COXIELLA BURNETII ASSOCIATED PLACENTAL LESIONS IN PARTURIENT CATTLE

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Q fever is a worldwide occurring infection in animals and man. Domestic ruminants play a major role in the epidemiology of human Q fever as they may excrete the organism in e.g. cases of abortion and at parturition. The bovine infection is rarely associated with reproductive problems as e.g. stillbirths, which might be explained by a non-significant host-pathogen interaction in the placenta.

The aim of the present study was to investigate if placental infection in parturient cattle is associated with inflammation.

Cotyledonary specimens (n = 170) from Danish dairy cattle originating from 19 herds were analysed for Coxiella burnetii by rt-PCR targeting the IS1111a and icd genes. Positive cases (n = 90) and a random selection of negative cases (n = 20) were examined by histology, immunohistochemistry (IHC) and if the infection level was high, also by fluorescence in situ hybridization (FISH). Bulk tank milk (BTM) samples obtained through the sampling period were analyzed for antibodies.

The prevalence of rt-PCR positive cotyledonary samples per herd varied from 0 to 73% (mean 18%). The prevalence was generally higher in herds with antibody positive BTM than in herds with negative BTM. Histology revealed a range of mostly minor lesions. IHC revealed one case with IHC positive granules within trophoblasts; the one with the highest rt-PCR value. Inflammatory or degenerative lesions were not observed in association with infected trophoblasts. Blinded examination of placental sections did not reveal obvious associations between lesions, but statistical analyses showed associations between certain (mild) lesions and the rt PCR values for IS1111a. The study demonstrates that although the placenta of parturient cattle may be infected with C. burnetii, lesions are mild and not necessarily directly associated with the infection. The infection level is generally too low to be detected by IHC and FISH. The lack of significant lesions may explain why bovine infections with C. burnetii apparently are not associated with reproductive problems as e.g. stillbirths. The lack of inflammation might be due to the bacteria being in a dormant stage. A dormant stage in combination with low levels of infection in the placenta may be a part of the explanation of why cattle are rarely associated with human cases of Q fever.