

Weather and cardiovascular disease

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There is seasonal variation in cardiovascular mortality with an increased risk for an acute coronary event during wintertime [1], and seasonal variations and ambient temperature are associated with the level of blood pressure [2,3]. Thus, seasonality of cardiovascular disease may be important to account for in studies. Whether cardiovascular disease is associated with other meteorological parameters than temperature and snow is, however, not well studied. A recent study by Mohammad and collaborators [4] now adds to our understanding on this.

This study [4] used information from the SWEDEHEART registry, a nationwide Swedish registry including all patients admitted to Swedish coronary care or intensive care units with symptoms suggestive of an acute coronary syndrome, and data from the Swedish Meteorological and Hydrological Institute, collecting data from 132 weather stations across the country. Information on air temperature, wind, duration of sunshine, air pressure, humidity, and precipitation was used. The study collected data from 1998 to 2013 (inclusive) and obtained data for 274 029 patients with an acute myocardial infarction and matched meteorological information at the time of the event (and 7 days before) in the same area as the hospitalization took place for the individual patient.

The authors show that the risk of an acute myocardial infarction was inversely related to temperature, with a 1 standard deviation (7.4 degrees centigrade) increase being associated with a 2.8% (95% confidence interval 3.3–2.3%; $P < 0.001$) reduced risk of a coronary event [4]. Furthermore, low atmospheric air pressure, high wind velocity, and shorter duration of sunshine were also associated with higher risk of an acute myocardial infarction, whereas wind velocity was directly related to a coronary event.

Sudden plaque rupture in a coronary artery with subsequent thrombosis causes most acute myocardial infarctions. This acute event differs from hypertension, a condition with slow progression and generally no acute onset, although this may be the case in certain hypertensive emergencies. Hypertension is a risk factor for acute coronary disease. However, the association to stroke and to heart failure is stronger than to myocardial infarction. Thus it would be of interest to study how seasonal variations and weather conditions associate also with stroke and heart failure. High quality national event registries for both stroke and for heart failure are available (in Sweden and in other countries) and would make such analyses feasible.

Finally, the study by Mohammad and collaborators [4] also nicely show how large registries and available existing databases can be linked and used to study complex issues to provide new knowledge, complementary to other traditional study designs.

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