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ANALYSIS OF THE ROLE OF GENETIC POLYMORPHISMS OF INNATE IMMUNE SIGNALING FACTORS IN INFLAMMATORY DISEASE**Gurumoorthy Kaarthikeyan**

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Periodontitis is a chronic inflammatory disease of multifactorial etiology. The gram negative anaerobes are the main etiological agents in causing periodontal destruction. The genetic risk factors plays a major role in determining the susceptibility to periodontal disease. The virulence factors of these anaerobes like lipopolysaccharide (LPS) are screened by the pattern recognition receptors like Toll like receptors and innate immune signaling cascade is activated. This signaling cascade is regulated by many microRNAs like *miR146a*. This *microRNA146a* negatively regulates TLR4 pathway by blocking interleukin 1 receptor associated kinase (IRAK1), TNF receptor associated factor (TRAF6). This *miR146a* is in turn regulated by apolipoprotein E (apoE). ApoE is a major cholesterol carrier and plays an important role in maintaining lipid homeostasis. ApoE selectively regulates TLR4- and TLR3-mediated signaling. The apoE may suppress the Th1 immune response by modulating IL-12 production. The inactive pro inflammatory cytokine IL-1beta secreted by this signaling cascade is activated by Nod like receptors called *NLRP3* in cytoplasm. The genetic changes of these signaling and regulatory factors of innate immune system might determine the susceptibility to periodontal destruction. Thus the aim of this study was to determine the association of the genetic polymorphisms of *miR146a*, apoE and *NLRP3* with periodontitis in south Indian population. The study was approved by the institutional ethics committee of Saveetha university (017/10/2013/IEC/SU). The study included three groups- chronic periodontitis group (n=81), aggressive periodontitis group (n=80) and healthy controls (n=167). After getting informed consent, five ml of venous blood was collected by veinpuncture. DNA extraction was done according to modified Millers et al technique. The gene polymorphisms of *miR146a* (rs2910164), *NLRP3*(rs10802501, rs10754558), apoE was analyzed using specific primers in real time PCR.

Conclusion: Thus our study concludes that the allelic frequency of *NLRP3*(rs 10802501), *miR146a* (rs 2910164) and apoE polymorphisms were associated with periodontitis in south Indian population. The biological plausibility of this association has to be analysed with further studies.

BIOGRAPHY

Gurumoorthy Kaarthikeyan is working at Saveetha Dental College since 2007. He is currently holding the designation as Professor and Clinic Head (UG) of the Department of Periodontics. He is the Co-ordinator for implant approval committee and he is the Member of Scientific Review Board –Saveetha University. He has 37 publications in various international and indexed journals. He has delivered guest lectures at various national and international conferences. He is a Reviewer and Editorial Board Member in various journals.

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