More Neurosurgeons Could Reduce Vehicle Accident Deaths

Researchers at Dartmouth-Hitchcock Medical Center in Lebanon, New Hampshire have found an association between increasing the distribution of neurosurgeons throughout the United States and decreasing the risk of death from motor vehicle accidents (MVAs). The findings of their study are described in the article *Increased population density of neurosurgeons associated with decreased risk of death from MVAs in the United States* by Atman Desai, M.D., and colleagues, published online, ahead of print, in the *Journal of Neurosurgery*.

The researchers reviewed some basics about MVAs, the leading cause of death in the United States among young persons (1 to 34 years of age). The primary cause of death arising from MVAs is traumatic brain injury, whose treatment is generally handled by neurosurgeons. Motor vehicle accidents are more likely to result in fatalities in rural settings, which some attribute to a slow medical response time and reduced access to trauma resources. For the most part, neurosurgeons are clustered in and around cities that house tertiary care hospitals, and thus there is an uneven distribution of this specialty throughout the U.S. Bearing these facts in mind, the authors hypothesized that an increased population density of neurosurgeons would decrease the risk of death from an MVA.

In the 3,141 U.S. counties that were examined, the mean number of MVA-related deaths per million persons was 226. The average number of neurosurgeons per county was six. The greatest number of neurosurgeons in a county was 372; most counties had none. In an unadjusted analysis, the authors found that an increase of one neurosurgeon per million population was associated with 1.9 fewer deaths due to MVAs per million population.

In a multi-variate analysis, in which adjustments were made for county urbanicity, socioeconomic conditions and density of general practitioners, an increase of one neurosurgeon was associated with 1.01 fewer deaths from MVAs per million population. This association was present regardless of whether the county was rural or urban. When Desai and colleagues compared the association between deaths from MVAs and the distribution of other medical specialties, the researchers found that an equivalent decrease in MVA-related deaths (one fewer death) would require an addition of 33 primary care providers. According to another study, an addition of six general surgeons per million population would be needed for the same affect. Rural setting, persistent poverty, and low level of education were all associated with significant increases in MVA-related deaths.

Given the association found between the distribution of neurosurgeons and MVA-related deaths, Desai and colleagues conclude that the availability of local neurosurgeons may be important for the overall likelihood of surviving an MVA, and

thus neurosurgical education and practice throughout the U.S. should be promoted.

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