

Abstract

Genetic Marker for Stroke: NOS3-786 T/C Polymorphism Predicts Risk and Recovery Outcomes[†]

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[†] Presented at the 6th International Congress on Health Innovation—INOVATEC 2025, Hybrid, 21–23 November 2025.

Keywords: stroke; nitric oxide synthase type III; genetic polymorphism

Introduction: Nitric oxide (NO) plays a crucial role in regulating cerebral blood flow and neuronal signaling. Dysfunction of endothelial nitric oxide synthase (NOS3) is linked to cardiovascular diseases, such as atherosclerosis, stroke, and intracranial aneurysms. The NOS3-786 T/C polymorphism (rs2070744) may reduce promoter activity and plasma NO levels, impairing antithrombotic and anti-inflammatory functions. This study evaluated the association between this polymorphism and hemorrhagic stroke (HS) and/or intracranial aneurysm in residents of the Federal District, Brazil, and its correlation with clinical manifestations and prognosis. **Methodology:** Genotyping was performed using PCR-RFLP with Taq enzyme. Data were analyzed using SPSS v.28. **Results:** Among TT genotype carriers, 87.5% of cases had systemic arterial hypertension (SAH), compared to 8.7% of controls, with a 73-fold increased risk of cerebrovascular events ($p < 0.001$; OR = 73.50; 95%CI = 9.24–584.43). TC + CC carriers with SAH had a 20.98-fold increased risk ($p < 0.001$; OR = 20.98; 95%CI = 7.72–57.03). Regarding prognosis, TT carriers showed worse outcomes on the Glasgow Coma Scale, Modified Rankin Scale, and Barthel Index, with significantly higher rates of intermediate coma, severe disability, and poor recovery. **Conclusions:** The NOS3-786 T/C polymorphism, particularly the TT genotype, is associated with increased risk of hemorrhagic stroke and intracranial aneurysm in hypertensive patients and worse clinical outcomes, supporting its relevance as a potential genetic marker.



Academic Editors: Andreanne Vasconcelos, Amílcar Damazo and José Roberto Leite

Published: 5 March 2026

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Author Contributions: Conceptualization, L.C.A.C.-D. and I.C.R.D.S.; methodology, L.C.A.C.-D., F.S.A.B. and R.S.F.; software, D.O.F.; validation, H.C.D.S., L.B.F. and C.M.S.S.; formal analysis, L.C.A.C.-D. and F.S.A.B.; investigation, L.C.A.C.-D., F.S.A.B. and R.S.F.; resources, I.C.R.D.S. and C.M.S.S.; data curation, D.O.F. and H.C.D.S.; writing—original draft preparation, L.C.A.C.-D.; writing—review and editing, L.B.F., C.M.S.S. and I.C.R.D.S.; visualization, F.S.A.B. and R.S.F.; supervision, I.C.R.D.S.; project administration, L.C.A.C.-D.; funding acquisition, I.C.R.D.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by CAPES process n° 00193-00002187/2023-24 and the National Council for Scientific and Technological Development (CNPq) with the Ministry of Health/Department of Science and Technology (MS/Decit), process n° 444755/2023-3.

Institutional Review Board Statement: This case–control study included 81 patients diagnosed with HS and/or intracranial aneurysm and 81 matched controls, approved by the UniCEUB Ethics Committee (Approval No. 0095/2010).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author due to institutional data protection policies.

Conflicts of Interest: The authors declare no conflicts of interest.

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