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SPECT Imaging Differences in Adults versus Older Adults with Dementia

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Objective: To investigate whether age affects cerebral blood flow in individuals with dementia at baseline and while concentrating. Method: 709 individuals with dementia diagnosed by DSM-IV criteria were given a single photon emission computed tomography (SPECT) scan as part of a comprehensive evaluation. Participants included 368 males and 341 females. 347 individuals were between the ages of 50 and 64 (49%) and 362 individuals were between the ages of 65 and 94 (51%). Baseline SPECT and SPECT while taking the Connors CPT (activation) were generated. An activation score was generated by subtracting *z*-scores for the baseline from *z*-scores for the concentration phase. Results: At the .001 level, *t*-tests revealed differences in the younger adults as compared to the older results in multiple regions (20) during activation primarily in the temporal lobe and the supramarginal gyrus. The temporal lobe showed more activation with the greatest activation occurring in the inferior temporal gyrus and the middle temporal gyrus. Conclusion(s): Based on the SPECT images, there is a decrease in activation in the temporal lobe of the brain in older adults with dementia. During the Connors CPT, cerebral blood flow should be greater due to the attention-related tasks of the assessment. The degree of increase was much smaller in the older dementia subjects showing an increasing inability to increase activity under demand conditions. This would impair the ability to respond to the increased demands of the task.

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