Sudden Death After Immersion In Cold Water

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Abstract

Deaths after drowning are usually a complex situation facing a forensic pathologist. However some findings during examination of the body and autopsy can suggest drowning as cause of death, there is no pathognomonic finding to verify this diagnosis. Bodies recovered from cold water sometimes have no important findings in a forensic survey. If a body recovered from cold water had no significant finding on autopsy such as traumatic events nor large volume of water in stomach and pulmonary edema, and toxicological analysis were negative too, we can spot the cardiac arrest following dysrhythmia as the cause of death.

Case Presentation

A 27-year-old man was wade into a domestic swimming pool filled of cold water after betting with his friends. He was an expert swimmer and he had no history of previous mental or medical problems. His friends described he had been fallen into the water and then quickly submerged. Prior to calling for assistance, they removed the body from water and slapped him, but didn’t perform chest compression. Water and ambient temperatures were 5°C and 11°C in death scene investigation respectively. There was no sign of trauma on the corpse’s body. Cutis anserina was seen on the body and face. There was no gross pathologic finding at autopsy. Histologic evaluation was normal and toxicology analysis was negative.

Discussion

Deaths after drowning are usually a complex situation facing a forensic pathologist. However some findings during examination of the body and autopsy can suggest drowning as cause of death, there is no pathognomonic finding to verify this diagnosis. Bodies recovered from cold water usually have no important findings in a forensic survey. Sudden immersion in cold water can stimulate cardiorespiratory reflexes. These reflexes continuing about 2 to 3 minutes (1,2). Sympathetic activation is the first resource of cardiovascular stimulation. Peripheral vasoconstriction, tachycardia, and increased cardiac output are main presenting signs (3,4,5). Catecholamine release and increase heart workload result in dysrhythmias, particularly in older victims with previous coronary artery disease (6, 7). Sudden immersion in cold water also causes a rapid decrease in skin temperature. Following stimulation of peripheral cold receptors, respiratory drive directly stimulates through afferent neurons (2,3). Afterwards gasping occurs that in a little while supersedes by ungovernable hyperventilation (5,7). Falling arterial CO2 tension as a result of hyperventilation makes the victim prone to dysrhythmia as well (2). Maximum response is seen in water about 10°C and can be more severe if the victim is bare (8). Further reducing the temperature from 10°C to 0°C does not increase the intensity of the response (9). In our case, Cardiopulmonary resuscitation on the body recovered from cold water was not performed immediately. No significant findings on autopsy such as traumatic events or large volume of water in stomach and pulmonary edema were seen. Toxicological analysis was negative too. His death was attributed to cardiac arrest due to sudden immersion in cold water.

References

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