Biology and Pathology

Central Nervous System

Impact of Molecular Brain Imaging on Patient Management

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Learning Objectives:

- Describe the most common neurodegenerative dementia types.
- Identify molecular imaging characteristics that distinguish among dementias.
- Identify the common movement disorders with nigrostriatal degeneration.
- Describe molecular imaging approaches for detection of nigrostriatal lesions / damage.

Molecular brain imaging approaches have identified several features in patients with neurodegenerative dementias and with neurodegenerative movement disorders. These include characteristic features in measures of cerebral glucose metabolism, neuroreceptor and transporter imaging and detection of pathological protein depositions. Several of these research measures have become recently available in clinical neuroimaging, and offer the promise of improving diagnostic accuracy, informing of patient prognosis and directing the use of medical therapy. Applications in the distinction of degenerative dementia types including Alzheimer disease, dementia with Lewy bodies and frontotemporal dementia will be discussed. Additionally, distinctions among neurodegenerative extrapyramidal movement disorders on the basis of presynaptic nigrostriatal dopamine terminal lesions will be introduced. Molecular radiotracers necessary for these clinical distinctions are now FDA-approved and available.

Relevant Publications:

1. Kotagal V, Albin RL, Müller ML, Koeppe RA, Frey KA, Bohnen NI. Gender differences in Cholinergic and Dopaminergic deficits in Parkinson disease. Journal of Neural Transmission. March 27th, 2013.

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