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Toll like receptor 3 and 9 are up-regulated in the hospitalized COVID-19 infected patients

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Background: It has been demonstrated that pro-inflammatory responses are the main causes of novel coronavirus (COVID-19)-related complications. The aim of this project was to explore the roles played by toll like receptors (TLRs), including TLR3, TLR7, TLR8 and TLR9, in the pathogenesis of COVID-19.

Methods: In this study 30 COVID-19 infected patients and 30 age and sex match healthy controls were evaluated. The patients were selected from the hospitalized patients in the Ali-Ibn Abi-Talib hospital, Rafsanjan, Iran, with positive real-time PCR test for COVID-19. The patients with smoking, opium consuming, autoimmunity, and allergy, infectivity with other viruses and bacteria and receiving immune suppressor drugs have excluded from the study. The sampling was performed at the starting of hospitalization and before starting the treatment. Blood samples were collected in pre-coated anti-coagulant agents tubes. mRNA levels of TLR3, TLR7, TLR8 and TLR9 were evaluated using Real-Time PCR technique.

Results: Relative expression of TLR3 and TLR9 significantly increased in the COVID-19 infected patients in comparison to healthy controls. Male patients had higher mRNA levels of TLR3 than women.

Conclusion: Based on the results, it appears that TLR3 and TLR9 are more important than TLR7 and TLR8 against COVID-19 and may participate in the pro-inflammatory-based pathogenesis of the virus.

Keywords: Toll like receptor; COVID-19; Inflammation