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ABOUT WEAPONS OF MASS DESTRUCTION

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Abstract
Weapons of mass destruction (WMD) are weapons of massive damage, which are used for mass destruction and destruction. Weapons based on nuclear, chemical, biological and new physical principles (light-emitting lasers, radiofrequency, infrasound, radiological, geophysical) are included in the WMD.
A nuclear weapon is a weapon of explosive mass destruction based on the use of the internal energy of the nucleus. This energy is released by fissioning some of the heavy nuclei of uranium and plutonium in a chain reaction.

Keywords
A nuclear weapon, missile, aviation, artillery, mines, army, explosion, shock wave, light radiation, transmissive radiation, light disease.

INTRODUCTION

American theoretical physicist J.R. Oppenheimer, professor of the University of California, is mentioned as the creator of a nuclear weapon, but in 1939, German physicists O. Hahn and F. The Schriesmanns started work, but due to the situation in Germany, they could not complete the plan[1,2].

For the first time, a nuclear weapon was used on August 7, 1945, when a US V-29 bomber dropped an atomic bomb called "Malish" on the Japanese city of Hiroshima. A few days later, on August 9, 1945, the second atomic bomb named "Tolstyak" was dropped on the city of Nagasaki. As a result, the total number of dead, wounded and injured people exceeded 500,000.

A nuclear weapon can be in the form of various explosives: a torpedo and missile warhead, an aviation bomb, an artillery shell, mines, etc.

Nuclear explosives are used in rockets, aviation, artillery and mines. The main means of delivering a nuclear weapon to a target is a missile[3,4,5].

Foreign armies have operational-tactical and strategic missiles; operational tactical missile range is 500-1800 km, strategic missile range is 4000-15000 km. There are also intercontinental ballistic missiles (ICBMs) with a range of 13,000 km.

In foreign armies, until now, airplanes have been a means of delivering nuclear explosives to targets. The flight distance of these planes is 15,000 km. Aviation weapons include nuclear and thermonuclear bombs with a capacity of up to 1000 tons. Foreign armies have howitzers with nuclear and neutron explosives in their artillery. Their flight distance is 29 km. In addition, some foreign armies have nuclear mines designed to blow up large bridges, reservoir dams, tunnels and other structures[6,7,8].

The destructive power of a nuclear explosion depends on the type of explosion and its power. Depending on the mission, a nuclear weapon can be detonated in the air, on the ground, under the ground, on water, under water, in space, in the stratosphere.

Damage factors of nuclear weapons include:

- blast or shock wave;
- light radiation;
- penetrating radiation, contamination of places with radioactive substances;
- electromagnetic pulse.

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The explosion (shock) wave consists of a zone of compressed air of very high pressure, which spreads from the center of the explosion in all directions at a speed greater than the speed of sound. The shock wave will travel the first 1000 meters in 2 seconds, 2000 meters in 5 seconds, and 3000 meters in 8 seconds, during which time people can hide when they see the light beam in the sky and avoid the damage of the shock wave[9,10,11,12].

The shock wave is the main damaging factor during a nuclear explosion and accounts for about 50% of the total energy of the explosion.

The shock wave damages personnel, military equipment, weapons, fortifications, military property and causes a lot of destruction. Personnel can be damaged directly or indirectly by the shock wave, i.e. objects falling from buildings, trees breaking or falling, etc.

The main cause of injury is a sudden increase in air pressure under the influence of a shock wave, which causes various mechanical injuries to a person: rupture of vessels and tissues, broken bones, tearing of the eardrum, etc[13,14,15,16].

To avoid the shock wave, various shelters, trenches, trenches, pits and other hidden places are used, as they reduce the impact of the shock wave by 3-10 times.

MATERIALS AND METHODS

Radiant radiation consists of a stream of light emitted from a sphere formed by a nuclear explosion, which ultimately emits a large amount of scorching heat energy. About 35% of the total energy of a nuclear explosion falls on light radiation. The propagation of the light beam lasts for 8-15 seconds, this beam propagates only in the right direction. Any barrier that is not transparent will protect against the effects of light radiation[17,18].

The radiation of light spreads over large distances in an instant, melts various objects, burns them, burns the skin of unprotected people and animals to varying degrees, damages the eyes, and causes fires in forests and populated areas.

Transient radiation consists of a stream of invisible and invisible gamma rays and neutrons released in an explosion. 15-20 seconds after a nuclear explosion, a very strong stream of rays spreads, and shelters and structures are used to avoid passing radiation. The higher the density of the protective means, the more it will trap the rays, for example, the top of the shelters built in the field should be covered with soil 112-140 cm thick. Transmitting radiation ionizes the molecules of living tissues, destroys the vital activity of the organism, and can lead to various levels of radiation sickness and death[1,19,20].

Light illness is divided into acute and chronic depending on the severity and duration, mild, severe and severe types according to the duration. Gray (Gr) is taken as the unit of radiation of living tissues. It is accepted to divide the clinical appearance and progression of acute radiation sickness into four stages[21,22]: 1-2 Gr is mild, 2-4 Gr is moderate, 4-6 Gr is severe, and more than 6 Gr is extremely severe. When a person receives an extremely large dose of radiation, a toxemic and cerebral type of acute radiation sickness develops, in which the irradiated person dies after a few hours, sometimes a day. If a person receives radiation at a dose of 20 Gr or more, the intestinal epithelium will be damaged in addition to the blood-forming organs, and the injured will quickly die.

One of the specific aspects of acute light disease is its periodic course. Four periods are distinguished: the initial or primary reaction period of the organism to radiation, the latent period or the period of clinical calmness, the acute period or the period when all the symptoms of the disease appear, the recovery period.

Radioactive fission particles (isotopes) produced by the decay of uranium and plutonium are the most dangerous source of damage. In this, more than 200 isotopes of 35 chemical elements are formed, whose half-life ranges from a few seconds to several decades.

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When a 20-kiloton atomic bomb is detonated in the air, its range of penetrating radiation is as follows: up to 800 meters - 100 percent death; 1.2 km - 75 percent of deaths occur; 2 km – causes light disease of the I-II degree[12,23].

Radioactive contamination of places is produced by a nuclear explosion, which uses about 10% of the energy of a nuclear explosion.

A large amount of radioactive substances produced as a result of a nuclear explosion follows the air flow and spreads tens or hundreds of kilometers away from the center of the explosion. This flow damages residences, water sources, agricultural products and other things.

RESULTS

Electromagnetic pulse and secondary damaging factors. As a result of the explosion of nuclear charges, ionization of the air is observed, due to the high-speed movement of the generated electrons, an electromagnetic field appears. As a result, an electromagnetic charge current is formed. An electromagnetic pulse generated in the atmosphere spreads like lightning and creates a high-voltage current in antennas, cables, power lines and wires[24,25]. The damaging effect of an electromagnetic pulse can be observed at a distance of several kilometers.

The resulting current will trip circuit breakers, damage radios, electrical appliances, etc., and people working with these appliances may be electrocuted.

In order to protect against the generated electromagnetic pulses, it is necessary to shield the devices. All power lines must be double-wired and well insulated.

Secondary damage caused by a nuclear charge is due to the exhaust gases and highly toxic substances released as a result of fires in oil refining and chemical plants. This causes mass burns and poisoning.

Weapons based on new physical principles are expected to pose a major threat in the near-future WMD - these are radiation-emitting radio-wave, radiological and geophysical weapons.

A radiation weapon is a set of equipment (generators) that causes severe damage and is based on the use of electromagnetic energy with precisely directed beams or high-speed concentrated beams.

Lasers - in English means light amplifier as a result of forced radiation, have the appearance of optical generators that radiate electromagnetic energy in the optical range at high power. The damage factor of the laser beam is manifested by the melting and glowing of the object material as a result of heating to a high temperature, the failure of highly sensitive elements, the blindness of the organs of vision, and the symptoms of thermal burns to the human skin layer. In case of fog, rain, snow, smoke and dust in the atmosphere, the effectiveness of the laser light decreases significantly. Therefore, the use of lasers is very effective in destroying intercontinental ballistic missiles and earth satellites in the space environment.

Radio frequency weapons are tools based on inflicting damage with the use of very high frequency or very low frequency electromagnetic radiation. The ultra-high frequency range is between 30 mHz and 300 mHz, with the very low frequency range of less than 100 Hz. The object of damage of this weapon includes body organs and internal systems important for human life (brain, heart, central nervous system, blood circulation, endocrine). In addition, radio frequency rays affect the human psyche, the ability to receive information, hearing, and cause hallucinations.

Infrasound gun - the basis of its application is that infrasound displacements are waves with a frequency of less than 16 Hz. Such shifts affect the central nervous system and digestive organs, causing headaches and pain in the internal organs, disrupting the breathing rhythm. At extremely high and very low power frequencies, symptoms of dizziness, nausea and fainting appear. In addition, infrasound radiation has a psychotropic effect on a person, causing loss of self-control, temptation and fear.

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Radiological weapons are defined as substances that are specially extracted and prepared in the form of powder or solution containing radioactive isotopes that have the ionizing radiation properties of chemical elements when the combat radioactive substances are destroyed. Ionizing radiation affects the living tissues of the body, causes them to decay, causes light sickness in a person or causes local damage to individual organs (eyes, skin coverings). As a result of such an effect, after a certain period of time, a person often loses his work immediately and needs long-term treatment.

Geophysical weapon is a term that is conditionally used in a number of countries, and it is a weapon capable of destroying living and non-living objects of nature by artificially changing the processes taking place on the earth's surface, atmosphere and hydrosphere. Among the methods that have an active influence on geophysical processes are the creation of artificial earthquakes in earthquake-prone areas, the calling of typhoons and hurricanes to the coasts of the sea and oceans, snow drifts, floods, etc. In general, the emergence of geophysical weapons is a new direction, and at the same time, it is a very dangerous direction in terms of the development of weapons of mass destruction and their use.

A chemical weapon is a weapon of mass destruction, consisting of combat poisons, means of their application, and based on the toxic properties of these chemicals. Chemical weapons are used to injure personnel and the local population, to poison places, military equipment and material means.

Poisonous substances are delivered to the destination, primarily by air. Toxic substances are such chemical compounds that exist in the atmosphere in various aggregate states (as vapor, gas, aerosol, liquid droplets) and have the ability to kill people and animals at the place of their fall.

Bacteriological weapons are weapons filled with special biological agents and means of their delivery to the target. They are designed to destroy agricultural creatures, plants, and people. The damaging factor of biological weapons is biological agents, which cause serious illness when they enter the human body.

Pests can be used with forethought to destroy grain and technical fields, and at the same time derail the state's economy.

Biological means-aviation bombs are used with the help of cluster missiles and warheads, injection aviation devices, aerosol generators on the ground. Distribution of insects to the target area is carried out with the help of aviation bombs, special containers. Targeted biological weapons - weapons primarily include missiles, aviation, radio and tele-controlled aerostats.

DISCUSSION AND CONCLUSION

Means of protection against weapons of mass destruction.

Personal protective equipment is divided into filtering and separating gas masks, respirators and skin protective equipment - protective complex clothing, suits, overalls, etc. All this protects the respiratory organs, eyes and skin from exposure to radioactive, toxic substances and biological agents.

All of them are divided into filters and separators according to their protective properties. The protective feature of the filter media is based on the passage of air through protective materials, in which the air is cleaned of radioactive, toxic substances and biological agents. The protective feature of isolation means is aimed at completely separating the human organism from the external environment.

According to their use, all protective equipment is divided into general, special, civilian and industrial equipment.

Collective protective equipment includes specially equipped engineering structures and objects that protect against radioactive, toxic substances and biological agents[26]. These structures are designed to protect people from the effects of nuclear weapons, toxic substances and biological agents, as well as conventional weapons. Collective protective equipment completely protects people from the effects of WMD.

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