ABSTRACT

TITLE:	How Can Hantaviruses Kill Humans but Leave Mice Unaffected: An Evaluation of the Immune Response of Deer Mice to Sin Nombre Virus
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ABSTRACT: Sin Nombre Virus (SNV) is a hantavirus that causes high mortality (>38%) in humans. Deer mice (Peromyscus maniculatus) are the primary host of SNV, and unlike humans, deer mice infected with SNV have few outward signs or symptoms of disease. The reasons for such asymptomatic infection in deer mice of have not been well studied; however, this information may be useful in uncovering therapies that could reduce human SNV mortality. Therefore, the objective of our study was to evaluate the pathology of SNV infection in deer mice by examining their patterns of white blood cell production. We quantified the number of lymphocytes, eosinophils, basophils, neutrophils, and monocytes produced by wild deer mice in both the early and late stages of SNV infection. Deer mice captured in the early season had greater basophil, lymphocyte, and eosinophil levels compared to deer mice captured in the late season. Conversely, monocyte levels were greater in deer mice captured in the late season. SNV infection status appeared to influence production of both neutrophils and monocytes, with SNV-infected mice having greater neutrophil levels but lower monocyte levels than uninfected mice. Collectively, our results seem to support the notion that immune stressors faced by wild deer mice shift from early to late season, and these differences are reflected by differential leukocyte production that occurs across seasons. Furthermore, our results suggest that wild deer mice may have a more similar immune response to SNV infection to humans, albeit a substantially more tempered response, than previous studies have recognized.