

The Role of Sociogenomics on Chronic Wounds

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Background and Objective:

Chronic wounds affect almost 2.5% of the United States population. Along with substantial healthcare costs, other factors like reduced employment opportunities and social isolation further complicate the patient's quality of life. Socioeconomic status (SES) has been shown to influence gene expression that can increase susceptibility and deterioration of chronic wounds. Our study looks to identify genes that have been impacted by SES in chronic wound patients. Exploring this association can enhance understanding of the relationship between SES and chronic wound outcomes.

Experimental Design:

A cohort of 72 chronic wound patients were recruited. Patient demographics and socioeconomic backgrounds were collected. Blood DNA isolation was performed and allotted for genetic analysis by Axiom™ Precision Medicine Diversity Array (PMDA). DNA genotyping data was obtained, and single nucleotide polymorphisms (SNP) markers pertaining to wound healing were studied. $P < 0.05$ were used to designate significant SNP marker mutations in the cohort.

Results:

To add strength to our project, we have chosen to further study the results obtained by our group (<https://doi.org/10.18060/27205>), which has previously found significant SNPs associations of the *vitamin D receptor (VDR)* and the *methylenetetrahydrofolate reductase (MTHFR)* genes in chronic wound patients. Using PMDA, our analysis showed polymorphisms in *CYP24A1* ($p = 0.0072$), a gene involved in vitamin D metabolism, and *MTHFR* ($p = 0.00625$), a gene involved in folate and homocysteine metabolism. Modifications of these genes have been associated with pathogenesis to impaired wound healing.

Conclusion:

There is a need for further investigation into health outcomes and their association with SES. Our study aims to address the knowledge gap in this field by focusing on chronic wound healing in relation to socioeconomic status. With our results, we hope to emphasize the importance of sociogenomics, and how it can be utilized to advocate for improved patient outcomes across all socioeconomic backgrounds.

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