

Antiviral effects of bovine lactoferrin on human norovirus

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Abstract

Human noroviruses cause significant morbidity and mortality worldwide, but lack approved antivirals or vaccines to treat or prevent infections. The recent development of two cell culture systems in human transformed B cells (BJABs) and non-transformed human intestinal enteroid cultures overcomes a main limitation in identifying molecules with anti-norovirus activities. Lactoferrin is an iron-binding glycoprotein found in the milk of most mammals, with broad spectrum antimicrobial activities, including against the related murine norovirus in cell culture. In a Japanese clinical trial, ingestion of lactoferrin reduced the incidence of infectious gastroenteritis in the participants. Because human noroviruses were the most common cause of gastroenteritis in Japan during the clinical trial period, we sought to determine whether lactoferrin could inhibit infection with human norovirus. Our study, using a B cell culture model, demonstrates that lactoferrin reduces human norovirus infection. The mechanism of antiviral action is likely indirect and may involve the induction of innate interferon responses. Therefore, future studies are warranted to test the antiviral efficacy of lactoferrin against human norovirus infection in patients.

Keywords: cellule B humaine; human B cell; human norovirus; interferon; interféron; lactoferrin; lactoferrine; norovirus humain.