Cold

Cold tumor microenvironment

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A retrospective study was performed to investigate seasonal variation in stroke incidence and to evaluate the hypothesis that cold might be a risk factor. Data were obtained from the central registry of the Hospital de S. João, Porto, Portugal, concerning 4048 patients consecutively admitted for cerebrovascular disease during a period of 33 months. Monthly admissions for stroke and its subtypes were related to mean values of ambient temperature using linear correlation. There was a strong inverse correlation between average temperature and total admissions for cerebrovascular disease ($r = -0.72$, $P < 0.00005$), Intracerebral hemorrhage ($r = -0.66$, $P < 0.00005$), ischaemic stroke ($r = -0.46$, $P = 0.007$) and transient ischaemic attack ($r = -0.41$, $P = 0.017$). These correlations were independent of any seasonal variation in the number of hospital admissions due to all causes. No relation was found between temperature and subarachnoid haemorrhage. The rhythmometric analysis showed the presence of a statistically significant rhythm with an acrophase in the coldest months. These results support the hypothesis of stroke being a chronorisk disease to which cold might represent a triggering factor [1].

A winter excess of ischaemic stroke has been found in mortality and hospital-based studies. It is often assumed that this is due to seasonal variation in stroke incidence and several pathophysiological explanations have been proposed. We studied the incidence of stroke in relation to season and outside temperature.

The data came from a community-based study of first ever in a lifetime stroke in a defined population of about 105 000. 675 such strokes were registered over four years and the month of inset was analysed separately for cerebral infarction, primary Intracerebral hemorrhage, and subarachnoid haemorrhage.

There was no significant seasonal variation. The incidence of primary Intracerebral hemorrhage was increased at low temperatures, but there was no significant relation between the incidence of ischaemic stroke or subarachnoid haemorrhage and temperature.

The widely reported winter excess of ischaemic strokes may be an artifact due to referral bias in hospital-based studies and increased case fatality during the winter in mortality studies [2].

Cold-related intracerebral hemorrhage [3].

1)
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3)
Caplan LR, Neely S, Gorelick P. Cold-related intracerebral hemorrhage. Arch Neurol. 1984 Feb;41(2):227. PubMed PMID: 6691832.