latter test is a real pen-side test, which gives a result within 5 to 10 min. It is less sensitive than the RT-PCR and can only be used for diagnosis at herd level. Other antigen detection tests include immunohistochemical staining and electron microscopy.

2. Indirect methods: specific antibodies in serum can be detected using a monoclonal antibody based competitive ELISA or virus neutralisation test.

Material required for laboratory analysis

Whole blood (with anticoagulants), spleen, lymph node, eye swab, ocular secretions (excellent for antigen detection). Samples for virus isolation should be chilled, but not frozen. Samples should be collected from as many animals as possible, preferably in the early stages of infection (febrile or mucosal erosion phase).

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Treatment

Drugs for an effective etiological treatment are not available. Only supportive and symptomatic treatment can be initiated.

Prevention and control in zoos

Effective live attenuated vaccines are available, which give a life long immunity. New animals from endemic areas should be kept in quarantine for 3 weeks.

Suggested disinfectant for housing facilities

Lipophilic disinfectants are recommended for cleansing contaminated stables. In the presence of organic matter, the most effective disinfectants are 5% sodium hydroxide and 50% lysol.

Notification

Yes

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****Contacts for further information****References**

1. Anderson, J., Barrett, T. and Scott, G.R. 1996. Manual on the diagnosis of rinderpest. FAO, Rome, 143 pp.
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3. FAO (1996) The world without rinderpest. FAO Animal Production and Health Paper No. 129, Rome, 173 pp.
4. Kock, R.A., Wambua, J. and Mwanzia, J. (1999). Rinderpest epidemic in wild ruminants in Kenya 1993-1997. Vet. Rec. 145: 275-283
5. Rossiter, P.B.. 2004. Rinderpest In: Infectious diseases of livestock (Eds. Coetzer, J.A.W. & Tustin, R.C.). Oxford University Press, Cape Town, 2nd ed., vol.2., 629-659.