

# Causal Relationship Between White Blood Cells Count and Diabetic Nephropathy: A Two-sample Mendelian Randomization Study

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## Abstract

*Background:* Although white blood cells have been linked to several chronic diseases, their direct involvement in diabetic nephropathy (DN) is still uncertain. The objective of this study was to examine the potential causal relationships between different leukocyte subtypes (neutrophils, lymphocytes, monocytes, basophils, and eosinophils) and the risk of developing DN using a two-sample Mendelian randomization (MR) analysis. *Methods:* Using genome-wide association study (GWAS) summary statistics data, a two-sample MR analysis was performed. MR analyses employed the inverse-variance weighted (IVW) method primarily, while also incorporating MR-Egger, weighted median, and weighted mode methods. To assess horizontal pleiotropy, heterogeneity, and potential outliers, sensitivity analyses were performed. *Results:* In total, 426 IVs for neutrophil count, 499 for lymphocyte count, 508 for monocyte count, 201 for basophil count, and 440 for eosinophil count were incorporated. No significant causal associations between leukocyte counts and the risk of DN were revealed by the MR analysis across all methods. Horizontal pleiotropy was not detected by MR-Egger regression, but heterogeneity was noted in certain leukocyte subtypes. While MR-PRESSO detected a few potential outliers, their removal did not affect the overall null results. *Conclusion:* There is no evidence of a causal effect of white blood cells on the risk of DN based on the findings of this two-sample MR study. These findings underscore the need for additional research to validate them and investigate the potential underlying mechanisms.

## Keywords

Diabetic Nephropathy, White Blood Cells Count, Leukocyte, Mendelian Randomization