9. Streszczenie w języku angielskim

Introduction

The COVID-19 pandemic has contributed to a significant increase in the incidence of mental disorders, including depressive and anxiety disorders. Previous scientific research indicates that a history of SARS-CoV-2 infection may trigger or exacerbate symptoms of depressive disorders. COVID-19 infection can lead to immune system dysfunction and prolonged inflammation lasting even several months post-infection, which may contribute to difficulties in treating depressive disorders. The literature review indicates that patients with elevated baseline inflammation show a weaker response to conventional antidepressant therapies and that coexisting immunological underpinnings of inflammatory diseases are a risk factor for a depressive episode, treatment resistance, and recurrence of depression. Antidepressant treatment has several beneficial effects, such as alleviating depressive symptom severity, improving cognitive functions and reducing inflammation by lowering levels of pro-inflammatory cytokines and oxidative-nitrosative stress. It has been observed that some antidepressants may alleviate depressive symptoms in patients with COVID-19. Given the increasing frequency of depressive disorders and the specificity of their treatment in the post-pandemic COVID-19 period, further research is necessary to develop new therapeutic strategies.

Aim of the study

The doctoral dissertation aimed to evaluate the impact of previous SARS-CoV-2 infection on the effectiveness of antidepressant treatment with an assessment of neurocognitive functions and an analysis of selected inflammatory parameters in individuals with depression.

Material and Methods

A total of 33 hospitalised patients diagnosed with depressive disorders and 30 healthy individuals without mental disorders were examined. In the study group, contact with the SARS-CoV-2 virus was confirmed in 21 individuals, while in the control group, it was confirmed in 23 study participants. At the beginning of the study, all participants underwent a physical and psychiatric examination, an assessment of neurocognitive

functions, and biological material was collected for analysis (first measurement). The second test procedure (second measurement) was performed 4-6 weeks after initiating antidepressant treatment in 21 individuals, including 15 persons with a confirmed history of SARS-CoV-2. Response to antidepressants was measured as an improvement in scores on the HAM-D, BDI, and HAM-A scales before and after treatment. Basic biochemical parameters of blood were examined in all participants, and parameters of the kynurenine pathway and oxidative and nitrosative stress were determined in serum and urine samples: kynurenine (KN), N-formylkynurenine (NFK), dityrosine (DT), tryptophan (TRY), superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx), reduced glutathione (GSH), 4-hydroxynonenal (4-HNE), nitric oxide (NO), S-nitrosothiols and peroxynitrites.

Results

A significant decrease in serum peroxynitrite concentration and a significant increase in serum GSH concentration were observed in depressed individuals after antidepressant treatment. In patients with depression and a history of COVID-19, significantly lower serum GPx activity and significantly higher urinary NO concentration were observed in the first measurement, and significantly higher serum S-nitrosothiol concentrations were found in the second measurement. In patients with depression before treatment, positive correlations of HAM-D scale results with serum CAT activity and urinary S-nitrosothiol concentration were observed, as well as positive correlations of BDI results with serum GSH concentration and SOD activity. No significant correlation was observed in oxidative stress parameters from the first measurement with changes in HAM-D, HAM-A and BDI scale results before and after antidepressant treatment. No significant differences were observed in CRP and D-dimer concentrations in people with depression compared to the control group, nor was there an effect of antidepressant treatment on CRP and D-dimer concentrations. No impact of COVID-19 on changes in CRP and D-dimer concentrations was observed. A positive correlation between CRP values and a reduction in the severity of depression according to the BDI scale after antidepressant treatment was demonstrated. After treatment, a significant decrease in the severity of depression and anxiety was observed using the HAM-D, BDI, and HAM-A scales, as well as an increase in the scores for individual CVLT tasks assessing memory processes. No significant differences were observed in the IES-R scores between patients with

depression before treatment and the control group, as well as to the history of COVID-19. In the study group, before and after antidepressant treatment, no significant correlations were found between the concentrations of SARS-CoV-2 antibodies and the severity of depression and anxiety, the change in the results of the HAM-D, HAM-A, BDI scales and the severity of general symptoms during SARS-CoV-2 infection. In the control group, a significant correlation was observed between the concentrations of anti-N IgG antibodies and the severity of taste disorders during SARS-CoV-2 infection.

Conclusions

1. Although reports from the literature review suggest that inflammatory processes occurring in SARS-CoV-2 infection may affect the effectiveness of treatment in people with depression, this study does not confirm that the clinical response to antidepressant therapy may be associated with having had COVID-19 and the initial concentration of SARS-CoV-2 antibodies.
2. The level of perceived stress related to the COVID-19 pandemic did not differ between people with depression and those without depression, depending on whether they had COVID-19.
3. Having had COVID-19 among people with depression is associated with increased oxidative stress compared to the control group (lower GPx activity and higher NO concentration).
4. Antidepressant treatment affects the parameters of oxidative and nitrosative stress (increased GSH concentration, decreased peroxynitrite concentration).
5. Antidepressant treatment reduces the symptoms of depression and improves cognitive functions.
6. Depression severity correlates with oxidative and nitrosative stress parameters (CAT and SOD activity, GSH concentration, S-nitrosothiol concentration).
7. Further studies are necessary to assess the impact of COVID-19 on the effectiveness of antidepressant therapy. Their results may deepen the knowledge and awareness among clinicians, support the search for new methods to optimise the treatment of depressive disorders in the post-pandemic period, and enable better identification of patients from high-risk groups, including those with post-COVID-19 syndrome

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