Abstract Title

Biochemical role of FOXP3 polymorphism in assessment of pre-eclampsia pathogenesis

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Abstract

Pre-eclampsia is a multifactorial pregnancy disorder associated with high blood pressure and proteinuria, which develop after the 20th week of pregnancy. With the prevalence of 2-7%, pre-eclampsia is responsible for more than 70,000 maternal and around 500,000 fetal deaths per annum. If left untreated, it leads to severe dysfunctions like hemolysis, shortness of breath, edema, liver and kidney dysfunction, blurred vision, restricted placental growth, and ultimately eclampsia. The polymorphism in the FOXP3 gene leads to the suppression of Treg cells, which leads to weak immunity. The etiology and pathogenesis of pre-eclampsia are associated with numerous risk factors, such as occupational, environmental, and genetic. Despite of the extensive studies carried out on the genetic association of pre-eclampsia; the pathogenesis is still an enigma. Previous investigational studies have been reported the involvement of different variants of FOXP3 gene in the inducement of pre-eclampsia by dysregulating Treg cells. In this study we performed FOXP3 (rs2232365) genotyping and biochemical analytical investigations in pregnant women to determine the association of FOXP3 polymorphism with prevalence of pre-eclampsia. We genotyped a single variant of FOXP3 (rs2232365) by Tetra ARMS-PCR method and found that rs2232365 A/G variant has significant association with pre-eclampsia under overdominance model [OR=1.89, CI 95% = 0.99-3.60, $P < 0.05$] when controls and mild pre-eclampsia were compared. Whereas, no significance was found under codominance [OR=0.64, CI 95% = 0.77-3.25, $P > 0.05$], dominance [OR=1.10, CI 95% = 0.58-2.09, $P > 0.77$], and recessive models [OR=1.00, $P > 0.05$]. Whereas, in mild and severe pre-eclampsia patients no association was found in any model ($P > 0.05$). Furthermore, in heterozygous genotype (A/G) of FOXP3 (rs2232365), we found a significant increase in the levels of clinical and biochemical markers in mild and severe pre-eclampsia patients, including systolic BP ($P < 0.05$), diastolic BP ($P < 0.05$), ALP ($P < 0.05$), AST ($P < 0.05$), ALT ($P < 0.05$), serum creatinine ($P < 0.05$), platelets count ($P < 0.05$), whereas no significant difference was found in the means of heterozygous and homozygous genotypes of protein urea ($P > 0.05$), uric acid ($P > 0.05$) and hemoglobin ($P > 0.05$). In conclusion, our study reported that FOXP3 (rs2232365) heterogeneous genotype (A/G) has strong association with altered biochemical parameters in pre-eclampsia. Thus, the participants with FOXP3 (rs2232365) (A/G) variants are more prone to develop pre-eclampsia, and is considered a substantial risk factor for pre-eclampsia.

Recent Publication(s)

1. **AKASH MSH***, Sumbal R, Rehman K, Ibrahim M, Imran M, Assiri MA. Biochemical Activation and Regulatory Functions of Trans-Regulatory KLF14 and Its Association with Genetic Polymorphisms. ***Metabolites***. 2023, 13(2): 199. https://doi.org/10.3390/metabo13020199. (**IF= 5.581, *Corresponding author**).

2. Mallhi TH, Shahid M, Rehman K, Khan YH, Alanazi AS, Alotaibi NH, **AKASH MSH***, Butt MH. Biochemical Association of MTHFR C677T Polymorphism with Myocardial Infarction in the Presence of Diabetes Mellitus as a Risk Factor. ***Metabolites***. 2023; 13(2):251. https://doi.org/10.3390/metabo13020251. (**IF= 5.581, *Corresponding author**).

3. Yaqoob A, Rehman K, **AKASH MSH***, Akash MSH, Alvi M, Shoaib SM. Biochemical profiling of metabolomics in heavy metal-intoxicated impaired metabolism and its amelioration using plant-based bioactive compound. ***Front Mol Biosci***. 2022; 9:1029729. https://doi.org/10.3389/fmolb.2022.1029729. (**IF= 6.113, *Corresponding author**).

4. Alvi M, Rehman K, **AKASH MSH***, Akash MSH, Yaqoob A, Shoaib SM. Determination of metabolomics profiling in BPA-induced impaired metabolism. ***Pharmaceutics***. 2022: 14(11): 2496. https://doi.org/10.3390/pharmaceutics14112496. (**IF= 6.525, *Corresponding author**).

5. Shahid M, Rehman K, **AKASH MSH***, Suhail S, Kamal S, Imran M, Assiri MA. Genetic Polymorphism in Angiotensinogen and Its Association with Cardiometabolic Diseases. ***Metabolites***. 2022; 12(12):1291. https://doi.org/10.3390/metabo12121291. (**IF= 5.581, *Corresponding author**).

Biography

Dr. Akash is currently working as associate professor and chairman at Department of Pharmaceutical Chemistry, Government College University Faisalabad (GCUF), Pakistan. He got his bachelor and master's degrees in pharmacy from Bahauddin Zakariya University Multan, Pakistan and PhD degree in Pharmaceutical Analysis from Zhejiang University, China. Currently, he is focusing on the investigating the effect of environmental contaminants (ECs) on various molecular and metabolic pathways that are involved in metabolic disorders and the treatment strategies of these ECs-induced metabolic disorders funded by Higher Education Commission (HEC) of Pakistan. His Research work is the cutting edge and worthy of extension in developing countries like Pakistan, where it can be most beneficial and cost-effective especially for diabetic patients.

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Photograph

