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Asian dust storms and emergency admissions for cardiovascular and respiratory diseases in Taipei, Taiwan

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Dust storms originating in the deserts of Mongolia and China make their way to Taipei metropolitan areas, especially in winter and spring. Every dust storm coming alert is recorded and published by Taiwan Environmental Protection Administration (EPA) from 1994 until now. Some studies constructed the association between particulate matter and human health, and particulate matter, such as particulate matters with aerodynamic diameter less than 10μm (PM_{10}), is one of the main components in dust storm. The objective of this study was to access the effects of dust storms on the hospital emergency admissions in Taipei metropolitan areas, Taiwan, during the period from 1995 to 2002. We identified 52 dust storm events and 52 non-dust storm events, and used Student's t-test to make comparison between them for cardiovascular diseases (International Classification of Disease, 9th revision-Clinical Modification (ICD-9-CM) codes 410-411, 414, 430-437), severe respiratory diseases (ICD-9-CM codes 486, 493, 496), and light respiratory diseases (ICD-9-CM codes 460-465, 466, 472-473, 477). The significant effects of dust storms are in the cardiovascular diseases and light respiratory diseases, which hospital emergency admissions in dust storm events are 14.1% and 25.8%, respectively, higher than those in dust storm events. Specifically, hospital emergency admissions for cardiovascular diseases in 1-day events and for light respiratory diseases in 1-day and 2-day events all are three cases which have statistically significant difference with p-value 0.007, 0.032, and 0.005 between dust storm events and non-dust storm events. In conclusion, this study demonstrated that dust storm can influence adverse human health for cardiovascular diseases and light respiratory diseases, but there is not enough evidence for severe respiratory diseases to show the same result as cardiovascular diseases and light respiratory diseases.

Keywords: dust storms; air pollution; emergency admissions; epidemiology.