

Short communication

Early detection of viral excretion from experimentally infected goats with peste-des-petits ruminants virus

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Abstract

We observed 15 goats for 9 days after subcutaneous infection with 10^3 TCID₅₀ with isolates of peste-des-petits ruminants virus from Africa and India and five concurrent, uninfected control goats. Typical clinical signs of the infection were present in all 15 infected goats by day 8 and in most by day 6 and some signs were present by day 4. However, 6 out of 15 goats already have detectable virus shedding by day 3 and four more were shedding by day 4 and every goat had virus shedding for at least 1 day before the recognition of clinical signs. This experiment indicates that incubatory carriers therefore might play a role in the transmission of PPRV among small ruminants.

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1. Introduction

Peste-des-petits-ruminants (PPR) is a disease of sheep and goats with high morbidity and mortality; it is one of the major notifiable diseases of the World Organisation for

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Animal Health (OIE). It has a widespread distribution across Sub-Saharan Africa, the Middle-East and Southern Asia, where it still causes serious economic losses (Taylor, 1984a; Shaila et al., 1989; Diallo, 2003) and remains a major constraint on the development of small-ruminant farms in these countries. Outbreaks of PPR are recorded regularly by field technicians and farmers (mainly during the raining season) in tropical regions and are characterized by fever, erosive stomatitis, nasal and ocular discharges, pneumonia that could be exacerbated by secondary bacterial infection and diarrhoea. The severity of the clinical signs depends on the virulence of the strains (Couacy-Hymann, unpublished data).

The causative agent is peste-des-petits-ruminants virus (PPRV), a member of the Morbillivirus genus in the Paramyxoviridae family (Gibbs et al., 1979). PPRV is closely related to rinderpest virus (RPV) which infects cattle and other large ruminants and can cause disease in small ruminants (Anderson et al., 1990; Couacy-Hymann et al., 1995; Diallo, 2003). PPRV is transmitted from infected animals to naïve ones by close contact because it is readily inactivated in external conditions. The oral and respiratory tracts are the main routes of virus transmission through oral, nasal and ocular excretions and the virus is rapidly inactivated in dead animals. There is no chronic or convalescent carrier form of this infection.

However, rinderpest (RP) virus (RPV) is shed by incubatory carriers (Plowright, 1968; Scott et al., 1986). Such carriers contribute to the transmission of RPV. Because RPV and PPRV are closely related, our objective was to investigate whether PPRV was shed prior to clinical signs of PPR in infected goats.

For this purpose, 20 West African dwarf goats, aged between 2 and 3 years and weighting between 12 and 15 kg, were purchased from villages located in the rain forest region and tested as negative for the presence of antibodies against RP and PPR by the virus-neutralization test (Rossiter and Jessett, 1982; Taylor, 1984b). Each group was housed in its own cage with its own feeding and drinking tanks. Each animal was treated (300 mg/kg) with Albendazole, an anti-parasite drug, during the acclimatisation period. Five virus isolates were used for the challenge. They were obtained from the virus bank of CIRAD/EMVT, Montpellier, France and represented different geographical regions within Africa and India: Côte-d'Ivoire 89 (CI89); Conakry Guinea (CG); Nigeria 75/1 (NIG 75/1); Sudan-Sennar (SS); India-Calcutta (IC).

We used a table of random numbers to divide the 20 goats into six groups: five groups each of three goats and one control group of five goats. Each animal (except controls) was infected subcutaneously with 1 ml of the various challenge viral suspensions, at a concentration of 10^3 TCID₅₀ ml⁻¹. Each group of animals were kept separately in an 8-m² specific-cage, in the laboratory-animal house. Each cage was identified with a specific number and had a separate attendant blindly assigned to feed and water the animals. Animals were examined daily and rectal temperature was daily recorded. All infected and control animals were slaughtered at 9 day. The first author was certificated in 2004 by the International Committee for Laboratory Animal Sciences (ICLAS).

Nasal, ocular (conjunctival) fluids and saliva were collected daily using cotton swabs from all challenged animals from day 1 to day 9 post-infection. Samples also were collected from the controls on day 5 and 9. All samples were stored at -80 °C until examined. These samples were processed blinded to the treatment group, at the end of the experiment, for RNA extraction using the Qiagen RNA Extraction kit (Qiagen, RNEasy

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