

# Sex differences of vascular brain lesions in patients with atrial fibrillation

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**Background:** Female patients in the general population and patients with atrial fibrillation (AF) are at higher overall risk for clinically overt and silent brain lesions.

**Objectives:** This study aims to assess sex differences in vascular brain lesions by brain magnetic resonance imaging (MRI) in patients with atrial fibrillation.

**Methods:** We included 1'743 patients (27% female) with known AF in the multicenter SWISS-AF study in Switzerland with available brain MRI at inclusion. In this cross sectional analysis, we compared vascular brain lesions, including large noncortical or cortical infarcts (LNCCIs) and small noncortical infarcts (SNCI), as well as microbleeds (MB) and white matter lesions (WML) between male and female patients. WML were graded using the Fazekas score  $\geq 2$  for moderate or severe white matter disease. Voxel-based lesion mapping was done in 1'716 patients and compared within vascular territories.

**Results:** Mean age was  $73 \pm 8$  years in men,  $74 \pm 8$  years in women. On MRI, 20% women and 24% men had LNCCIs. SNCI were found in 21% women and 23% in men. MB were found in 21% women and 23% men and WML with Fazekas  $\geq 2$  in 59% females and 52% males. Using uni- and multivariable regression analysis there was no association of female sex with the prevalence and volume of LNCCI, SNCI, total ischemic lesions and MB. In a multivariable regression model, female sex was the strongest predictor of total WML volume ( $\beta = 0.17$ , 95% CI 0.04 – 0.31;  $p=0.01$ ). Voxel-based mapping showed a right hemisphere dominance of ischemic lesions in both men and women, while WML were equally distributed. Relevant sex differences within the vascular territories have not been observed.

**Conclusion:** We did not find relevant sex differences in the prevalence, volume and distribution of ischemic lesions. Women had a greater median volume of total WML and tended to have higher prevalence of Fazekas  $\geq 2$ , but there was no association regarding a difference in the hemispheric distribution.