

Nitric oxide trigger apoptosis in the brains in Border Disease

Border disease is a pestivirus infection accompanied by central nervous system (CNS) and skeletal abnormalities in sheep and goats. Affected fetuses and newborn animals exhibit brain disorders.

This study investigated the relationship between the severity of the neurohistopathological changes observed in the brain tissues of lambs and goats that were naturally infected with border disease virus (BDV) and the apoptotic and anti-apoptotic mechanisms involved. A second aim was to study the relationship between virus-mediated-induced apoptosis in the CNS and nitric oxide (NO) expression.

In this study, we obtained new information on the relationship between BDV, apoptosis, and NO. We demonstrated for the first time that apoptosis in the CNS was triggered by the BDV. In addition, the apoptotic pathway did not involve the cytokine receptor-mediated extrinsic pathway, and NO was released in high amounts in infected animals. Given that apoptosis is induced in neuronal and neuroglial cells by the effect of increased levels of NO in BDV-infected cells can be thought of as a model of similar other viral diseases that affect the fetus during pregnancy.

This study showed that BDV pathologically increased the expression of eNOS and iNOS in the brain; therefore, high amounts of NO were found to trigger apoptosis through the intrinsic pathway by causing mitochondrial damage. A critical increase in endothelial eNOS and iNOS activities was noted in cases with high levels of BDV antigen. Our results showed that high levels of NO were released from neurons and endothelial and glial cells by the BDV infection. In addition, cases with severe iNOS reactions in the veins showed increased levels of intravascular lymphocytes and other inflammatory cells; eNOS and iNOS were released in a similar way in these cells. Therefore, not only neurons, glia, and endothelial-derived cells, but also lymphocytes and neutrophils, which are thought to be potentially recruited to the area, may contribute to the infection.

Publication

[eNOS and iNOS trigger apoptosis in the brains of sheep and goats naturally infected with the border disease virus.](#)

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