

# Cigarette smoking associated with increased risk of developing ALS

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Cigarette smoking may be associated with an increased risk of developing the muscle-wasting disease amyotrophic lateral sclerosis (ALS), according to a report in the February issue of *Archives of Neurology*.

"[Amyotrophic lateral sclerosis](#) (ALS) is a [neurodegenerative disorder](#) of motor neurons affecting more than 5,500 newly diagnosed patients every year in the United States," according to background information in the article. "There is no cure for ALS, and the few available treatments have limited efficacy. About 90 percent of ALS cases are sporadic and of unknown, possibly environmental, origin."

To examine the association between cigarette smoking and ALS, Hao Wang, M.D., Ph.D., of the Harvard School of Public Health, Boston, and colleagues analyzed data from five different long-term studies involving a total of more than 1.1 million participants, of whom 832 had ALS. Follow-up ranged from seven to 28 years.

The rates of ALS in the five studies combined increased with age, and were higher in men than women for all age groups. Those who had ever smoked [cigarettes](#) at the beginning of the study had an increased risk of ALS compared with those who had never smoked. Current [smokers](#) had a 42 percent increased risk of developing the disease and former smokers had a 44 percent increased risk.

The risk of developing ALS also increased as the number of pack-years smoked (product of the number of packs per day and the number of years that quantity was smoked). Additionally, the average number of cigarettes smoked per day and the duration of smoking were positively associated with ALS when examined independently and not combined into pack-years. The risk of developing ALS increased by 10 percent for each increment of ten cigarettes smoked per day and by 9 percent for

each 10 years of smoking; however, these associations did not persist when never-smokers were excluded. Among those who smoked, the risk of ALS increased as the age they started smoking decreased.

"Several possible mechanisms by which cigarette smoking might influence the risk of ALS have been suggested, including direct neuronal damage from nitric oxide or other components of cigarette smoke (such as residues of pesticides used in tobacco cultivation) or from oxidative stress," the authors write. "Chemicals that are present in cigarette smoke generate free radicals and products of lipid peroxydation, and smokers have a higher turnover of the major antioxidant vitamin C. Exposure to formaldehyde, a by-product of the combustion product of tobacco smoking, was reported in 2008 to be associated with an increased risk of ALS."

"Better understanding of the relation between smoking and ALS may further the discovery of other risk factors and help elucidate the nature of the disease," they conclude.

**More information:** Arch Neurol. 2011;68[2]:207-214.

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