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Gene-gene interaction and contrast analysis in Indian age-related macular degeneration pathology

Suresh Kumar Sharma¹, Kaushal Sharma³, Neel Kamal Sharma², Ramandeep Singh³ and Akshay Anand

¹Panjab University, India

²National Eye Institute, NIH, USA

³Post Graduate Institute of Medical Education and Research, India

Background: Age-related macular degeneration (AMD) is characterized by irreversible vision loss in the elderly population due to the degeneration of macular photoreceptors. Various genetic as well as environmental factors have been associated with the AMD pathology.

Aim: The study was aimed to investigate the genetic interaction between various genetic components (e.g. LIPC, APOE, TIMP-3, HTRA1, IER-3, SLC16A8, B3GALT1, and ADAMTS9) and alteration in protein expression by changing in genetic makeup.

Methods: Around 350 participants (both AMD and controls) were recruited in the study to examine the interaction between various SNPs and per unit alteration in protein expression by changing the genetic makeup of respective genes. Genetic interaction between studied SNPs was analyzed by interaction analysis. Moreover, changes in per unit expression of protein levels were calculated by the contrast analysis.

Results: Results have demonstrated the significant interaction between APOE (rs769449) and HTRA1 (rs11200638) genetic loci in AMD pathology. Similarly, the results of contrast analysis have also shown the significant changes in per unit LIPC levels by changing 'CC' to 'GG' genotype. Further, we are looking forward to the multivariate analysis of variance/covariance to observe overall changes in gene expressions levels (combined for all) in AMD and Controls, with or without the presence of one or more covariates.

Conclusion: The results of the study suggested the complex genetic network in Indian AMD pathology consequently can alter the protein expression with the pathology progression.

Biography

Suresh Sharma completed his PhD in 1994, from Panjab University, Chandigarh, India and at present working as Professor, Department of Statistics Panjab University, Chandigarh, India. He was Chairperson of Department of Statistics from 2006 to 2009 and also Coordinator, Centre for Systems Biology and Bioinformatics from March 2010 to 30th June 2018. His areas of interest include Biostatistics, Ranking and Selection, Statistical Inference, Statistical Modelling, Bioinformatics, and Statistical Genetics. He has published more than 85 Research Papers in National/International Journals of repute. He has many awards to his credit, Best Research Award 2003, Jacob Wolfowitz Award 2003, USA, SG Gaur Award, 2010, Best paper in Environmental Health 2010 etc. Recently, he has been appointed Advisory Board member of the London School of Management Education (LSME), UK and Advisor, International Medical Olympiad Association, Greece. Eight Students have completed their PhD under his guidance and five others are enrolled at present.

ssharma643@yahoo.co.in

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