Disease Specific Seasonal Influence- Geography and Economy Maters

Seasonal clustering of various neurological and non-neurological diseases has been reported in medical literature, especially in diseases with environmental, biological, and meteorological influences. Immune-mediated diseases such as Guillain–Barre syndrome (GBS), acute disseminated encephalo-myelitis, and acute transverse myelitis are affected by seasonal occurrence of various triggering infections. In a study from north India, seasonal influence of GBS was evaluated in 324 patients; acute inflammatory demyelinating polyradiculoneuropathy (AIDP) was more frequent in rainy season (25.7%) compared to acute motor axonal neuropathy (AMAN, 11.1%), whereas AMAN occurred during summer (42.2% vs 22.5%).[1] In Western countries, clustering of GBS during winter has been reported.[2] This difference in clustering may be attributed to seasonal prevalence of infection in different countries. In Asian or resource-poor countries, water and arthropod-born infections are common; whereas in temperate and developed countries influenza-like illnesses are more common. Myasthenia gravis and migraine precipitate during extremes of summer and winter. Intracerebral hemorrhage occurs more frequently in winter and ischemic stroke in summer.[3,4] Ambient temperature may affect blood pressure and blood coagulability. Healthy volunteers exposed to 40°C for 6 hours had increased hematocrit by 9%, blood viscosity by 24%, platelets by 18%, and plasma cholesterol by 14%. Their core temperature raised to 0.84°C, heart rate by 32/minute, and reduction in body weight by 1.83 kg due to sweating despite accessibility to water and fall in blood pressure.[5] Platelet adhesion increased by five folds when hematocrit increased from 10% to 40%.[6] Red blood cell can also generate some particles, which can result in platelet aggregation and enhance coagulation.[7] Hypothermia also enhances fibrin formation and increase platelet activation.[8,9] Increase in incidence of intracerebral hemorrhage during winter may be due to increase in blood pressure as a result of increased sympathetic activities, reduced fluid loss, and sodium. Cerebral venous sinus thrombosis (CVST) is a rare stroke-like illness. In South-East Asia, CVST has been reported more frequently during puerperium in earlier studies, but this notion has been blurring in recent studies, and may be due to availability of investigative facilities of underlying prothrombotic conditions.[10] In the present issue, Aaron *et al*. have reported seasonal influence in the occurrence of CVST. The frequency of CVST was the highest during summer (42.3%), followed by autumn (32.7%) and winter (25%). Females and younger patients were more vulnerable during summer, although CVST was independent of humidity and cloud.[11] Ferro *et al*. reported the highest frequency of CVST during autumn and winter.[12] Stolz *et al*. found higher frequency of CVST in summer and winter.[13] Winter peak has been attributed to thrombogenicity triggered by viral and bacterial infection, and summer incidence to dehydration. Salehi *et al*. found correlation of CVST occurrence with ambient temperature. They reported the highest incidence of CVST during July to September (1.69/month/year) and the lowest during December to April (0.83/month/year).[14] Seasonal influence, however, was not related to clinical severity and outcome in most studies. There is a limitation in deciding the exact onset of CVST unlike intracerebral hemorrhage and thrombotic or embolic stroke. The onset in CVST is mainly subacute (3–30 days) on chronic (>30 days).[10,12] In an individual with inherent prothrombotic conditions, various infections, environmental, or dietary factors may enhance thrombosis, which needs further studies. Identification of such factors may go a long way in the prevent CVST.

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