Cerebrovascular disease

Group of brain dysfunctions related to disease of the blood vessels supplying the brain.

Cardiovascular and cerebrovascular diseases have become the leading cause of death for people, and Neuroendovascular treatment has become the main therapeutic method.

Since the appearance of the first case of coronavirus disease 2019 (COVID-19) a pandemic has emerged affecting millions of people worldwide. Although the main clinical manifestations are respiratory, an increase in neurological conditions, specifically acute cerebrovascular disease, has been detected [1].

Pathogenesis

The microbiota-gut-brain axis is an essential regulatory mechanism between gut microbes and their host. Therefore, the compositional and functional gut microbiota alterations lead to cerebrovascular disease pathogenesis. The current study aims to determine the alteration and clinical value of the gut microbiota in CSVD patients.

Methods: Sixty-four CSVD patients and 18 matched healthy controls (HCs) were included in our study. All the participants underwent neuropsychological tests, and the multi-modal magnetic resonance imaging depicted the changes in brain structure and function. Plasma samples were collected, and the fecal samples were analyzed with 16S rRNA gene sequencing.

Results: Based on the alpha diversity analysis, the CSVD group had significantly decreased Shannon and enhanced Simpson compared to the HC group. At the genus level, there was a significant increase in the relative abundances of Parasutterella, Anaeroglobus, Megasphaera, Akkermansia, Collinsella, and Veillonella in the CSVD group. Moreover, these genera with significant differences in CSVD patients revealed significant correlations with cognitive assessments, plasma levels of the blood-brain barrier-/inflammation-related indexes, and structural/functional magnetic resonance imaging changes. Functional prediction demonstrated that lipoic acid metabolism was significantly higher in CSVD patients than HCs. Additionally, a composite biomarker depending on six gut microbiota at the genus level displayed an area under the curve of 0.834 to distinguish CSVD patients from HCs using the least absolute shrinkage and selection operator (LASSO) algorithm.

Conclusion: The evident changes in gut microbiota composition in CSVD patients were correlated with clinical features and pathological changes of CSVD. Combining these gut microbiota using the LASSO algorithm helped identify CSVD accurately [2]

Risk factors

Cerebrovascular disease risk factors.

Pathophysiology

Cystathionine β-synthase (CBS) is involved in homocysteine and hydrogen sulfide (H2S) metabolism. Both products have been implicated in the pathophysiology of cerebrovascular diseases.

Classification

Cerebrovascular disease classification.

Clinical features

Cerebrovascular disease (CVD) is the most prevalent neurological disorder today, but it has generally been considered a rare cause of auditory dysfunction. However, a substantial proportion of patients with stroke might have auditory dysfunction that has been underestimated due to difficulties with evaluation.

The numbers of patients with CVD accompanied by auditory dysfunction will increase as the population ages. Cerebrovascular diseases often include the auditory system, resulting in various types of auditory dysfunctions, such as unilateral or bilateral deafness, cortical deafness, pure word deafness, auditory agnosia, and auditory hallucinations, some of which are subtle and can only be detected by precise psychoacoustic and electrophysiological testing. The contribution of CVD to auditory dysfunction needs to be understood because CVD can be fatal if overlooked [3].

Cerebrovascular disease treatment

Cerebrovascular disease treatment.

1)
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