

Modeling of influence of factors of the weapon of not lethal action on the person on the basis of studying a gunshot injury

Khrupkin V.I., Doctor of Medical Sciences, professor

Selivanov V.V., Doctor of Technical Sciences, professor

Savostianov V.V., Doctor of Medical Sciences

Executed theoretical and experimental researches in area of wound ballistics have allowed to elaborate a medical multifunction hardware-software complex, intended to determine the degree of gravity of gunshot injury and dynamic diagnosis of the biological objects state.

Usage of a complex in studies of a pathogens of a modern gunshot injury has allowed to work out yardsticks of an estimation of hitting efficiency of modern rifle weapons, having linked among themselves quantitative characteristics of the marked damage with a qualitative conditional diagnosis of biological object.

The obtained outcomes of experimental researches have demonstrated, that the mechanism of damage of tissues at fire wounds has very composite nature and includes not only direct action injuring projectile, but also initiation of a number of physical phenomena leading to high-gravity hydrodynamic impact on heart and large veins, and also to considerable damages of tissues on the distance from wound channel with occurrence of free radicals initiating the pathological stage, influencing on development of a traumatic shock.

There was established, that strict phase reacting of a biological organism on a mechanical trauma marked by a different ammunition, has standard nature showing in successive stages of changes in a system of blood circulation, bound with developing paresis of vessels hemocirculatory channel.

The definition of pathogenetic mechanism of a modern gunshot injury has allowed to elaborate the medical equipment for immediate monitoring diagnosis of the state of basic vital functions of a system of blood circulation of the wounded person for determining pot-life of injured tissues indispensable for qualitative fulfillment of antishock measures and intraoperational of scoping of a primary surgical treatment at forward stages of a medical evacuation.

Being elaborated for diagnosis of states pertaining to shock, the module of an intensive therapy has allowed to calculate values of productive activity of the left-hand and dextral ventricles of heart, value of a general peripheric resistance of vessels of large and small circles of blood circulation, and also dynamics of change of quadrant of an exocellular liquid, and the

relative value of quadrant of a vascular liquid authentically characterizes a volume of a hemorrhage. All the above was based on using the invasively obtained parameters of values of arterial pressure and pulse rate. The dynamic monitoring of these parameters immediately describes a condition of an injured man and efficiency of antishock measures in real-time mode.

Key words: wound ballistics, gunshot injury, the weapon of not lethal action.