IMMUNE RESPONSE TO SARS CoV2 INFECTION BY TLR3, TLR4 AND TLR7 GENE EXPRESSION.

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Abstract

Toll-like receptors (TLRs) may be involved both in the initial failure of viral clearance and in the subsequent development of severe clinical manifestations of COVID-19, essentially ARDS (acute respiratory distress syndrome) with fatal respiratory failure. We present the gene expression of TLR 3, 4, and 7 in nasopharyngeal total RNA samples from 150 individuals positive for SARS Cov2 (DET) by molecular techniques of isothermal amplification (Neokit SA) and 152 SARS Cov2 non detectable (ND) ambulatory and hospitalized patients with a non-defined respiratory disease, and we compared with the symptomatology developed by all those patients. We analyzed 4 cohorts: 1-SARS Cov2 genome detected patients with severe to high symptomatology (n=107); 2-SARS Cov2 genome detected patients low to mild symptomatology (n=43); 3-SARS Cov2 genome non detected patients with severe to high symptomatology (n=109); and 4-SARS Cov2 genome non detected patients low to mild symptomatology (n=41). Our results not only contradict few previous study, it also corrects for sample size bias, showing no significant differences of expression for TLR3, TLR4 and TLR7 between SARS Cov2 DET and ND total cohort of patients (Non Paired T –Test p Value>0.1). When compared severity of symptoms -presence of symptoms from the COVID-19 12 WHO diagnosis symptoms- and gene expression, here we found significant positive correlation between severe symptomatology, and the number of symptoms and death for TLR4 and TLR7 for both DET and ND COVID-19 patients. When the cohort was construct with low/middle and severe symptoms, the Correlation Coefficient showed that expression of TLR4 and TLR7 was significantly amplified in those ND patients with severe symptomatology (p *Value*= 0.00311) as well as for TLR3 in ND low to mild symptoms cohort of patients. We also showed and discussed the results obtained of these genes expression and the sex and age of patients. In summary, our data suggest that although our innate immune system with TLRs contributes to the elimination of viruses, it can also be associated with harm to the host due to persistent inflammation and tissue destruction. We confirmed that principally TLR4 and TLR7 could be involved not only in the pathogenesis of COVID-19 but also in other respiratory diseases with same symptomatology. We agree with previous studies that treatments focus on TLR4 and TLR7 expression in inflammatory respiratory diseases could be a start point against severe symptoms development.

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