

Activation of the innate system by *Acanthamoeba* spp. in the eyes of mice with disseminated acanthamoebiasis through TLR2 and TLR4

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Disseminated acanthamoebiasis occurs mostly in patients with low immunity system, including patients with HIV or after organ transplantation. Course of the infection in this group of patients is rapid and usually leads to death. The scientific literature notes the presence of *Acanthamoeba* spp. in the liver, kidneys, adrenal glands, and bones of patients with disseminated acanthamoebiasis. The aim of this study was to determine the expression of Toll-like receptors 2 (TLR2) and 4 (TLR4) in the eyes of mice following intranasal infection with *Acanthamoeba* spp. in relation to the host's immunological status. Amoebae used in this study were isolated from the bronchial aspirate of a patient with acute myeloid leukemia (AML) and atypical symptoms of pneumonia. BALB/c mice were divided into 4 groups: immunocompetent infected with *Acanthamoeba* spp. (A; n=20), immunocompetent uninfected (C; n=16), immunocompromised infected (AS; n=20) and immunocompromised uninfected (CS; n=16). Animals from the AS and CS groups were given methylprednisolone intraperitoneally. Mice were sacrificed at 8, 16 and 24 days post infection (dpi). The expression of TLR2 and TLR4 was examined using reverse transcription polymerase chain reaction and measured by quantitative real-time polymerase chain reaction. We found statistically significant differences in the expression of TLR2 and TLR4 in the eyes of immunocompetent mice at 8, 16, and 24 dpi compared to control group. Immunosuppressed mice showed significant differences in the expression of TLR2 at 16 and 24 dpi compared to uninfected animals. Our results indicate that TLR2 and TLR4 are upregulated in the eyes of mice in response to *Acanthamoeba* spp. We suggest that it is possible for trophozoites to migrate through the optic nerve from the brain to the eyes. The course of disseminated acanthamoebiasis may be influenced by the host's immunological status, and the observed changes in expression of TLR2 and TLR4 in the host's organs may indicate the role of these receptors in the pathomechanism of acanthamoebiasis.