Higher Frequency of Stroke Deaths on Monday and Saturday

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Introduction: There is a controversy about the association of days of the week and incidence, case-fatality, and mortality rates from cerebrovascular diseases. Monday and weekends have been considered as the days of higher risk for both event and death. However, there is little data analyzing the distribution of stroke deaths controlling for contextual variables as neighborhood and social inequality indexes. These social variables can be considered as a surrogate for access to emergency care and quality of hospitalization. Hypothesis: To verify if socioeconomic variables can change the distribution of stroke deaths during the days of the week. Methods: The Estudo de Mortalidade e Morbidade do Acidente Vascular Cerebral - EMMA Study is a surveillance study addressing mortality and morbidity from cerebrovascular diseases in Sao Paulo, Brazil. From 1996 to 2005, we analyzed the distribution of the 57,984 stroke deaths among people aged 30 to 79 years-old according to days of the week. We used data from the mortality data system with a complete coverage and good quality surveillance of all deaths. Data was obtained day by day. We designed a generalized model to evaluate stroke death rates according to day of the week adding other variables as age (10-year age-strata), gender, temporal trend during 1996-2005 (linear), a 6-day lag average temperature (quadratic), month of the year, and area of residence. São Paulo is organized into 96 districts that were classified into nine geographical areas. (Central, West, North-1, North-2, South-1, South-2, South-3, East-1, and East-2) We did an analysis changing the variable “area of residence” by the “social exclusion index”. This index is composed by variables as unemployment rate, homicide rate, proportion of illiteracy, and of teenagers for each neighborhood. It varies from zero (more exclusion) to one (more inclusion). We chose Thursday as the reference day because the lowest variance of deaths was observed in this day. Results: Considering Thursday as reference, the relative risks (and 95% confidence interval) of death according the days of week were: Friday: 1.027 (0.991 to 1.064); Saturday: 1.042 (1.006 to 1.080); Sunday: 1.025 (0.989 to 1.062); Monday: 1.052(1.016 to 1.090); Tuesday: 1.002 (0.967 to 1.038); Wednesday: 1.012(0.977 to 1.049). Changing the geographical area according to the social exclusion index for each district of residence did not materially change this association. The distribution of stroke deaths according to days of the week is similar for all areas of residence. Conclusion: In spite of controlling age, gender, sex, temporal trends, temperature, geographical area and social exclusion indexes, stroke deaths were more frequent on Mondays and Saturdays.