

ENVIRONMENTAL FACTORS INVOLVED IN VIOLENT DEATHS IN BIHOR COUNTY

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Abstract

The complexity of human activity and environmental factors, predispose to violent interactions that lead to death, in some cases. Environmental factors involved in deaths can be classified into biological agents, of which are particularly animals (mammals, insects), physical factors such as electricity, natural and extreme temperature variations and elements of the environment such as the accumulation of natural water, or artificial land subsidence. Other factors, although an area known for hazards such as ionizing radiation, they have not been involved in the documented deaths. In the current forensic practice, there are many cases in which deaths are caused by natural factors. The most frequently is involved drowning in fresh water because in this region it is no natural reservoirs of salt water. Cases of drowning are most common accidents, followed by suicides; murders could not be proved through drowning. Domestic animals were the most often involved in the deaths of people, deaths cause by wildlife animal were rare.

Key words: Violent death, biological agents, natural electricity, ionizing radiation, drowning.

INTRODUCTION

Biological agents represented by mammals, reptiles and insects are involved through different mechanisms in death. Large animals like horse can cause death by hoof blow to vital organs such as the cephalic extremity, chest or abdominal cavity. Large animals such as deer can produce fatal wounds with horns. Domestic goats were suspected in a case of blowing and falling, followed by death of the victim. In an isolated case, shepherd was asphyxiated by a flock of sheep through thoracic-abdominal compression. (Eckert, 2011), (Siebenga, 2006)

Insects such as wasps can cause death by sting, followed by anaphylactic shock. Venom is composed of mediatina, histamine, which causes pain and itching. The venom contains peptides, non-enzymatic proteins, apanina, melitinis and kinins, enzyme phospholipase A and B, hyaluronidase. These compounds have complex effects, hemolytic histamines, neuro and nephrotoxicity. (Brasher, 1974)

Death may occur if a sensitive area is sting and if the victim has predisposition to anaphylactic shock, the victim can die due to obstruction

of the upper air way. If overdosage with venom, death occurs through neuritis, hemoglobinuria, the blood low coagulability. Those with atopy, stasis occurs through vessels generalized dilatation, with generalized hypotension, collapse, urticaria, dyspnea and central cardiac and respiratory failure. (Timperman, 1968)

Among the physical factors registered as a cause of death, include natural electricity, occurring under the present clouds of type cumulonimbus, cumulus and stratocumulus with low altitude that discharge static electricity, accumulated to conductive object, located at ground level through a channel formed in the atmosphere (lightning) by air ionization particles loaded with water. (Browne, 1992)

Charged electric cloud is formed by two regions, one superior with positive charges, where low temperatures are between -10 to -15 Celsius degrees, water droplets turning into ice crystals, and the lower one is made of particles of water and is negatively charged. It is formed between clouds and ground voltage measuring tens of millions of volts. Lightning is the average length of 1-2 km, it has a zigzag shape and are of 2 types: negative lightning and positive lightning. (Oliver, 2009)

Dry human skin has a high resistance to electricity, 50 000 ohms, but when the skin is wetted, resistance is reduced 100 times. In addition, the presence of jewelry or other metal objects in the body, increasing the chances of attracting electrical discharge. (Fontanarosa, 1993)

Temperature variations can be positive or negative. The human body has many mechanisms of temperature regulation, including blood circulation, which takes the temperature of the organ with intense metabolism, like liver, where the temperature is high and moving towards the periphery, where the temperature is low, due to close contact with environment, for example skin. They are presented by the skin sweat glands, which secrete substance rich in water, which passes from liquid to gaseous, take the heat of the skin, thus losing body heat. About 500 ml of sweat is produced daily. Air currents move on the surface of the skin in a continuous flow, thus taking heat and dissipating it into the environment. (Popovic, 1965)

Another way of heat loss is through infrared radiation, which is permanently eliminated in the environment when the ambient temperature is lower compared to that of the body. Conduction is the method of heat loss through contact with objects cooler than body temperature.

In normal human body temperature is kept around 37 Celsius degrees. Death by hyperthermia occurs when the temperature of 41 Celsius degrees is exceeded by heat shock. Hyperthermia deaths are rarely found in this geographic area, highs hovering around 40 degrees Celsius, not being reported deaths due to hyperthermia. (Toma, 2013)

Negative variations are more common in winter months as temperatures often reach -10 - 15 degrees Celsius, and is often involved excessive drinking that interferes with adaptive mechanisms by reducing cold shivering and producing hypoglycemia. Compensation mechanisms are maintained until the temperature of 32 degrees Celsius, below this temperature, reflexes disappear, and at 27 degrees, they are completely abolished. Ventricular fibrillation has been reported in 28 to 29 degrees Celsius. At a temperature of 11 degrees Celsius heart rate reaches 4 beats per minute. The most exposed categories of persons are the elderly and homeless. (Weyman, 1974)

Ionizing radiation, produce death either by acute syndromes or by chronic effects. Among acute syndromes include hematologic syndrome, digestive syndrome and nervous syndrome. The less severe hematological syndrome which occurs at low doses of ionizing radiation and is manifested by inhibiting growing up of the elements of the blood by affecting stem cells from bone marrow. It is manifested by varying degrees of anemia and leucopenia are most often fatal within months by compromising the immune system and oxygen transport. (Herzog, 1998)

Digestive syndrome occurs in more high radiation dose than the previous. The digestive system is susceptible to the effects of ionizing radiation due to high turn-over of cells in the digestive tract. Stem cells at this level is in a state of division, in large numbers the lethal mutations that predispose them to being known as the state of division cells are most likely to mutate. The syndrome is manifested by ulcers over the entire digestive tract. This syndrome is fatal within weeks. Nervous syndrome occurs in very high doses of radiation. The nervous system is relatively well protected against ionizing radiation because it have a low mitosis rate. (Beliş, 1995), (Quastler, 1956)

Death by drowning in rivers and dams reservoirs, and other types of water accumulation, are the most frequent deaths caused by environmental factors. Drowning has several phases, the first phase is voluntary apnea, which can take up to 1 minute, followed by a phase when the victim inhale involuntarily, leading to run a higher quantity of water in airways, followed by a strong cough reflex, followed by involuntary movements subsequent aspiration of fluid. The victim loses consciousness and shows generalized convulsion. (Hürlimann, 2000)

Death occurs by passing fresh water with low osmolarity pressure from the alveolar space into bloodstream with haemolysis of red blood cells, accompanied by anoxic phenomena. (Neidhart, 1967)

Ground subsidence sides occur only in human activities, for example, digging of trenches, construction of buildings. (Alexander, 2005), (Aleotti, 1999)

CASES REPORT

Case 1: a person is found dead in a barn without visible injuries of violence. Internal examination was found a fracture with clogging at the cephalic extremity which reproduces the shape of a horse's hoof, subdural hemorrhage and brain dilacerations. Death, most likely, occurred through central cardio-respiratory failure due to strong trauma on the brain.

Case 2: A person found dead in a ravine, in a pasture, presented at the internal examination of the chest, contusion and multiple rib fractures with vital reaction. Death was explained by a possible blow of victim by a goat, followed by fall and rolling, ended by death of the victim. Other possible explanation could be a criminal act. (Perju-Dumbravă, 2015)

Case 3. A shepherd is found dead in a naturally formed pit, in a remote area, covered by several dead sheep, in an advanced state of decay. Death was explained through thoraco-abdominal compression by the weight of sheep.

Case 4. A person with a history of cardiac pathology, moving in an orchard to pick cherries, was stung by three wasps, after his own statements. It is called the ambulance, but the victim dies on the way to hospital. On external examination of the body, we see three areas with 10 cm diameter, possibly hemorrhagic edema associated with insect stings. Death may be favored by preexisting cardiac pathology associated with acute inflammatory syndrome caused by venom.

Case 5. Homeless person is found dead in a disused building, during the winter months, in which, in nights, the temperature reached 10 Celsius degrees below, with many bottles of rubbing alcohol around. At internal examination was observed in the stomach, stains Vivnieski, regarded as a sign of death by hypothermia. The homeless are most susceptible to death by hypothermia, in the absence of heat sources, appropriate apparel, adequate food and alcohol consumption.

Case 6. Elderly person returns to a social event, where he consumed alcohol. On the home way, the victim fell into a moat and was found 2nd morning. At the internal examination, Vivnieski stains were observed in the stomach lining. The toxicological examination revealed a blood alcohol level about 2 grams per thousand. In this case, alcohol favored hypothermia by preventing inducing thermogenesis and deep sleep in an inappropriate place (ditch).

Case 7. Three people are drunk, moving by car, hitting a foothold and fall into the river. 2 people manage to escape, and the 3rd person on the back seat, remains stuck in the car and dies. On examination of the body, we see signs of mechanical asphyxia by drowning in freshwater.

Case 8. A person is found dead into a high speed water flowing canal, with multiple soft tissue injuries and multiple fractures. Internal examination

shows the absence of vital reaction at the level outbreaks fracture and the wounds, but lungs show signs of mechanical asphyxia by drowning. Fractures and wounds were explained by the strong current of water, that struck the victim of various hard objects under the water, during travel.

Case 9. The person in the household, trying to clean the barrel of cabbage, head falls down and dies. Internal examination show signs of asphyxia in saltwater. Drowning in salt water is extremely rare in this region, because of the absence of natural accumulations of salt water. Household accidents of its kind, target older individuals with preexisting pathology of the musculoskeletal system (osteoporosis, spondylitis, muscle atrophy) and children.

Case 10. The person working on installation of pipes, is surprised by the collapse of land bank. Internal examination, observed fractures vault and skull base, extra and subdural hemorrhage.

CONCLUSIONS

1. Environmental factors are involved in violent deaths at a rate of less than 10% of all deaths in Bihor County by violence causes.
2. Death by biological agents, has always atypical pattern and the mechanisms of death are complex.
3. Death by lightning is a rarity, being one case reported in the last 2 years in the Bihor county.
4. The drowning is the most common cause of death from environmental factors, be it accident or suicide.
5. Hypothermia occurs in the winter months and it is an exclusion diagnosis in the absence of other obvious causes of death.
6. Natural land subsidence were not involved in any death in Bihor county, only artificial works have been reported as causes of death. The mechanism of this kind of death is thoraco-abdominal compression or crushing the human body.
7. Human interaction with the environment, in the absence of use of means of protection and safety measures, may lead to violent deaths.

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