CENTERS FOR DISEASE CONTROL

June 19, 1981 / Vol. 30 / No. 23

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

Epidemiologic Notes and Reports

Heatstroke — United States, 1980

During the summer heat wave of 1980, deaths in the United States due to the heat were estimated at 1,265 (*1*). An investigation by state and local health officials and CDC (*2,3*) found 784 deaths and severe illnesses which could be attributed to heat in the 2 cities of St. Louis and Kansas City, Missouri, in 1980.

The investigation included a review of the demographic characteristics of 208 heatstroke cases* and a case-control study of 156 of these cases. Heatstroke rates in persons age 65 or older were 12 to 13 times the rates in the remainder of the population. Low socioeconomic status and race other than white were characteristics also associated with increased rates of heatstroke. Biologic or medical conditions which were associated with heatstroke included inability to care for oneself, alcoholism, mental illness, and the use of certain antipsychotic drugs (phenothiazines, butyrophenones, and thioxanthenes). Heatstroke tended to occur among residents of homes which lacked air conditioning or which were surrounded by only sparse growth of trees and shrubbery. Living on the higher floors of a multistory building was also associated with increased risk, but available data did not clarify whether distance from the ground or proximity to the roof was most important. Reducing activity, spending more time in air-conditioned places (independent of whether or not there was a home air conditioner), and taking extra liquids appeared to be effective preventive measures. Heatstroke patients reported having been warned about danger from the heat less often than controls.

Reported by HD Donnell Jr, MD, State Epidemiologist, Missouri State Dept of Social Services; HL Bruce, MD, W Claseman, MD, St. Louis Div of Health; RM Biery, MD, RL Hotchkiss, MD, GL Hoff, PhD, Kansas City (Missouri) Health Dept; Federal Emergency Management Agency; Div of Surveillance, Hazard Evaluations, and Field Studies and Div of Biomedical and Behavioral Sciences, National Institute for Occupational Safety and Health, Consolidated Surveillance and Communications Activity, Epidemiology Program Office, and Environmental Health Services Div and Special Studies Br, Chronic Diseases Div, Center for Environmental Health, CDC.

Editorial Note: Hot weather is a significant cause of morbidity and mortality in the United States. On the average, high ambient temperature is associated with the deaths of more than 200 Americans annually (*4*). However, summers with sustained periods of very hot weather (heat waves) are associated with even more widespread health effects (*5,6*).

Advanced age is a characteristic strongly associated with risk of heat-related illness (*5,6*). Infants under 1 year of age have also been reported to be at high risk, although this was not apparent in the Missouri study (*7*). Certain groups of young adults may also

*Defined as severe hyperthermia often accompanied by altered mental status and anhidrosis.

Heatstroke – Continued

be at high risk (e.g., military recruits and those occupationally exposed to high temperatures) (*5-8*). Low socioeconomic status has also been associated with high risk of heatstroke, probably functioning not as a cause but as a correlate of a cause or group of causes of heatstroke (*9*). Studies of race and sex as predisposing factors for heat-related illness have yielded inconsistent results (*6,9,10*).

Other high-risk groups include the chronically ill or bedfast, the mentally ill, those taking antipsychotic or anticholinergic drugs, and alcoholics (*5,10-13*).

During heat waves, those at highest risk should avoid the heat as much as possible, staying in the coolest available place (not necessarily indoors). If economically feasible, an air conditioner should be acquired. Otherwise, an effort should be made to spend some time each day in an air-conditioned place. It is important to reduce activity during the heat.

Especially important is adequate fluid intake. Thirst may not be adequate to stimulate complete fluid replacement. As much as 50% more fluid than the amount dictated by thirst may be needed (*14*). However, certain individuals should consult a physician before increasing their consumption of liquid: those with epilepsy or with heart, kidney, or liver disease; those who have fluid-retention problems; and those who are on restricted fluids.

Although adequate salt intake with meals is important, salt tablets are of doubtful benefit and should not be taken unless prescribed by a physician (*14*). Alcohol consumption should be reduced or eliminated during very hot weather.

Programs directed toward the prevention of heatstroke should be targeted preferentially toward inhabitants of urban areas rather than rural and suburban areas, which are at less risk. Widespread dissemination of information warning of adverse health effects of the heat and advising appropriate preventive measures is likely to be beneficial.

The Missouri study offered no support for the widespread distribution of fans as an effective measure for the prevention of heatstroke. Air-conditioned heat-wave shelters, though of greater potential benefit, are apparently underutilized. This problem may be corrected by facilitating access to them and by sponsoring efforts to identify high-risk persons and encouraging them to use shelters.

In the construction of buildings consideration should be given to the prevention of heat-related illness. Architects and builders should be cognizant of the need for utilizing design and construction criteria that maximize air movement and for incorporating provisions for adequate insulation and air-handling equipment. Further environmental assessment is required in urban areas with high heat-related mortality to further clarify the environmental determinants of heatstroke.

Those wishing to contact CDC regarding heat-related illness in the general population should direct their inquiries to the Special Studies Branch, Chronic Diseases Division, Center for Environmental Health. Information on the prevention of occupational heat illness can be obtained from the Division of Biomedical and Behavioral Sciences, National Institute for Occupational Safety and Health.

References

1. Environmental Data and Information Service. Impact assessment: U.S. social and economic effects of the great 1980 heat wave and drought. Washington, DC: National Oceanic and Atmospheric Administration, 1980:12.
2. CDC. Heat wave related mortality – United States. MMWR 1980;29:357-9.
3. CDC. Heat wave-related morbidity and mortality – Missouri. MMWR 1980;29:390-2.
4. National Center for Health Statistics. U.S. mortality data. Extracted from tape containing data for the years 1964 through 1978.
5. Ellis FP. Heat illness. Trans Roy Soc Trop Med Hyg 1976;70:402-25.

Heatstroke — Continued

6. Henschel A, Burton LL, Margolies L, Smith JE. An analysis of the heat deaths in St. Louis during July, 1966. Am J Public Health 1969;59:2232-42.
7. Danks DM, Webb DW, Allen J. Heat illness in infants and young children: a study of 147 cases. Br Med J 1962;2:287-93.
8. Occupational Safety and Health Administration. Hot environments. Cincinnati: National Institute for Occupational Safety and Health. (NIOSH publication no. 80-132). 1980.
9. Schuman SH. Patterns of urban heat-wave deaths and implications for prevention: data from New York and St. Louis during July 1966. Environ Res 1972;5:59-75.
10. Ferris EB, Blankenhorn MA, Robinson HW, Cullen GE. Heat stroke: clinical and chemical observations on 44 cases. J Clin Invest 1938;17:249-62.
11. Zelman S, Guillan R. Heat stroke in phenothiazine-treated patients: a report of three fatalities. Am J Psychiatry 1970;126:12.
12. Wise TN. Heatstroke in three chronic schizophrenics: case reports and clinical considerations. Compr Psychiatry 1973;14:263-7.
13. Adams BE, Manoguerra AS, Lilja GP, Long RS, Ruiz E. Heat stroke: associated with medications having anticholinergic effects. Minn Med 1977;60:103-6.
14. Pitts GC, Johnson RE, Consolazio FC. Work in heat as affected by intake of water, salt, and glucose. Am J Physiol 1944;142:253-9.

Recommendation of the Public Health Service Immunization Practices Advisory Committee

Influenza Vaccine 1981-82

This annual revision of influenza vaccine recommendations updates information on influenza activity in the United States during 1980-81 and provides information on the vaccine to be available for the 1981-82 influenza season.

INTRODUCTION

Influenza virus infections occur every year in the United States but vary greatly in incidence and geographic distribution. Infections may be asymptomatic, or they may produce a spectrum of manifestations, ranging from mild upper-respiratory infection to pneumonia and death. Influenza A and B viruses are responsible for only a small portion of all respiratory disease. However, they are unique in their ability to cause periodic widespread outbreaks of febrile respiratory disease in both adults and children.

Influenza epidemics are frequently associated with deaths in excess of the number normally expected. During the period 1968-1981, more than 150,000 excess deaths are estimated to have occurred during epidemics of influenza in the United States. Preliminary data indicate that excess mortality in the 1980-81 influenza season, especially among the elderly, was the highest recorded since the influenza pandemic of 1968-69.

Efforts to prevent or control influenza in the United States have been aimed at protecting those at greatest risk of serious illness or death. Observations during influenza epidemics indicate that influenza-related deaths occur primarily in chronically ill children and adults and in older persons, especially those over age 65. Therefore, annual vaccination is recommended for these high-risk persons.

Influenza A viruses are classified into subtypes on the basis of 2 antigens: hemag-