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Andes-virus-induced cytokine storm is partially suppressed by ribavirin

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Abstract

Background: Microbe-induced over-activation of cytokines, especially tumour necrosis factor (TNF)- α , is key to the pathogenesis of hantavirus infection leading to severe inflammation with high mortality rate. Although ribavirin showed promise in inhibiting viral replication in vitro, its clinical efficacy remains controversial. Methods: Various concentrations of ribavirin were used to determine its effect on cytokine activation in our infectious model system. Results: Ribavirin decreased the virus load and dosedependently inhibited the accumulation of RANTES messenger RNA in Andes-virus (ANDV)-infected human endothelial cells, but failed to suppress TNF- α -induced activation of RANTES and interleukin-6 in ANDV-inoculated cultures. This report also shows, for the first time, that the deleterious over-stimulation by TNF- α is mediated by nuclear factor- κ B, and describes the effect of ribavirin on cytokine production following ANDV infection. Conclusions: Although highly effective in preventing ANDV replication and suppressing activation of select inflammatory mediators, the therapeutic efficacy of ribavirin is limited due to its inability to fully inhibit cytokine outburst triggered by hantavirus infection. © 2013 International Medical Press.

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