Cold water immersion among methods used by foreign militaries to treat heat injuries

Lim Min Zhang

The Singapore Armed Forces (SAF), which is looking into ways to treat its heat injuries, may want to consider adopting methods used by foreign militaries to treat such injuries used by foreign militaries, says an expert.

These include cold water immersion used by the United States, Britain and the Australian armed forces.

Heat injuries in the military have come under the spotlight after the death of full-time national service (NTNS) new- man Kay Lee from heatstroke in April. Although the Ministry of Defence (Mindef) and the Singapore General Hospital (SGH) reported that he died of a heart attack, his family has hired a private investigator to look into the incident.

Heatstroke is a condition that occurs when body core temperature rises above 39 deg C.

Prof Lim, who is assistant dean for research at Nanyang Technological University’s Lee Kong Chian School of Medicine, said the number of heatstroke cases here, as revealed in the panel’s report, is comparable to that of other forces like the United States Defense Force and the US Marines.

The report showed that there were 25 heatstroke cases in the army from April 2012 to March this year, one of which was fatal. Corporal First Class Lee died in April this year.

Prof Lim noted that compared with athletes, soldiers might be more susceptible to heat because they are wearing military clothing and equipment to enhance their performance.

"Training for athletes also tends to be tailored individually, while military training is usually tailored for a group or cohort, he added.

Prof Lee, a member of the SAF’s Heat Injury Prevention Task Force from 2012 to 2015 and the Command Formation Safety Advisory Board from 2012 to 2014, said people who are accustomed to warmer climates might, in fact, be less susceptible to heatstroke. When one is used to the climate, he knows how to dress and pace himself to avoid heat injury, he said.

"However, we heard that highly motivated individuals can sometimes push their bodies beyond limits and need to be closely watched," he added.

A review paper written by Associate Professor Kelvin Chew, director and senior consultant of Ching Sports Medicine Centre at Changi General Hospital, said that to ensure safety in training, a multi-approached approach through “knowledge and ingrained safety awareness” is needed.

A fellow panel member, Associate Professor Marcus Ong, senior consultant at the Department of Emergency Medicine at Singapore General Hospital, said prevention and early recognition are the most important ways to reduce heat injury. In the time a person is suffering heatstroke, damage would have occurred to vital organs like the brain, kidney and liver.

"One risk factor that the SAF should consider is how a compromised immune system can lead to heatstroke," said Prof Lim, who wrote his PhD thesis on this topic. This can be a result of recent illness, being sleep-deprived for a period of time, or having prolonged intense training without sufficient recovery time.

"There has been a growing body of work in the last 10 years to report the link that it is not just heat stress during the activity that causes heat injury, but also a sub-optimal immune system plays a part too," he added.

An arm immobilization cooling system is being implemented by the SAF for heat injury prevention. An external panel suggested that the SAF have more effective rapid cooling methods to treat heat injuries. LIM ZADIL FILE PHOTO

Heatstroke types

1. Classic heatstroke (non-exertional)

This occurs commonly in infants, elderly people and the elderly. It develops over a period of days (usually coinciding with a heatwave) and typically presents with severe vomiting, headache and a deteriorating mental status.

2. Exertional heatstroke

Usually develops rapidly in a young, vigorously exercising individual who has not acclimatized to a hot environment. A dramatic presentation is seen with central nervous system changes ranging from severe headache to seizures to collapse.

CAUSES

- Vigorous exercise
- Dehydration
- Too much direct exposure to the sun

GROUPS AT RISK

- Seniors
- Children
- Athletes
- Outdoor workers

WHAT TO DO

- Call for immediate medical attention
- Move the affected person to the shade or a cooler place
- Cool the person with immersion in cool water or by placing or packs on the neck and groin areas

HELP OTHERS STAY SAFE IN EXTREME HEAT

- Monitor children and elderly for signs of heat-related illnesses
- Encourage friends and neighbours who might be more at risk, especially those who live alone, to stay cool and hydrated
- Monitor people with medical conditions that may make them more at risk to the negative impact of extreme heat
- Some chronic health conditions, like diabetes and kidney disorders, can be made worse by heat exposure.

Sources: US DEPARTMENT OF HEALTH AND HUMAN SERVICES, MINNESOTA DEPARTMENT OF HEALTH, MAYO CLINIC, MSWEB

Taking measures to fight the heat

From B1

Mr Adam Huang, editor-in-chief of ReelSociety magazine, said that organised runs take place at night or early in the morning. "Heat injuries are definitely an issue for runners and those who are not used to the temperature." He added that the heat in Singapore is such that one can feel the difference even if they are just wearing a light jacket.

Measures are also in place to protect construction workers from the sun.

Said Mr Kenneth Loo, president of the Construction Contractors Association: "When it’s very hot, we do have water points. We also have a phase of acclimatisation training for workers to be able to work in certain geographical areas where the weather is hot in Singapore.”

Associate Professor Fabian Lim, assistant dean for research at Nanyang Technological University’s Lee Kong Chian School of Medicine, said that the SAF’s heatwave plans have been going through studies on heat for more than 20 years, explained that there are two types of heatwaves: the cold and hot waves, which affect the population in Singapore and cause problems when physical activity is involved.

"A heatwave has killed more than 100 in Japan last month, after a heatwave sweep through the country, reaching temperatures as high as 43 deg C. "When it’s very hot, workers have to work in the heat for longer, and the ambient temperature has increased by five degrees with the deg C of the temperature," said Prof Lim. "Although people are used to the weather, we’re not used to it being hotter here, we have not experienced it before."

He added that countries with heatwaves see extreme temperatures above 40 deg C, while Singapore’s temperature continues to hover around 33 deg C. As a result, he added, people are not as used to the heat as people in hot countries are.

"When body temperature goes up, it affects their physical conditions on their physiology, which worsens the chronic diseases that people already have," he said.

The elderly might also not be able to move to an air-conditioned place, which leads to them dying from heatstroke even indoors. "For Singapore, there is less public health concern in this area," Prof Lim said.

"Many of our houses and public buildings also do not have air-conditioning, so much so that those in Singapore are not used to it."

But Prof Lim said the general public should be taking precautions like not exercising in very hot conditions. They should avoid high-intensity physical activity gradually, by training gradually to reach their general health because heat does not affect a person who has not been trained in a controlled environment.

"The core thought is that prolonged sleep deprivation puts one at risk. They should be able to recover and have enough recovery sleep to suppress the heat-induced physical response. Have regular and healthy meals," he advised.