Abstract

Anxiety disorders are among the most prevalent mental disorders and constitute a major challenge for contemporary public health. Despite extensive research, their etiology remains complex and multifactorial, involving the interaction of biological, psychological, and environmental factors. In recent decades, particular attention has been paid to the role of the serotonergic system in the regulation of emotions and susceptibility to anxiety disorders. However, findings concerning the contribution of individual genetic polymorphisms have been inconsistent.

The aim of this doctoral dissertation was to evaluate phenotypic differences in personality traits and anxiety levels between individuals diagnosed with anxiety disorders and healthy controls, as well as to investigate the potential role of selected polymorphisms of serotonergic system genes (5-HTTLPR in the *SLC6A4* gene, rs6295 in the *HTR1A* gene, and rs6313 in the *HTR2A* gene) in relation to these psychological characteristics.

The study included 322 adults, comprising 159 patients diagnosed with anxiety disorders and 163 healthy control subjects. All participants underwent a clinical interview and completed standardized psychometric assessments, including the NEO Five-Factor Inventory (NEO-FFI) and the State–Trait Anxiety Inventory (STAI). Genomic DNA was isolated from peripheral blood samples. The 5-HTTLPR polymorphism was analyzed using polymerase chain reaction (PCR) followed by agarose gel electrophoresis, whereas the rs6295 and rs6313 polymorphisms were genotyped using real-time PCR. Statistical analyses included comparative tests, assessment of Hardy–Weinberg equilibrium, two-way analysis of variance (ANOVA), and multiple regression models.

The results demonstrated significantly higher levels of neuroticism and both state and trait anxiety, together with significantly lower levels of extraversion, among patients with anxiety disorders compared with healthy controls. No significant main effects of the investigated polymorphisms were observed. However, several significant interactions between genotype and group membership were identified. The findings indicate that the principal differences between individuals with anxiety disorders and healthy controls are reflected primarily at the level of psychological phenotypes rather than individual genetic variants.

The obtained results support a dimensional approach to anxiety disorders and emphasize the importance of personality traits and anxiety dimensions as intermediate phenotypes of emotional regulation. The absence of significant main effects of the analyzed polymorphisms does not undermine the role of the serotonergic system in the pathophysiology of anxiety. Instead, it highlights the polygenic and context-dependent nature of susceptibility to anxiety disorders and underscores the need for more comprehensive research models integrating genetic, environmental, and psychosocial factors.