

Subcortical nuclei changes in Alzheimer's disease: Results from LATAM.

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INTRODUCTION

Subcortical structures are commonly neglected in ADD.

Changes in the early stages of sporadic ADD are evident in several thalamic nuclei (Bernstein et al., 2021; Forno et al., 2023).

Novel segmentation pipeline (sTHOMAS) (Saranathan et al., 2025).

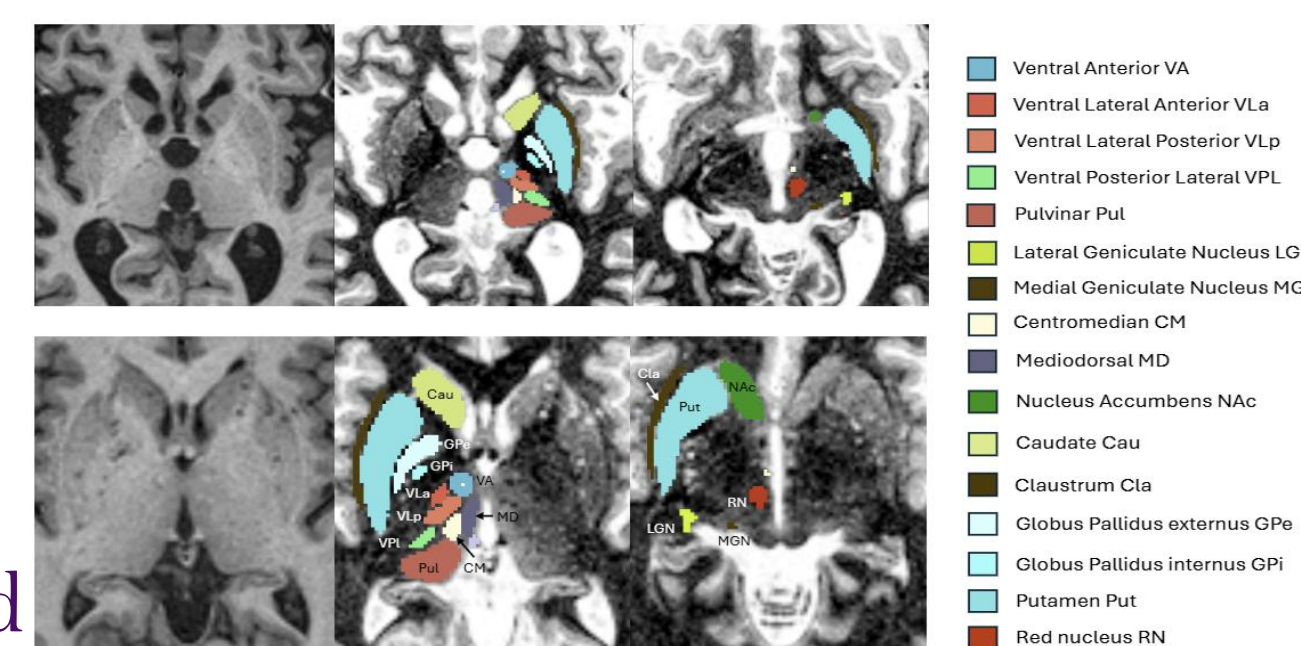
Evidence relies on High-income countries (HIC), with no similar studies from LATAM.

METHODS

Data from 1363 (HC) and 776 AD participants from the Gero (Slachevsky et al., 2020) and RedLat cohorts (Ibañez et al., 2021) were analyzed using a novel segmentation technique (Banerjee et al., 2025).

METHODS

12 thalamic nuclei volumes were calculated, and adjusted by total intracranial volume (eTIV) and age using the residual method (Pintzka et al., 2015).



$$Vol_{adj} = Vol - b * (TIV - \overline{TIV}).$$

Adjusted TIV and age thalamic volumes were compared using the Mann-Whitney U test, and effect size was calculated using the Delta Mu ($\Delta\mu$) method. Scanner was used as a covariate.

RESULTS

	HC	ADD	P-val
Age	65.120 (11.850)	70.367 (8.237)	$p < 0.001$
Education	13.2 (5.55)	12.2 (5.24)	$p < 0.001$
Sex (F:M)	979:387	503:279	$p < 0.001$
MMSE	27.73 (2.76)	20.41 (5.3)	$p < 0.001$

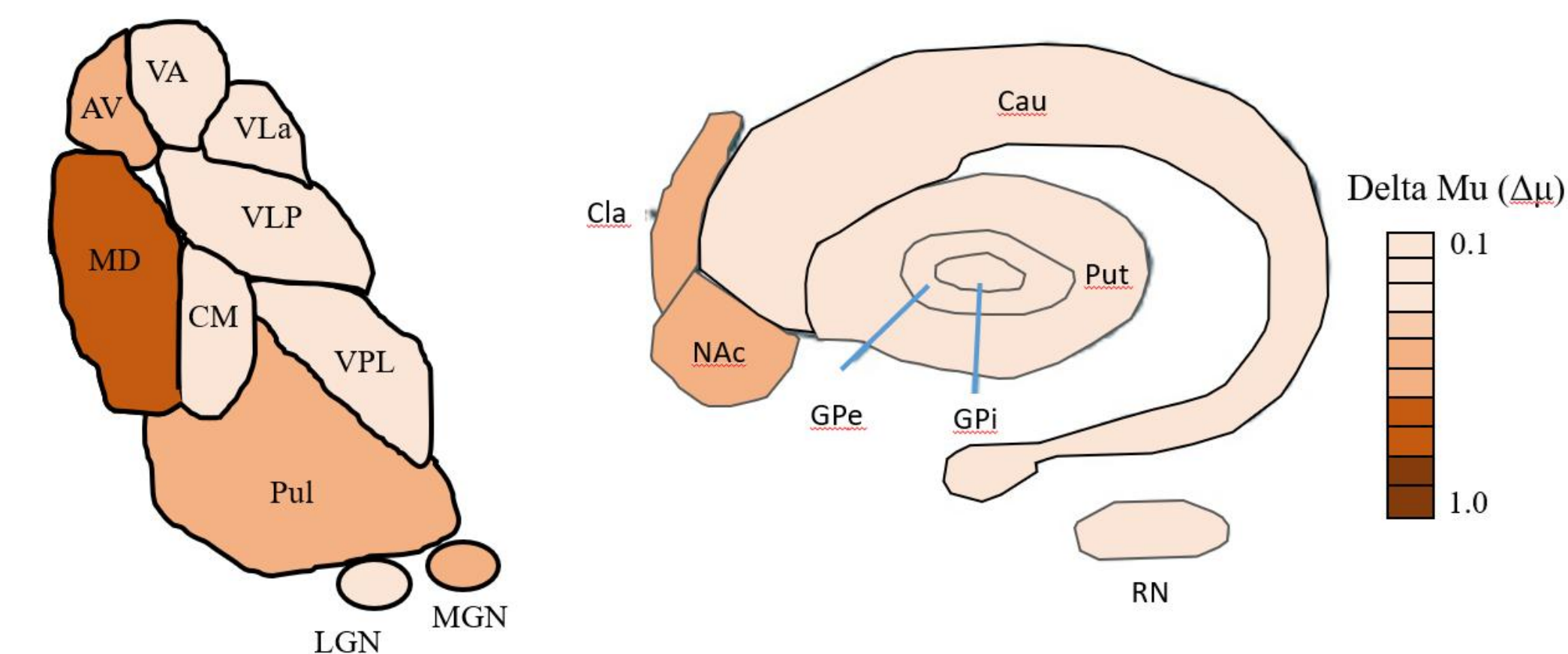
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RESULTS

Significant volume reduction in several thalamic nuclei and deep grey matter volumes was found in ADD compared to HC.

Larger effects were found in the mediodorsal (MD) and pulvinar nucleus, as well as the nucleus accumbens, and claustrum.



Note. Darker color represents a stronger effect size.

CONCLUSIONS

Preliminary results from LATAM align with previous HIC studies showing significant subcortical changes in ADD compared to HC (Bernstein et al., 2021; Banerjee et al., 2025).

Thalamic nuclei changes and deep subcortical nuclei changes represent promising biomarkers for the diagnosis and monitoring of neurodegeneration in both HIC and LATAM countries.

