New national study highlights dangers of exertional heat-related injuries

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A new study conducted by researchers at the Center for Injury Research and Policy of The Research Institute at Nationwide Children's Hospital examined exertional heat-related injuries that were treated in emergency departments between 1997 and 2006. Exertional heat-related injuries are injuries that occur as a result of exercise or physical activity during warm or hot temperatures. The study found that an estimated 54,983 exertional heat-related injuries, an average of 5,500 cases each year, were treated in emergency departments during the 10-year study period. Overall, half (48 percent) of the injuries were sustained by children and adolescents 19 years of age and younger.

While the public is becoming more aware of the issue of exertional heat-related injuries and deaths due to the high profile cases among athletes, researchers say athletes are not the only ones at risk. The study, released online December 7, 2010 and appearing in the January print issue of the *American Journal of Preventative Medicine*, found that close to one-fourth (21 percent) of exertional heat-related injuries were sustained during "everyday" activities such as yard work (11 percent), home maintenance (5 percent) and miscellaneous activities (5 percent) such as moving furniture. People 40 years of age and older were more susceptible to injuries during "everyday" activities than were younger age groups.

"Many people are not aware that, unlike classic heat-related injuries, exertional heat-related injuries do not require extremely high ambient temperatures to cause harm," said Lara McKenzie, PhD, study co-author

and principal investigator at the Center for Injury Research and Policy at Nationwide Children's. "Making smart choices such as drinking plenty of water, resting in the shade, taking breaks while doing physical work and scheduling physical activities - including yard work and home maintenance - during the cooler parts of the day, can easily prevent these injuries."

Despite the known risk factors and preventable nature of heat injuries among athletes, the majority of the exertional heat-related injuries in this study occurred during sports or exercise (75 percent) or while participating in outdoor recreational activities (4 percent) such as swimming at the beach and playing on the playground.

Youth and adolescents under the age of 20 were more likely to sustain exertional heat-related injuries during participation in sports and recreation than any other age group. In fact, football was accountable for the greatest proportion of these injuries. Nearly half (48 percent) of all exertional heat-related injuries among boys nineteen years of age or younger were associated with football. Known risk factors for young football players include reduced tolerance to heat, inadequate acclimatization and increased heat production and retention due to their athletic gear and equipment. More than 60 percent of football heat-related injuries in this study occurred during the first few weeks of football season (August) when players are less acclimatized to the playing conditions and often have practices twice a day.

Among adults, golf was a significant contributing factor to exertional heat-related injuries and was in the top five most common activities among both men and women 20 years of age and older. While golf is considered by many to be a relaxing sport, it can be physically demanding and requires prolonged periods of time outside in the sun with limited shade. The number of golf associated exertional heat-related injuries increased with age.

"It is important for anyone playing or coaching sports or recreational activities to follow available guidelines for athletic participation in the heat," said Dr. McKenzie, also a faculty member of The Ohio State University College of Medicine. "There are many signs of heat-related illness including extremely high body temperature, headache, rapid pulse, dizziness, nausea, confusion or even unconsciousness," she added. "Exertional heat-related injuries can be prevented by adapting sports and exercise programs during times of heat and high humidity and making sure participants are drinking enough to replace the fluids lost during the activity."

Preventing exertional heat-related injuries is increasingly important as the rate of these types of injuries is on the rise. During the 10-year study period, the number of exertional heat-related injuries increased 133 percent going from 3,192 injuries in 1997 to 7,452 injuries in 2006.

Overall, heat exhaustion (73 percent) was the most common diagnosis followed by dehydration (19 percent), heat syncope (10 percent), heat cramps (5 percent), heath stress (2 percent) and heat stroke (1 percent). While the majority of patients were treated and released, approximately 10 percent were admitted to the hospital for treatment. Men and boys, and patients 60 years of age and older, were more likely than women and girls, and people under 60 years of age, to be hospitalized for exertional heat-related injuries (11 versus 5 percent and 20 versus 8 percent).

This is the first national study of exertional heat-related injuries treated in U.S. emergency departments among the general population in a national sample. Data for this study were collected from the National Electronic Injury Surveillance System (NEISS), which is operated by the U.S. Consumer Product Safety Commission. The NEISS dataset provides information on consumer product-related and sports and recreation-related injuries treated in hospital emergency departments across the country.

Provided by Nationwide Children's Hospital