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Differences of Hemorrhagic and Ischemic Strokes in Age Spectra and Responses to Climatic Thermal Conditions

Pan Ma

Chengdu University of Information Technology, school of Atmospheric science, school of Atmospheric science, China
(mapan@cuit.edu.cn)

The risks of Emergency Room (ER) visits for cerebral infarction (CI) and intracerebral hemorrhage (ICH) is found to differ in different age groups under different climatic thermal environments. Based on CI and ICH related ER-visit records from three major hospitals in Beijing, China, from 2008 to 2012, the advanced universal thermal climate index (UTCI), was adopted in this study to assess the climatic thermal environment. Particularly, daily mean UTCI was used as a predictor for the risk of ER visits for CI and ICH. A generalized quasi-Poisson additive model combined with a distributed lag non-linear model was performed to quantify their association. The results indicated that (□) the highest growth rate of ER visits for ICH occurred in age 38 to 48, whereas an increasing ER admissions for CI maintained at age 38 to 78. (□) The frequency distribution of UTCI in Beijing peaked at -8 and 30 °C, corresponding to moderate cold stress and moderate heat stress, respectively. (□) Correlation analysis indicated that ICH morbidity was negatively correlated with UTCI, whereas occurrence of CI showed no significant association with UTCI. (□) The estimated relative risk of ER visits corresponding to 1 °C change in UTCI, which was then stratified by age and gender, indicated that all sub-groups of ICH patients responded similarly to thermal stress. Namely, there is an immediate ICH risk (UTCI = -13 °C, RR=1.35, 95% CIs: 1.11~1.63) from cold stress on the onset day, but non-significant impact from heat stress. As for CI occurrences, no effect from cold stress was identified, except for only those aged 45 to 65 were threatened by heat stress (UTCI = 38 °C, RR=1.64, 95% CIs: 1.10~2.44) on lag 0~2d.