

Abstract

Mol Psychiatry. 2011 Jan 18. [Epub ahead of print]

Resting leukocyte telomerase activity is elevated in major depression and predicts treatment response.

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BACKGROUND: Telomeres are DNA-protein complexes that cap linear DNA strands, protecting DNA from damage. When telomeres critically shorten, cells become susceptible to senescence and apoptosis. Telomerase, a cellular ribonucleoprotein enzyme, rebuilds the length of telomeres and promotes cellular viability.

OBJECTIVE: Leukocyte telomeres are reportedly shortened in major depression, but telomerase activity in depression has not been previously reported. Further, there are no published reports of the effects of antidepressants on telomerase activity or on the relationship between telomerase activity and antidepressant response.

METHODS: Peripheral blood mononuclear cell (PBMC) telomerase activity was assessed in 20 medication-free depressed individuals and 18 controls. In total, 16 of the depressed individuals were then treated with sertraline in an open-label manner for 8 weeks, and PBMC telomerase activity was reassessed in 15 of these individuals after treatment. Pre- and post-treatment symptom severity was rated with the Hamilton Depression Rating Scale. All analyses were corrected for age and sex.

RESULTS: Pre-treatment telomerase activity was significantly elevated in the depressed individuals compared with the controls ($P=0.007$) and was directly correlated with depression ratings ($P<0.05$) across all subjects. In the depressed group, individuals with relatively lower pre-treatment telomerase activity and with relatively greater increase in telomerase activity during treatment, showed superior antidepressant responses ($P<0.05$ and $P<0.005$, respectively).

CONCLUSIONS: This is the first report characterizing telomerase activity in depressed individuals. PBMC telomerase activity might reflect a novel aspect of depressive pathophysiology and might represent a novel biomarker of antidepressant responsiveness.

PMID: 21242992