



## Medial temporal lobe atrophy and posterior atrophy scales normative values

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### Abstract:

**Objectives:** The medial temporal lobe atrophy (MTA) and the posterior atrophy (PA) scales allow to assess the degree hippocampal and parietal atrophy from magnetic resonance imaging (MRI) scans. Despite reliable, easy and widespread employment, appropriate normative values are still missing. We aim to provide norms for the Italian population.

**Methods:** Two independent raters assigned the highest MTA and PA score between hemispheres, based on 3D T1-weighted MRI of 936 Italian Brain Normative Archive subjects (age: mean  $\pm$  SD: 50.2  $\pm$  14.7, range: 20–84; MMSE > 26 or CDR = 0). The inter-rater agreement was assessed with the absolute intraclass correlation coefficient (aiCC). We assessed the association between MTA and PA scores and sociodemographic features and APOE status, and normative data were established by age decade based on percentile distributions.

**Results:** Raters agreed in 90% of cases for MTA (aiCC = 0.86; 95% CI = 0.69–0.98) and in 86% for PA (aiCC = 0.82; 95% CI = 0.58–0.98). For both rating scales, score distribution was skewed, with MTA = 0 in 38% of the population and PA = 0 in 52%, while a score  $\geq$  2 was only observed in 12% for MTA and in 10% for PA. Median denoted overall hippocampal (MTA: median = 1, IQR = 0–1) and parietal (PA: median = 0, IQR = 0–1) integrity. The 90th percentile of the age-specific distributions increased from 1 (at age 20–59) for both scales, to 2 for PA over age 60, and up to 4 for MTA over age 80. Gender, education and APOE status did not significantly affect the percentile distributions in the whole sample, nor in the subset over age 60.

**Conclusions:** Our normative data for the MTA and PA scales are consistent with previous studies and overcome their main limitations (in particular uneven representation of ages and missing percentile distributions), defining the age-specific norms to be considered for proper brain atrophy assessment.

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