THE EFFECT OF *TOXOPLASMA GONDII* STRAIN VARIABILITY ON PULMONARY IMMUNOPATHOLOGY

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Toxoplasma gondii exhibits a genetically diverse population structure, particularly in Latin America. In Brazil, atypical strains have been identified, characterized by key virulence factor polymorphisms. Most immunological studies focus on archetypal strains, leaving atypical effects unexplored. This study aimed to compare the impact of infection with different *T. gondii* strains in mice. Male BALB/c mice were infected with either the atypical strain TgCkBrRN2 (CK2), isolated in Rio Grande do Norte, Brazil, or the archetypal strain ME49. Throughout the infection, animals were monitored for mortality and morbidity. Blood samples were collected for cytokine quantification, and bronchoalveolar lavage (BAL) fluid was analyzed using multiparametric flow cytometry. Additionally, BAL supernatant was used for surfactant protein quantification via ELISA. Infection with the atypical strain CK2 induced a more inflammatory profile, characterized by elevated IL-12 and TNF levels and reduced systemic IL-10 compared to infection with the clonal ME49 strain. During the acute phase, alveolar macrophages underwent apoptosis, accompanied by pronounced inflammatory infiltration. Dimensionality reduction and machine learning analyses revealed a lack of alveolar macrophage repopulation in the chronic phase, a phenomenon more pronounced in CK2-infected mice. Functionally, infected mice exhibited surfactant accumulation in the lungs, with more severe alterations observed in those infected with the atypical strain CK2. Our findings demonstrate that strain-specific differences can significantly influence disease outcomes. The exacerbated inflammatory response and persistent lung dysfunction observed in CK2-infected mice suggest that atypical strains may contribute to more severe respiratory complications in toxoplasmosis. Understanding these strain-specific effects is crucial for refining disease models and developing targeted therapeutic strategies.

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