Dysfunction of Circulating Endothelial Progenitor Cells in Patients With Major Depressive Disorder

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Background

The bidirectional association of major depressive disorder (MDD) with cardiovascular disorders may be attributed to endothelial dysfunction (ED), which can activate circulating endothelial progenitor cells (cEPCs). Although cEPC quantity is associated with depression, no study has investigated cEPC functions in MDD.

Aims & Objectives

We investigated the associations of cEPC adhesion and apoptotic properties with MDD. We recruited 50 patients with MDD and 28 healthy controls (HCs). The depression symptoms, anxiety, psychosomatic symptoms, subjective cognitive dysfunction, quality of life, and functional disability of patients with MDD were evaluated using the Hamilton Depression Rating Scale and Montgomery–Å sberg Depression Rating Scale, Hamilton Anxiety Rating Scale, Depression and Somatic Symptoms Scale (DSSS), Perceived Deficits Questionnaire-Depression, 12-Item Short Form Health Survey (SF-12), and Sheehan Disability Scale (SDS), respectively. Cognitive function was assessed using a 2-back task, and cEPC adhesion to fibronectin and the percentage of apoptosis were measured using relevant in vitro assays.
Methods

Results

Relative to HCs, patients with MDD had significantly lower cEPC adhesion to fibronectin (P = 0.004). The level of cEPC adhesion for MDD patient discrimination from HCs was acceptable (area under the curve = 0.742). The number of cEPC adhesions was inversely correlated with the omission errors in the 2-back task and with DSSS and SDS scores but was positively correlated with the mental component summary in the SF-12. The percentage of cEPC apoptosis did not differ significantly between the groups.

Discussion & Conclusion

Our study demonstrated that relative to HCs, patients with MDD exhibited reduced cEPC adhesion. The reduced cEPC adhesion was also correlated with impaired sustained attention and working memory, severe psychosomatic symptoms, poor mental quality of life, and severe psychosocial disability. Our results indicate that cEPC adhesion dysfunction is associated with MDD and its related attention deficit and psychological outcomes. These findings are preliminary and must be replicated in further studies.