

Eduard David, Andreas Fretz and Jörg Reissenweber
ZEPU GmbH, Zentrum für Elektropathologie und Umweltmedizin, Witten, Germany

Taser and Health Risk

Abstract

Since the 19th century electric stimulation is a common mean to influence various body functions. Recently it is used as a non-lethal weapon by law-enforcement personnel to restrain individuals, in order to irritate their muscles using a device of high current electricity (Taser®, Thomas A. Swift's Electric Rifle). However, other organs will also become influenced through electric stimulation, especially when they have electric excitative membrane structures (sodium, potassium and calcium channels), what can cause health risks to the person.

Accomplishing physiological measurements of the most relevant vegetative parameters permits to analyse the interference of electric stimulation. Stress-related increase of blood pressure is characterised by a simultaneous increase of heart frequency and pulse wave velocity. On the other side, during a circulatory collapse, the sharp decrease of blood pressure is associated with an increase in heart frequency.

High-grade stress is often associated with low skin temperature and cold sweat due to a decrease of the electrical resistance of the skin (humid skin has a lower electric resistance than dry skin).

Changes of breath frequency can be due to the paralysis of the breath-controlling musculature and may reflect the disturbance of the responsiveness of the sensible vagus nerves of the lungs. The vagus-sympathicus equilibrium can be derived from the ratio of the vagus-relevant change or breath frequency and the sypathicus-relevant change of heart frequency.

Generally, primary measurement data and so called secondary combination data can let one know something more about the health status. Thus, from the differences of the activity of the musculature of abdomen and chest one can conclude to possible asthmatic reactions, when air is pressed through the constricted wind-pipe by the abdome musculature. Likewise the distribution pattern of the brain activity can give information if the person is in a state of perception or in phase of intentional activity.

Summarized, with the comparison of physiological data it is possible to predict specific types of medical conditions. Furthermore, one can not only prognose direct dangers but also reveal the grade of health risks following the usage of tasers in existing indisposition.