

Seasonal variation in blood pressure

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A French study reported in the 12th January issue of *Archives of Internal Medicine* has found a strong correlation between blood pressure and outdoor temperature in a large sample of the elderly.(1) As a result, the investigators advise that, during periods of extreme temperatures, careful monitoring of blood pressure and antihypertensive treatment "could contribute to reducing the consequences of blood pressure variations in the elderly".

The study, which monitored 8801 participants over the age of 65 in the French Three-City study, found that systolic and diastolic blood pressure values differed significantly across the four seasons of the year and according to the distribution of outdoor temperature. The higher the temperature, the greater the decrease in blood pressure. Systolic blood pressure, for example, decreased with increasing temperature, with an 8.0 mmHg decrease between the lowest (

Average systolic blood pressure was 5 mmHg higher in winter than in summer. High blood pressure, defined as a systolic blood pressure of 160 mmHg or higher, or a diastolic blood pressure of 95 mmHg or higher, was detected in 33.4 per cent of participants during winter and 23.8 percent during summer. These changes in blood pressure were greater in subjects 80 years or older than in younger participants.

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. Participants in the Three-City study were from Bordeaux, Dijon

and Montpellier.

"Although our study does not demonstrate a causal link between blood pressure and external temperature, the observed relationship nevertheless has potentially important consequences for blood pressure management in the elderly," the authors state. "Because the risk of stroke or aneurysmal rupture is highest in the elderly, improved protection against these diseases by close monitoring of blood pressure and antihypertensive medication when outdoor temperature is very low could be considered."

Speaking on behalf of the European Society of Cardiology (ESC), Professor Frank Ruschitzka from the University Hospital, Zurich, says that the study reaffirms the place of the elderly as a target group for blood pressure monitoring. "The elderly, especially the increasing number of octogenarians, should not be neglected. They need extra care, and will benefit from monitoring and appropriate treatment. This study emphasises the need for year-round vigilance."

One possible explanation for the study findings, adds Professor Ruschitzka, lies in the emerging link between vitamin D and blood pressure. The elderly, especially those in care homes, are subject to vitamin D deficiency, largely as a result of their limited exposure to sunlight, and vitamin D deficiency can predispose to hypertension via activation of the renin-angiotensin-aldosterone system. "The benefit of sunlight on vitamin D levels in the elderly is under appreciated," says Professor Ruschitzka. "Fifteen minutes exposure to sunlight can produce the equivalent of 2000 international units vitamin D."

A report from the Framingham Heart Study published in 2008 found that moderate vitamin D deficiency nearly doubles the risk of myocardial infarction, stroke and heart failure over a mean of 5.4 years in patients with high blood pressure.(2) The Nurses Health Study, also

reporting in 2008, found that lower blood levels of vitamin D are independently associated with an increased risk of hypertension; women with the lowest levels had a 66 per cent higher incidence of hypertension than those with the highest levels.(3)

References:

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