

# Elderly may have higher blood pressure in cold weather

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Outdoor temperature and blood pressure appear to be correlated in the elderly, with higher rates of hypertension in cooler months, according to a report in the January 12 issue of *Archives of Internal Medicine*.

Seasonal variations in blood pressure have been recognized among the general population for 40 years, according to background information in the article. However, few previous studies have looked specifically at older adults. "Elderly persons may be particularly susceptible to temperature-related variations in blood pressure," the authors write. "The baroreflex, which is one of the mechanisms of blood pressure regulation, is modified in elderly subjects, and it has been hypothesized that disorders of baroreflex control and enhanced vasoreactivity [sensitivity of blood vessels] could contribute to the aging-associated increase in cardiovascular morbidity [illness]."

Annick Alpérovitch, M.D., of the Institut National de la Santé et de la Recherche Médicale, Paris, and colleagues assessed the relationship between blood pressure and temperature in 8,801 individuals 65 or older. All were part of the Three-City study, conducted in three French metropolitan areas. Participants' blood pressure was measured at the beginning of the study (starting in 1999) and again about two years later. Outdoor temperatures on the day of measurement were obtained from local meteorological offices.

Both systolic (top-number) and diastolic (bottom-number) blood pressures differed across the four seasons and across the distributions of

outdoor temperatures. Average systolic blood pressure was 5 millimeters of mercury higher in winter than in summer. High blood pressure—defined as a systolic blood pressure of 160 millimeters of mercury or higher, or a diastolic blood pressure of 95 millimeters of mercury or higher—was detected in 33.4 percent of participants during winter and 23.8 percent during summer.

On average, each individual's blood pressure decreased between the initial and follow-up measurements. This decrease was also strongly correlated with outdoor temperature. "The higher the temperature at follow-up compared with baseline, the greater the decrease in blood pressure," the authors write. These differences over time were larger in participants age 80 and older.

"Mechanisms that could explain the association between blood pressure and temperature remain undetermined," the authors continue. The sympathetic nervous system (which helps control involuntary actions, such as stress response) is activated and the hormone catecholamine is released in response to cold temperatures, which may increase blood pressure by speeding the heart rate and decreasing the responsiveness of blood vessels, they suggest.

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