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CLINICAL AND MOLECULAR CORRELATIONS BETWEEN ENDOTHELIAL DYSFUNCTION AND NOS3 (C-786T) GENE POLYMORPHISM IN PREECLAMPSIA

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The identification of genetic and molecular predictors of preeclampsia is one of the most important challenges in modern obstetrics. Endothelial dysfunction represents a cornerstone in the disease pathogenesis, leading to impaired vascular reactivity, hypertension, and multi-organ hypoperfusion. The NOS3 gene polymorphisms, by modulating nitric oxide bioavailability, may play a crucial role in the severity and progression of preeclampsia. Clarifying these mechanisms can enhance our understanding of vascular homeostasis during pregnancy and open perspectives for personalized preventive strategies**.**

Objective: To evaluate the relationship between NOS3 (C-786T) gene variants and clinical manifestations of endothelial dysfunction in preeclamptic patients**.**

Materials and methods: The study included 110 pregnant women diagnosed with preeclampsia (60 with severe and 50 with mild forms) and 70 healthy pregnant women. Clinical parameters such as blood pressure, proteinuria, and gestational age were recorded. DNA extraction and PCR analysis were carried out using standard molecular protocols. Genotypes were classified as C/C, C/T, or T/T. Statistical analysis was performed to assess the association between genotypes and clinical severity parameters**.**

Results: The heterozygous (C/T) genotype was more prevalent in patients with severe preeclampsia and was associated with higher systolic and diastolic blood pressure, more pronounced proteinuria, and earlier onset of symptoms. The mutant (T/T) genotype, although rare, was detected predominantly in severe cases. These findings suggest that the T allele may influence endothelial function by altering nitric oxide synthesis. Moreover, the presence of the T allele correlated with markers of endothelial injury such as increased vascular resistance and microcirculation impairment**..**

Conclusion: The study confirms the pathogenetic relevance of endothelial dysfunction and highlights the possible contribution of NOS3 gene polymorphisms to the clinical severity of preeclampsia. The detection of such genetic markers in pregnant women may allow for improved risk assessment and earlier preventive interventions. Integration of molecular diagnostics with clinical evaluation may become a key step toward personalized obstetric care.