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Mood, Cognition, & Motor Effects of Hormone Replacement Therapy In Women with Parkinson’s Disease

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Parkinson’s disease (PD) is a neurodegenerative disease of central nervous system dopamine depletion that has a greater prevalence in men. Estrogen is thought to be neuroprotective and as such, may attenuate the debilitating motor, cognitive, and mood symptoms associated with PD in women. Existing literature shows positive effects of hormone replacement therapy (HRT) on motor symptoms in PD, but the effects of HRT on mood and other non-motor symptoms in PD women are inconclusive. While estrogen use has demonstrated a serotonin-modulated anti-depressant effect in non-PD women, it is hypothesized that dopamine may predominantly modulate depression in PD, yet the effects on other mood and cognitive symptoms are unknown. Therefore, the objective of this study was to evaluate differences in mood and cognitive symptoms in women with PD on or off HRT (PD HRT+/PD HRT- respectively).

Twenty-six PD HRT+ and seventeen PD HRT- participants completed a questionnaire characterizing hormone replacement therapy use. Participants completed self-report measures of mood (i.e., depression, anxiety and apathy) as well as cognitive and motor evaluations. Statistical analyses included independent t-tests, Mann-Whitney U tests, and linear regressions.

Results revealed PD HRT+ women were significantly more depressed ($p=0.023$), but exhibited similar levels of anxiety ($p=0.75$) and apathy ($p=0.69$) compared to PD HRT- women while controlling for age. Furthermore, PD HRT+ women exhibited poorer (trend) attention ($p=0.055$), and better (trend) motor skills ($p=0.079$) while controlling for age and depression.

While there was a trend improvement in motor function with HRT, overall, this study did not confirm a neuroprotective effect of HRT on mood, cognitive, or motor symptoms in PD. In contrast, HRT appears to have a negative effect on depression and possibly on cognition/attention. Our results may reflect a difference in how estrogen interacts with reduction of dopamine in PD; future work to explore this possibility is warranted. Though the lower PD prevalence in females suggests a protective effect of endogenous estrogen prior to developing PD, it may be that exogenous estrogen use in PD women can only offer additional protection limited to motor function, while at the expense of deleterious mood and cognitive effects.

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