Aleksandra Chyrek-Tomaszewska

Clinical, molecular and genetic correlates of neuropsychological and temperamental aspects in the population of patients with chronic lower limb ischemia

ABSTRACT OF THE DOCTORAL DISSERTATION

Chronic lower limb ischemia is one of the most common manifestation of atherosclerosis. Its treatment is based on a lifestyle modification in secondary prevention and regular walking training. Some patients require invasive treatment, which includes: percutaneous endovascular procedures and surgery. Mainly, the disease is associated with pain, but it is also a psychological burden. The importance of psychological factors such as anxiety, depression and affective temperament in cardiovascular diseases is increasingly emphasized. In the case of chronic lower limb ischemia, this matter has not been exhausted. BDNF and the BDNF gene polymorphism Val66Met are also linked to neuropsychology. They may also have a potential impact on the course of the disease. BDNF is a protein that regulates the functioning of the nervous system. Its reduced peripheral concentration has been described in numerous neuropsychiatric diseases. Furthermore, the role of BDNF and its Val66Met gene polymorphism has been increasingly recognized in cardiovascular diseases.

The aim of the study was to analyze the genetic and molecular correlates of neuropsychological and temperamental factors in patients with peripheral artery disease.

The analysis included 159 patients (52 women and 107 men) with the age range 59-73 years. All of them suffered from symptomatic chronic lower limb ischemia and were qualified for an invasive treatment (endovascular procedures -124 patients, surgery-35 patients).The study was conducted in the Department of Vascular and Internal Diseases of Jan Biziel's University Hospital No. 2 in Bydgoszcz. Subjects, after giving their informed consent to participate in the study, were clinically and neuropsychologically assessed. Their blood was collected for genetic and molecular tests. The neuropsychological examination included the assessment of affective temperament (using the Polish adaptation of the

TEMPS-A questionnaire) and the severity of depressive and anxiety symptoms (using the HADS scale). Laboratory tests included BDNF concentration in serum and the BDNF Val66Met genetic polymorphism. The data obtained in the study were analyzed using the Statistica 13 program.

The findings revealed that serum BDNF concentrations were lower in patients with chronic lower limb ischemia. The concentrations were particularly low in patients with the coexisting heart failure. In that context, no significant correlations were found for the BDNF Val66Met gene polymorphism. Furthermore, an increased severity of depressive and anxiety symptoms was observed. Especially high levels of depressive symptoms were observed in 40 patients required surgical treatment. Moreover, there was a negative correlation between the severity of depression and anxiety, and the ABI measured on the treated limb. There was also a positive correlation with the intensity of pain and amputations. Additionally, more severe depressive symptoms were associated with the number of past vascular procedures. Affective temperament traits such as tendency to be depressive or anxious were more often. Hyperthymic and irritable temperaments, on the other hand, were less intense. The cognitive functioning of the subjects differed depending on gender. Women performed better in memory tests, and men showed faster reaction times and better answers in the GoNoGo test. Additionally, it was observed that cognitive functions may be influenced by the BDNF Val66Met polymorphism, but in a sex-specific manner.

To sum up, the psychological, genetic and molecular factors influence the course of chronic lower limb ischemia. Awareness of such relationships may improve patient care and influence on prognosis.