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MICROSTRUCTURAL CHANGES REVEALED BY DIFFUSION TENSOR IMAGING (DTI) IN ALZHEIMER'S DISEASE

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Background: Alzheimer's disease (AD) is a progressive and degenerative Process in gray (GM)) and White (WM) matter of the human brain. Recent studies have been focused on pre symptomatic microstructural changes that will assist the early diagnosis of AD. To date Magnetic resonance imaging (MRI) based microstructural changes research looked into neuronal destruction in gray matter whereas, there are fewer studies on white matter abnormality.

Methods: Long term DTI data from the Alzheimer's disease Beginning in 2 database were used to test. (A): the within-group microstructural white matter changes in Samples with AD and healthy controls at baseline and The first six months ; and (B): the between-group microstructural changes differences in Samples with AD and healthy controls at both Time points.

Results: (A): Within-group: longitudinal Tract-Based study disclose that Samples with AD and healthy controls both had decreased fractional anisotropy (FA) and increased mean diffusivity (MD) with changes in the hippocampal cingulum exclusive to the AD group. (B): Between-group: relative to healthy controls, Samples with AD had lower FA and higher MD in the hippocampal cingulum, as well as the corpus callosum, internal and external capsule; corona radiata; posterior thalamic radiation; superior and inferior longitudinal fasciculus; fronto-occipital fasciculus; cingulate gyri; fornix; uncinat fasciculus; and tapetum

Conclusion: The results of current study highlight that sensitivity toward white matter microstructure is a promising target for AD microstructural changes research. Further longitudinal studies on both white and gray matters are recommended to get a deeper understanding of these microstructural processes.

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