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Cognition and affective temperament in obesity: The neuropsychological and genetics data

Alina Borkowska

Nicolaus Copernicus University, Poland

Background: Obesity is a serious health problem, especially in countries with high economic development associated with neuropsychiatric disturbances. The results of current studies indicate that psychological factors, affective disorders and cognitive dysfunctions may play an important role in etiopathogenesis and in the course of this disease. We explore the relationships between obesity, depression, and five dimensions of affective temperament, cognitive functions and polymorphism of genes connected with emotional and cognitive processes.

Subjects: 520 obese patients (BMI>35), aged 18-56 (mean 42.3±12) years were included in the study. The results of patients with obesity were compared with the results obtained by 200 healthy controls (BMI<25), sex, age and education matched to the investigated group.

Methods: The intensity of depressed symptoms was assessed by Beck Depression Inventory and Hamilton Depression Scale. For evaluation of five dimensions of affective temperament (depressive, cyclothymic, hyperthymic, irritable and anxious) the Polish version of TEMPS-A Akiskal scale were used. Cognitive functions connected with activity of prefrontal cortex were evaluated by Wisconsin Card Sorting Test. The polymorphism of genes connected with serotonin and dopamine system and BDNF gene were evaluated using PCR method. All subjects were also checked by Food Addiction Scale.

Results: Obese patients presented higher prevalence of depression (up to 50% of the whole group presents severe intensity of depression), worse performance of cognitive tests (especially WCST and TMT B) and higher score in Food Addiction Scale compared to healthy controls. Patients with obesity present higher prevalence of depressive, cyclothymic and anxious temperament than healthy subjects. Female scores higher in depression and anxiousness while males on irritable and hyperthymic temperament. The intensity of depression was correlated with depressive temperament especially in females. The higher scores of Food Addition Scale show positive correlation with hyperthymic and cyclothymic temperament. The higher score of depressive temperament in TEMPS-A scale was associated with the s/s allele of 5-HTT polymorphism gene. The val/val allele of Val/Met polymorphism of BDNF gene was associated with higher score of depressive and anxious temperament, while met/met allele of this gene was connected with higher score of hyperthymic temperament in TEMPS-A scale. The results of all parameters of WCST were connected with the polymorphism of COMT gene. The G/G allele of 5-HTT gene was associated with worse results on two dimensions on WCST (non-persistent errors and numbers of cards needed to complete 1st category).

Conclusions: Obese patients present higher prevalence of depression, difficulties in prefrontal cognitive functions and different pattern of affective temperament compared to healthy control subjects. The polymorphism of serotonin transporter 5-HTT and BDNF genes were associated with depression and affective temperament, while dopaminergic COMT gene to the cognitive abilities. This may indicate different influence of serotonin, dopamine and neurodevelopmental system genes on emotional and cognitive functions in patients with obesity.

Biography

Alina Borkowska is Head of Clinical Neuropsychology Department in Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University in Torun and Head of Clinical Psychology Department of Medical University in Lodz, Poland. Her research concerns on neurobiology and genetics of cognitive dysfunctions in psychiatric diseases, especially schizophrenia, bipolar disorder, OCD, MCI, dementia and pathological obesity. She is the Head of numerous university and national Polish grants in this area and participates in international programs concerning genetics, neurobiology and treatment of cognitive dysfunctions in psychiatric diseases. She was awarded with national and international scientific awards. She is a member of Polish Psychiatric Association, European Psychiatrist Association and member of scientific board in numerous scientific journals and Polish Committee of Science. She is invited speaker on international conferences and author of numerous publications in international journals.

alab@cm.umk.pl