Worldwide ACE (I/D) polymorphism may affect COVID-19 recovery rate: an ecological meta-regression

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Abstract

With the emergence of the Novel Coronavirus (2019-nCoV), researchers worldwide have started detecting the probable pathogenesis of the disease. The renin-angiotensin system (RAS) and angiotensin-converting enzymes have received a good deal of attention as possible pathways involved in 2019-nCoV pathogenesis. As the experiments seeking to find potential medications acting on these pathways are being conducted in the early phases, having an ecological worldview on the relationship between the prevalence of COVID-19 disease and the genetic differences in the genes involved in the RAS system could be valuable for the field. In this regard, we conducted a meta-analysis study of the prevalence of ACE (I/D) genotype in countries most affected by the COVID-19. In the meta-analysis, 48,758 healthy subjects from 30 different countries were evaluated in 116 studies, using the Comprehensive Meta-analysis software. The I/D allele frequency ratio was pooled by a random-effect model. The COVID-19 prevalence data of death and recovery rates were evaluated as the latitudes for the meta-regression analysis. Our results demonstrated that with the increase of the I/D allele frequency ratio, the recovery rate significantly increased (point estimate: 0.48, CI 95%: 0.05-0.91,p = 0.027). However, there was no significant difference in the case of death rate (point estimate: 1.74, CI 95%: 4.5-1.04,p = 0.22).
This ecological perspective coupled with many limitations does not provide a direct clinical relevance between the COVID-19 and RAS system, but it shows potential pathophysiological associations. Our results raise concerns about ethnic and genetic differences that could affect the effectiveness of the currently investigated RAS-associated medications in different regions.

Keywords

KeyWords Plus:CONVERTING-ENZYME GENE; GENOTYPE