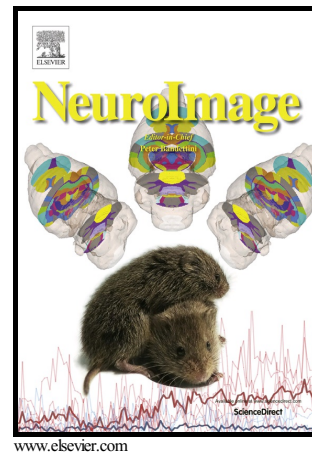


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Effects of sex hormone treatment on white matter microstructure in individuals with gender dysphoria

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ABSTRACT

Sex steroid hormones such as estradiol and testosterone are known to have organizing, as well as activating effects on neural tissue in animals and humans. This study investigated the effects of transgender hormone replacement therapy on white matter microstructure using diffusion tensor imaging. Female-to-male and male-to-female transgender participants were measured at baseline, four weeks and four months past treatment start and compared to female and male controls. We observed androgenization-related reductions in mean diffusivity and increases in fractional anisotropy. We also observed feminization-related increases in mean diffusivity and reductions in fractional anisotropy. In both transgender participants and controls, hormonal fluctuations were correlated with changes in white matter microstructure. Although the present study does not preclude regression to the mean as a potential contributing factor, the results indicate that sex hormones are – at least in part – responsible for white matter variability in the human brain. Studies investigating the effects of sex hormones on adult human brain structure may be an important route for greater understanding of the psychological differences between females and males.

Keywords:

gender dysphoria, transgender, diffusion tensor imaging, hormone replacement therapy

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