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Evidence suggests that treatments used to feminize transgender women result in altered brain structures.

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One study showed that estradiol valerate and cyproterone acetate, treatments used to feminize adult male rats mirroring those in transgender women, resulted in altered brain structure, including reduced volume and elevated specific metabolites.

In a 2020 study [1], Gómez et al. used a rat model to investigate the effects of feminizing hormonal treatments, specifically estradiol valerate and cyproterone acetate, akin to those given to transgender women. They monitored changes over 30 days using structural MRI and Diffusion Tensor Imaging. The researchers found that these treatments led to a generalized bilateral decrease in cortical volume. Additionally, they noted increases in the relative concentration of brain metabolites, including glutamate and glutamine. The study concludes that these hormonal treatments induce significant changes in brain structure and metabolite concentration.

## REFERENCES

[1] Gómez, Á., Cerdán, S., Pérez-Laso, C., Ortega, E., Pásaro, E., Fernández, R., ... & Guillaumon, A. (2020). Effects of adult male rat feminization treatments on brain morphology and metabolomic profile. *Hormones and behavior*, 125, 104839. [\[Link\]](#)

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