

Influences of neurotransmission-related genetic polymorphisms on depression, anxiety and stress

ABSTRACT

Over 10% of the world population suffer from mental disorders. In particular, depression causes about 800,000 suicide cases annually, while anxiety is the most common mental disorder. Stresses from work, life, and health have been identified as the common triggers for the two mental disorders. Eventhough mental disorders are treatable and validated tools are available to diagnose, many individuals are left untreated due to different factors, such as a lack of trained personnel and stigma. Neuroscience research indicates that mental disorders could be hereditary, where genes involved in determining behavioural variants. Disturbance in brain communication, resulting from abnormalities in neurogenesis, neurotransmission, and enzymatic degradation, have led to negative emotional states. This mini-review will highlight some important genes in the neurotransmitter systems and explore the relationship between gene polymorphisms and emotional states (i.e., depression, anxiety, and stress). The genes that will be discussed in this mini-review include brain-derived neurotrophic factor (BDNF) which is involved in neuron development, serotonin-transporter-linked polymorphic region (5-HTTLPR) and 5- hydroxytryptamine receptor 1A (5-HT1A) which are involved in serotonin neurotransmitter action potential propagation, and monoamine oxidase A (MAOA) and catechol-O-methyltransferase (COMT), which are involved in neurotransmitter catabolism.