**Natural Bluetongue virus infection in alpacas in South Africa**

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**Summary**

Bluetongue virus (BTV) was sporadically isolated over a four year period (2010-2014) from several alpaca carcasses that were presented for necropsy at the Western Cape Provincial Veterinary Laboratory, South Africa. Typically, the affected animals had a history of acute dyspnoea and progressive weakness before death. Consistent hydrothorax and severe lung oedema in all lead to a preliminary diagnosis of Bluetongue, despite the absence of ulceration and hyperaemia of the oral mucosa which is characteristic of this viral infection in sheep. The diagnosis was confirmed by virus isolation in embryonated eggs and subsequent sequencing of the extracted RNA. Assembled sequences were subjected to Blast analysis and two of the isolates could be verified as BTV 3. These cases, originating from the Western Cape Province of South Africa, represents the first official report of BTV infection in alpacas in Africa and demonstrates the susceptibility of the species to this disease when maintained in BTV endemic areas.

**Keywords**

Alpaca, Bluetongue virus, Pathology.

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**Infezioni naturali da virus della Bluetongue in alpaca del Sudafrica**

Parole chiave

Alpaca, Patologia, Virus della Bluetongue.

**Riassunto**

Il virus della Bluetongue (BTV) è stato isolato sporadicamente, nell’arco di 4 anni, in diverse carcasse di alpaca sottoposte ad esame necroscopico al Western Cape Provincial Veterinary Laboratory in Sudafrica. Gli animali esaminati hanno mostrato dispnea e crescente debolezza prima della morte. La Bluetongue è stata diagnosticata in tutti gli animali esaminati, vista la presenza di idrotorace e grave edema polmonare, nonostante l’assenza di ulcerazione e iperemia della mucosa orale che è caratteristica dell’infezione negli ovini. Questa diagnosi è stata confermata dal successivo isolamento del virus in uova embrionate e dal sequenziamento dell’RNA virale. La Blast (Basic Local Alignment Search Tool) analisi condotta sulle sequenze assemblate ha permesso di identificare il sierotipo 3 del BTV. Questi casi circoscritti alla provincia di Western Cape in Sudafrica rappresentano il primo rinvenimento ufficiale di infezioni da BTV in alpaca in Africa e dimostrano la suscettibilità di questa specie in aree in cui il virus è endemico.

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In South Africa (SA) Bluetongue virus (BTV) infection is primarily a disease of sheep with a seasonal occurrence. Unvaccinated (or susceptible) sheep frequently develop disease towards the end of Summer or during Autumn. Other ruminants, including exotic species such as alpaca, may also sporadically contract the disease. Since 2010, 4 BTV isolates (of which 2 could be typed as BTV-3) were found in sub-adult to mature alpacas that had been presented for necropsy examination at the Western Cape Provincial Veterinary Laboratory, SA.

The clinical and pathological phenotype observed in the affected animals included acute onset of respiratory distress, which rapidly progressed within hours to weakness and terminal dyspnoea.
On presentation cyanotic mucus membranes were noted and foamy bloodstained fluid was oozing from their nostrils. All cases revealed a marked hydrothorax with congested, firm rubbery and heavy lungs that did not collapse when opening the thorax. Copious amounts of foam in the trachea and larger bronchioles (noted on cut sections of the lungs) confirmed severe pulmonary oedema.

Histological examination of the pulmonary tissue confirmed the presence of extensive protein-rich oedema that widened the interstitium and flooded the alveoli. Diffuse vascular congestion and multifocal, scant perivascular accumulates of lymphocytes and plasma cells were noted.

Bluetongue virus was successfully isolated from splenic tissue homogenates using intravenously inoculated, embryonated chicken eggs. Cherry-red and oedematous embryos were observed, which died from days 3-5 post inoculation. The presence of BTV was confirmed by real time reverse transcriptase polymerase chain reaction (RT-PCR). Further characterization of the specific isolates was performed by means of molecular serotyping and analysis of sequencing data. Briefly, the following approach was taken: embryo material was passaged in BHK-21 cells grown in Eagle’s minimum essential medium containing 1% fetal bovine serum (FBS).

References


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