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# Neuropathology in the LifeAfter90 Study: Update on an Ethnically Diverse Cohort Study of Oldest-Old

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## Abstract

**Background:** Neuropathology studies of the oldest-old have significantly advanced our understanding of the multiple etiologies late in very late life; however, this has been limited to studies of oldest-old non-Hispanic white (NHW) decedents. Our goal was to characterize neuropathology in a cohort of diverse oldest-old decedents.

**Method:** The Life after 90 study is an ongoing cohort study of members of Kaiser Permanente Northern California, aged 90+ with targeted recruitment of individuals across different racial/ethnic groups with no prior diagnosis of dementia in their medical record. Participants are examined on average every 6 months. Brain donation was available to all interested consenting participants. Neuropathology was assessed using the National Alzheimer's Coordinating Center Neuropathology form v. 10.

**Result:** As of January 2022, 216 participants (26% of sample) were enrolled in autopsy (autopsy enrollees: 20% Asian, 15% African American, 17% Latino, 9% Multiracial/Other, and 39% NHW) with 25 deceased and neuropathological evaluations completed. Average age of death was 95 years (range 91-106), 13 (62.5%) were female, 6 Latino, 14 NHW, 3 Multiracial, 1 Asian, and 1 African American. At final clinical exam, 3 participants had dementia (12%), 8 questionable/mild cognitive impairment (32%), and 14 were cognitively normal (56%). With respect to Alzheimer's disease (AD) neuropathologic diagnosis, 8 met criteria for intermediate likelihood (32%), 11 low (44%), and 6 did not have AD (24%); none had high AD likelihood. All participants had some level of neurofibrillary tangles (NFTs); median Braak NFT stage was II (range I-V). Six participants lacked plaques, and highest Thal phase was 4. Eleven participants (44%) had Lewy bodies. Hippocampal sclerosis was seen in 1 participant, whereas TDP-43 inclusions were detected in 5 (20%). Cerebral amyloid angiopathy was seen in 13 participants (25%). The most common assessed pathologies were age related tau astrogliopathy in 19 participants (76%) and some degree of arteriolosclerosis in 24 participants (96%) although only 4 were considered to have severe arteriolosclerosis.

**Conclusion:** This diverse cohort of oldest-old individuals indicate numerous brain pathologies are present with advanced age, albeit most participants having mild severity and distributions of pathologies providing further evidence of the complex and multifactorial nature of clinic-pathological correlations.