

The Influence of Age on the Peripheral Nervous System

Achilles tendon reflexes, distal vibratory sense, and sural nerve amplitudes decrease with age in older adults, even without neuropathy.

The prevalence of axonal polyneuropathy increases with age. However, accurate diagnosis can be challenging, as signs attributed to polyneuropathy have also been observed with increasing frequency in older adults without neuropathy. To quantify age-related changes, researchers examined a cohort of 4179 adults 40 years of age or older (mean, 65 years) enrolled in the population-based Rotterdam study. Exclusion criteria were a diagnosis of polyneuropathy by a neurologist or at least two of the following: ≥ 3 of 12 polyneuropathy symptoms, ≥ 2 findings on lower limb examination, or sural sensory nerve action potential (SNAP) amplitude $< 4.0 \mu\text{V}$.

Among the 3780 (90.5%) participants without neuropathy, differences with age were most pronounced for vibration sense, tested at the hallux, and Achilles tendon reflexes, with the greatest differences occurring after 60 years. Mean Rydel-Seiffer tuning fork vibration score decreased from 6.6 for participants 40 to 49 years old to 3.6 for participants older than 80 years. Achilles reflexes were decreased or absent in 18.8% of participants in their 40s and 63.4% of participants older than 80 years. Patellar tendon reflexes and superficial pain sensation were more stable. SNAP amplitudes nonlinearly declined with age (median amplitude at 40–49 years, $12.3 \mu\text{V}$; > 80 years of age, $4.0 \mu\text{V}$). SNAP was nonrecordable in 25% of participants older than 80 years.

COMMENT

The observation that functional and electrophysiological changes in the peripheral nervous system occur with aging is not novel, and the possibility of other conditions in this cohort contributing to these differences was not accounted for. However, this large data set can inform interpretation of the neurologic exam and nerve conduction studies in the individual. Following these participants over time may reveal whether any of these differences predict risk for future neuropathy or certain comorbidities. — *Leana Doherty, MD*

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