Abstract

Bartonella quintana is transmitted by the infected faeces of body lice. Recently, this bacterium was detected in cat fleas (Ctenocephalides felis) and in two humans with chronic adenopathy whose only risk factor was contact with cat fleas. In this study, a total of 960 C. felis were divided into 12 groups (2 control groups and 10 infected groups) each containing 80 fleas. The fleas were fed B. quintana-inoculated human blood at different dilutions (≈3.6×10^4 - 8.4×10^9 bacteria) for 4 days via an artificial membrane. Subsequently, all flea groups were fed uninfected blood until day 13 postinfection (dpi). On day 3 pi, B. quintana was detected with two specific genes by quantitative PCR in 60-100% of randomly chosen fleas per dilution: 52% (26/50) in the infected fleas in Trial 1 and 90% (45/50) of the fleas in Trial 2. B. quintana was also identified by molecular and culture assays in flea faeces. The average number of B. quintana as determined by qPCR decreased until the 11th dpi and was absent in both trials at the 13th dpi. Bacteria were localized only in the flea gastrointestinal gut by specific immunohistochemistry. Our results indicate that cat fleas can acquire B. quintana by feeding and release viable organisms into their faeces. Therefore, fleas may play a role as vectors of trench fever or other clinical manifestations that are caused by B. quintana. However, the biological role of C. felis in the transmission of B. quintana under natural conditions is yet to be defined