Evaluating the Neurophysiological Effects of Late-Life Depression using Transcranial Magnetic Stimulation

Apoorva Bhandari

Master of Science

Institute of Medical Science
University of Toronto

2016

**Background:** Depression is one of the most common neuropsychiatric disorders in adults aged 60 and over. Young depressed adults demonstrate dysfunctional GABAergic neurotransmission and impaired neuroplasticity. However, an understanding of the neurophysiological mechanisms underlying late-life depression (LLD) is lacking.

**Methods:** This study aimed to evaluate transcranial magnetic stimulation (TMS) measures of cortical inhibition, excitation, and neuroplasticity in 67 LLD patients and 39 healthy non-psychiatric controls aged 60 and over.

**Results:** No differences were found for cortical inhibition or excitation between depressed patients and controls. LLD patients demonstrated impaired neuroplasticity induction compared to a baseline value of 1mV; however, when compared to controls depressed patients showed no significant plasticity deficits.

**Conclusions:** Our findings provide indirect support for the age-by-disease hypothesis for LLD, which posits that with age the brain advances into a physiological state that promotes susceptibility to LLD. Further research is required to understand the pathophysiology of LLD.