

CORRELATION AND INFLUENCE OF WEATHER VARIABLES WITH ACUTE MYOCARDIAL

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SUMMARY

Introdução: Unsurprisingly climate change affects direct and indirectly human health, but there never had much attention to research involving issues related to environmental variables and human health. The World Health Organization warns that cardiovascular diseases are responsible for leading causes of death and disability worldwide and is the main cause of death in Brazil. Humans maintain their internal temperature regardless of outside, through different thermoregulatory processes according to their exposure to hot or cold, thus the thermal regulation may require a metabolic cost that the body is not always able to accomplish. Under these conditions the state of health may be compromised.

Objectives: The purpose of this study was to evaluate changes in meteorological variables and correlations with acute myocardial infarction in Campina Grande, Paraíba State, Brazil, between the years 2000 to 2009, identifying the occurrence of acute myocardial infarction due to weather variations and getting their relation to seasonal variations.

Methodology: The studied area, in Campina Grande - Paraíba, Brazil, is located at 07°13'50" south latitude and 35°52'52" west longitude, altitude 543 m, with an area of 621 Km² and with a population of approximately 383.764 inhabitants. In this paper, we analyzed diagnoses of acute myocardial infarction monthly, a total of 2.702 cases. There were made 120 observations during these ten years studied, based on the media of each year. The meteorological data were collected in the main meteorological station of the National Institute of Meteorology (INMET). This study attempts to make a relation of climatic factors with the occurrence of morbidity and mortality from acute myocardial infarction, through the monthly averages of meteorological

variables (independent variables). For the analysis of meteorological variables, data were standardized to apply statistical techniques, considering the methods of principal component analysis (PCA), smoothing Series Through the Use of Moving Averages, Linear Regression, Multivariate Analysis (ARLM) as well as the statistical tool SPSS ® for Windows 9.0.

Results: Results were obtained through observations made according to 10 variables. The variables were placed in the statistical package SPSS for Windows®, and then was made the multivariate linear regression. For cases of acute myocardial infarction, PCA was made and four CPs were obtained where, through the total variance explained, the values were truncated above one and the inertia test showed which variable groups were chosen. Thus, it was observed that the studied variable related to the first CPs was directly proportional to the maximum temperature, temperature range, getting sunstroke, wind speed and evaporation while it's inversely proportional to relative humidity and rainfall. We used the Kaiser-Meyer-Olkin (KMO) and Bartlett's test that corresponded to 76.6%, demonstrating that the data fit the methodology which considers over 70% correlation being optimum.

Conclusion: The results show that the maximum and minimum temperatures have a direct correlation with acute myocardial infarction, as well as getting sunstroke, wind speed and evaporation.

Bibliography:

AYOADE, J. O. Introdução à climatologia para os trópicos. 12ª Edição. Rio de Janeiro: Bertrand Brasil, 2007.

Artaxo, P.; Correia, A. L.; Maenhaut, W. "Measurements of Atmospheric Aerosols in the Antarctic Peninsula From 1985 to 1996". Melbourne 2007.

DE Garín, A. y Bejarán, R. 2001: Temperatura y Emergencias Cardiovasculares en Lomas de Zamora (Argentina). Anales del Congremet VIII, Buenos Aires, Mayo de 2006.

Hobbs, J. E. Weather And Human Behavior. Applied Climatology: A Study Of Atmospheric Resources. New York, Dawson West View Press, 2005.

JACKSON, G. Tudo sobre doenças cardíacas. São Paulo, Org. Andrei, 2000.

TORTORA, G. J. O. Sistema Circulatório. In: Corpo Humano: fundamentos de anatomia e fisiologia. Porto Alegre: Arned Editora, 2008.

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