



AAC Publications

Carbon Monoxide Poisoning

Alaska, Denali National Park, Denali, West Buttress Route

On the evening of June 6, NPS rangers were alerted about a climber who was unresponsive and experiencing seizures in 14,200-foot camp. This 40-year-old male had been pulled from his tent when his climbing partner found him experiencing seizures while cooking in their tent during a storm. The responding mountaineering ranger and his team found the patient was initially responsive only to painful stimuli, but after 30 minutes of oxygen therapy he had returned to normal mental status.

Both this patient and his climbing partner, a 44-year-old male, were found to be suffering from carbon monoxide (CO) poisoning. The partner had exited their tent when “feeling off” and thus was able to alert others that his partner had become unresponsive.

Both of these patients required constant treatment and monitoring until the weather cleared two days later. At this time, both climbers were flown to town and taken to the hospital for further testing and treatment for acute and chronic CO poisoning. During their stay in the NPS medical tent, the patients received alternating treatment with supplemental oxygen and hyperbaric therapy in the Portable Altitude Chamber in hopes of expediting the removal of CO from their red blood cells.

ANALYSIS

Carbon monoxide poisoning is a life threat for mountaineers, especially when weather conditions force climbers to seek shelter while cooking. The outcome of this incident could have been catastrophic had one of the climbers not responded to his “unwell feeling” by exiting the tent for fresh air. The changes to a patient exposed to carbon monoxide can be subtle and often unrecognized by those exposed, as initially the signs and symptoms may mimic the effects of altitude or general unwellness. Adequate ventilation should always be the priority when cooking in an enclosed space such as a tent. (Source: Denali Mountaineering Rangers.)

Images

DEALING WITH A DEADLY GAS

Carbon monoxide (CO) is a colorless and odorless gas that is produced after any fossil fuel is burned. Inside a tent or snow cave, especially one that has little to no ventilation, a dangerous buildup of the gas may result in poisoning or death. There have been at least three incidents of CO poisoning on Denali: two non-fatal incidents in 1985 and 2018, and one fatal incident in 1988.

The most common signs and symptoms of CO poisoning are headache, dizziness, weakness, upset stomach, vomiting, chest pain, and confusion. While easily recognizable, these signs and symptoms are similar to those of acute mountain sickness (AMS), and so the cause may not be immediately identified. Severe CO poisoning signs and symptoms are almost identical to high altitude cerebral and pulmonary edema (HACE, HAPE), with progressive confusion, ataxia, loss of consciousness (HACE), hypoxia, and shortness of breath (HAPE).

To avoid poisoning, attempt to cook outside or in a well-ventilated area such as a tent vestibule; if forced to cook inside, make sure there is plenty of ventilation. While cooking, keep your stove highly pressurized, avoid prolonged simmering, keep the flame blue (yellow flames tend to create more CO), use small diameter pans, and use white, pure fuels if possible. Carbon monoxide builds up more easily in low wind conditions.

If you begin to have the above signs and symptoms while cooking, immediately exit the tent. And if you or your climbing partner are concerned about CO buildup in your tent, just remember, "If in doubt, air it out!"

If available, supplemental oxygen will rapidly reverse symptoms of CO poisoning.

– R. Bryan Simon

Article Details

Author	Denali Mountaineering Rangers
Publication	ANAM
Volume	11
Issue	72
Page	32
Copyright Date	2019
Article Type	Accident reports