

AGE RELATED CORTICAL GRAY MATTER LOSS IN MEN AND WOMEN

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Background: The difference in brain volume between the genders has always been a crucial question of interest. Recent improvements in imaging techniques allow the comparison of brain structures *in vivo*. A number of studies have indicated that aging is associated with decrease in the whole-brain volume, the grey matter volume, the white matter volume and the cortical thickness. A greater decline in grey matter volume with advancing age in males has also been reported in some, but not in all studies.

Methods: High-resolution T1-weighted images were acquired (1.5 T GE Signa Excite MRI scanner) from 53 healthy males and 50 age-matched healthy females. Intensity-based segmentation (FSL-SIENAX) and voxel-based morphometry (FSL-VBM) was conducted to reveal the gender difference and age dependence in the partial brain volumes and cortical thickness.

Results: Our analysis revealed that males have a larger brain, but when correction is made for the total intracranial volume, this difference disappears. In fact, females have relatively more cortical (orbitofrontal region and the cerebellum) and subcortical grey matter compared to males. Within the age-range 21 to 58 years atrophy of the cortex was detected in widespread areas in both groups in the course of aging, which proved to be somewhat faster in males, especially in the vermis of the cerebellum.

Conclusion: These results draw attention to the importance of gender and age factors when the findings of cross-sectional structural MRI studies are assessed. Our results additionally demonstrate the sensitivity of the intensity-based segmentation and the voxel-based morphometric approaches.