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COMPARISON OF BRAIN MORPHOLOGY IN ALZHEIMER'S DEMENTIA IN THE GENERAL POPULATION AND DEMENTED SUBJECTS WITH DOWN'S SYNDROME

D. Mullins¹, E. Daly², A. Simmons^{3,4}, P. Johnston², K. Murphy¹, S. Lovestone^{4,5}, D. Murphy^{2,4}

¹Royal College of Surgeons in Ireland, Dublin, Ireland, ²Department of Psychological Medicine, ³Department of Clinical Neuroscience, Institute of Psychiatry, King's College, ⁴NIHR Biomedical Research Centre for Mental Health, South London and Maudsley NHS Foundation Trust and King's College London, Institute of Psychiatry, ⁵MRC Centre for Neurodegeneration Research, Institute of Psychiatry, King's College, London, London, UK

Aim: To compare Magnetic Resonance Imaging (MRI) findings in Alzheimer's dementia (AD) in the general population with Down's syndrome dementia.

Background review: AD is characterised by cognitive dysfunction interfering with activities of daily living. Mild cognitive impairment (MCI) is an intermediate state between normal aging and dementia. People with Down's syndrome have an increased risk of developing AD. AD pathology initially appears in the entorhinal cortex, followed by the hippocampus and later in the temporal lobes. These areas are critical for memory functioning.

Method: Volumetric analysis was performed on MRI brain scans using Measure software. Manual tracing was undertaken for the hippocampus, temporal lobes and lateral ventricles as well as the total brain volume of the cerebral hemispheres and cerebellum. Brain volumes were normalised as a percentage of traced intracranial volumes. Freesurfer software was used to obtain entorhinal cortical thickness measures. Statistical analysis was undertaken using SPSS15.

Results: Subjects with AD (n=46), MCI (n=28) and controls (n=39) were compared with Down's syndrome demented subjects (DS+, n=20), non-demented subjects with Down's syndrome (DS-, n=45) and age-matched controls (n=43). Hippocampi, entorhinal cortex and temporal lobes were significantly reduced in AD and DS+ compared to controls. Lateral ventricles were significantly increased in AD and DS+ compared to controls. MCI and DS- produced findings between those of dementia and controls.

Conclusions: Critical memory regions atrophy in dementia corresponding to decreased cognitive functioning. DS+ morphology is comparable to AD in the general population but the atrophy is less pronounced.