

Hormone therapy helps strengthen brain connections in transgender women

by The Endocrine Society

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In transgender women who have had their testes removed as part of the gender-affirming process, a form of estrogen called estradiol strengthens connections between areas of the brain involved in fine motor skills, learning, emotions and sensory perception, according to a study to be presented Monday at ENDO 2019, the Endocrine Society's annual meeting in New Orleans, La. These findings reflect changes on the brain that might have implications, for instance, for treating hot flashes and other symptoms in transgender women, the researchers say.

"Once [transgender women](#) have their testes removed, their bodies have no sex hormones unless they take exogenous sex hormones (e.g., estradiol) as replacement therapy," said researcher Tayane Muniz Figuera, Ph.D., of the Hospital de Clínicas de Porto Alegre in Porto Alegre, Brazil. Without any sex hormones, transgender [women](#) have the same symptoms, such as hot flashes, that [postmenopausal women](#) have, she said.

"The disconnection between parts of the brain involved in sensory motor processing and the thalamus may be one of the causes of these symptoms," she said. Figuera noted this is the first study to show the effect of estrogens in the connectivity of this area of the brain in transgender women who have had their testes removed, called a gonadectomy.

"Some trans women take estradiol before surgery, but stop taking it afterwards," she said. "Our study suggests they should continue taking estradiol not only to feminize their bodies or to avoid the symptoms related to the absence of sex hormones, but also to prevent the weakening of brain connectivity between brain regions of clinical relevance."

"This finding is a great advance for the neuroendocrinology sciences," said lead researcher Maiko Abel Schneider, Ph.D., of McMaster University in Hamilton, Ontario, Canada.

The study included 18 transgender women who had their testes removed when they completed surgical transition. They were invited to discontinue sex hormone therapy and then go back to taking estradiol. They underwent MRI testing 30 days after they stopped taking hormones, and again 60 days after they started taking estradiol again to compare the on/off effects of estradiol.

"We found taking estradiol strengthened the thalamus' role as a 'relay station' for sensory and motor information in the brain," they explained. Almost all [sensory information](#) that goes to the brain's cortex first stops in the thalamus before being sent on to its destination. The thalamus is subdivided into areas that have functional specializations for dealing with particular types of information.

"Although this is a small pilot study, it suggests that [sex hormones](#) are important to keep the brain connectivity in transgender women," Figuera said.