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Role of NLRP3rs10754558 and NOS3rs1799983 genetic polymorphisms in smoking and nonsmoking COPD patients

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Abstract

Chronic Obstructive Pulmonary Disease (COPD) is a chronic inflammatory disease leading to structural abnormalities in the airways. Mortality and disability in COPD cases are high, causing an intense economic burden. This study aims to investigate the relationship between NLRP3 rs10754558 and NOS3rs1799983 polymorphisms and the risk of COPD. This work was carried out on 152 subjects classified into Group I, with 38 COPD patients who are smokers, Group II 38 nonsmoker COPD patients, Group III 38 healthy smokers, and Group IV with 38 healthy nonsmokers. Genotyping of NLRP3rs10754558C/G and NOS3rs1799983G/T polymorphisms was assayed by real-time PCR. For NLRP3rs10754558 polymorphism, significantly higher frequencies of G/G genotype versus C/C were evident in COPD patients more than controls ($p \leq 0.001$). Also, G allele can increase the risk of COPD by (OR) 95% CI [2.498 (1.521–4.101)]. Higher frequencies of mutant G/T and T/T genotypes of NOS3 rs1799983 versus G/G in COPD patients (48.7% and 17.1%) were more than the values evident in controls ($p = 0.004$ and 0.005). T allele can also increase the risk of COPD by (OR) 95% CI [2.457 (1.491–4.049)]. Conceivable LD was evident between both polymorphisms in COPD patients and controls. No significant difference between the severity of COPD was detected by the GOLD staging and the studied polymorphisms variants in the COPD group ($p = 0.441$ and 0.83). Coding polymorphisms in NLRP3 and NOS3 can be associated with the hazard of COPD and the probability of cigarette smokers suffering the studied polymorphisms to develop COPD.

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Biography

Amudha Ondiveerappan completed MD at Windsor University School of Medicine at St Kitts & Nevis in 2007. Completing MPH in November 2020 at Walden University, located in Minneapolis, Minnesota. Born in New York City and living in Chicago, IL, since 2005.

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