Abstract

Newcastle disease virus, the main cause of this disease in birds, is one of the most important viral pathogens in the poultry industry and causes extensive economic losses worldwide. The virus is a member of the Paramyxovirinae family and although it has nine serotypes, all known isolates are classified as serotype one. The pathogenicity of Newcastle disease virus depends on factors such as tissue affinity, ability to evade the host immune system and replication efficiency. Severe strains of this virus can cause 100% mortality in susceptible flocks. Immunologically, NDV stimulates the expression of inflammatory cytokines, especially interferons and interleukin-6. The intensity of the immune response varies depending on the virus strain and the host species.

In the present study, the expression of interleukin 1 beta, interleukin 6, interferon gamma and interferon alpha was investigated in experimental infection with Newcastle disease virus in Japanese quail. For this purpose, 60 one-day-old quails were prepared and divided into two control and treatment groups. In the treatment group, 36 quails were exposed to 150 µl of live Newcastle disease virus through the ocular-nasal route, while the control group received 150 µl of phosphate buffered saline through the same route. Birds in both groups were maintained under standard conditions and monitored daily. Sampling was performed from the fifth day after infection for four consecutive days and seven birds were examined daily. Real Time PCR was performed on the brain, lung, liver and spleen to evaluate the expression of the desired cytokines and virus replication. The results showed that the expression of interleukin 1 beta, interleukin 6, interferon gamma and interferon alpha was altered in various organs, especially the brain. Virus replication in the brain began on the fifth day, increased until the middle of the study, and then showed a decreasing trend. The findings indicate the ability of Newcastle virus to replicate in Japanese quail and stimulate its immune system, although this replication does not necessarily lead to clinical symptoms.

Keywords: Interleukin-1β, Interleukin-6, Interferon-γ, Quail, Newcastle Disease Virus (NDV)