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LEGAL AND MEDICAL ASPECTS OF REGULAR FIREARMS US AGE BY LAW ENFORCEMENT AGENCIES IN UKRAINE

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Abstract

Background. Ukraine is one of few European countries where the law on the circulation of weapon is still not adopted. At present usage of firearms in this country is regulated by subordinate legislation. Events of the last years in Ukraine demonstrate extremely rapid growth of quantity of firearms among the civilian population. As a result for the last 5 years the quantity of cases of criminal firearms usage rose sharply. ***The objective.*** For the conductions of forensic examinations to make complex cross-disciplinary researches of elastic bullets of cartridges “Teren-12P”. ***The results.*** The study of the bullets physical properties and microelement structure, digital computer modeling of shock and contact interaction with a target and laboratory researches of products distribution of a shot when firing from various distances in biological and non-biological simulators of flesh, study of the influence of various samples of clothes material on the volume and nature of damages, the morphological nature of skin wounds and of clothes material injuries, weight of a fire wound depending on the speed of bullets and distance of a shot have been made. The perspective directions of further researches of a fire wound for the solution of practical expert tasks are defined. ***Conclusion.*** Forensic medical expert researches on cases of firearms application in Ukraine including the nonlethal action of the one equipped with large-caliber cartridges with elastic bullets are of particular importance not only for investigation of resonant criminal

proceedings, but also have important social and public value connected with material and moral compensation to the victims.

Key words: fire wound, elastic bullet, large-caliber cartridge of nonlethal action, cartridges “Teren-12P”, short-barreled weapon, ammunition of 9x18 mm, guns and pump guns “Fort”.

Background. According to article 92 of the Constitution of Ukraine, legal regulations of property in the state and also bases of national security and ensuring public order are defined by laws of Ukraine [1]. However, Ukraine is one of the few countries in Europe where the law on the circulation of weapon is still not adopted. At present us age of fire arms in our country is regulated only by subordinate legislation, namely – orders and instructions of the Ministry of Internal Affairs (MIA).

Events of the last years in Ukraine which are covered widely by mass media clearly demonstrate extremely rapid growth of quantity of firearms among the civilian population. It in turn predetermines spread of cases of its use during mass riots both from protesters and law enforcement officers, first of all, fighters of Special Forces of the Ministry of Internal Affairs of Ukraine. According to official data of MIA and the Prosecutor General's Office of Ukraine in 2012the number of firearms usage crimes was about 350 cases, 80of which are murders. In 2016 the number of criminal proceedings for firearms usage offenses was already over 3000 cases, 900of which are murders or causing grievous bodily harm and 700 – are assaults. Thus, for the last 5 years the quantity of cases of criminal firearms usage rose sharply, as well as the quantity of the firearms and ammunition withdrawn by law enforcement authorities. Sometimes it estimated in tens and hundreds of units [2].

The priorities on protection of a public order assigned to law-enforcement bodies are carried out both in daily conditions directed to prevent offenses, and at the force-majeure connected with detention of armed criminals, prevention or termination of group disorderly conduct and mass riots in settlements, and mitigation of natural disasters, major production accidents and catastrophes consequences. Besides, important and responsible tasks of ensuring protection of public order at actions of civil defense in peace time and general readiness during martial law are assigned to law-enforcement bodies [3].

In the list of special means which police officers can use when performing their powers in the Law of Ukraine "About National police" devices for firing cartridges equipped with elastic or similar on the properties throwing shells of nonlethal (traumatic) actionare carried. They use idem cartridges according to article 45 for: a) protection against attack,

endangering for life and health of human, including police officer; b) reflections of armed attack on the objects which are under protection, convoys, home accommodations and non-residential premises and also for release them in case of capture; c) detentions of the criminal suspectin felony or capital crime and which tries to run; d) detentions of the person which shows armed resistance or tries to escape from custody; e) detentions of the armed individual which threatens with use of weapons and other objects, endangering for life and health of human, including police officer; f) giving of an alarm signal or call of auxiliary forces; g) terminations of group disorderly conduct or mass riots; g) reflections of group attack, endangering for life and health of human [4].

In articles 42, 43, 45 of the Law of Ukraine "About National police" duties of police officers in cases of coercive measures application by them and also an order, regulations and prohibition of special means applications are accurately regulated, in particular: the police officer is obliged to stop application of a certain type of a coercive measure immediately at the time of achievement of the expected result; police officers are obliged to render emergency medical aid to the persons injured with application of coercive measures; special means application to women with apparentshowings of pregnancy, juvenile persons, physically challenged or an old agedpersonsis forbidden, except cases of the armed or group attack commission or commission of armed resistance by them to the police officer, that threatens life and health of other persons or police officers, if it is impossible to reflect such attack or resistance in other ways and means; the police (police officer) is forbidden to fire the cartridges equipped with elastic or similar on the properties throwing shells of nonlethal (traumatic) action, with violation of the requirements determined by technical characteristics concerning distance from the face and shooting in separate parts of the head and body of the person.

Except the Law of Ukraine "About National police", almost similar service regulations and applications of special means, including devices for shooting of the cartridges equipped with bullets of nonlethal action, are contained also in the laws regulating activity of other law enforcement agencies and military structures, such as Laws of Ukraine "About National guard of Ukraine" (articles 15, 17), "About security service of Ukraine" (article 26), "About prospecting bodies of Ukraine" (article 19), "About the charter of internal service of the Armed Forces of Ukraine" (articles 20, 21, 22, 24), "About fight against terrorism" (article 13), etc.

Regular smooth-bore guns which are armed with by special military divisions and law enforcement agencies of the different countries for a long time have already proved efficiency

of its application depending on conditions and features of set tasks [5, 6, 7]. In comparison with rifle, smooth-bore weapon has the following advantages: shorter time for implementation of an aim shot "offhand", high probability of the target hitting by shell elements of one cartridge, smaller rebounding of the striking elements in the closed spaces and higher safety of firing for the third parties at a distance of aim range. Along with it, bullet cartridges for smooth-bore guns unlike cartridges for rifles have higher barrel energy and also striking and stopping action of a bullet [8].

Since the beginning of the 21st century pump guns of a model range “Fort-500” of domestic manufacturer the Research and Production Company “Fort” of the Ministry of Internal Affairs of Ukraine (Vinnytsia) were received on arms by law enforcement agencies of Ukraine. As the regular large-calibre cartridges of nonlethal action intended for shots from pump guns “Fort-500” and other smooth-bore guns of the 12th caliber the common cartridges certified in Ukraine “Teren-12P” (with an elastic bullet) and “Teren-12P” (with an elastic case-shot) which are made by the Research and Production Enterprise“Ecologist” (Kiev) are used now. During production term cartridges “Teren-12P” were equipped with two types of bullets, of an old model and a new one. After the insignificant term of operation and application of bullets of an old sample was revealed a number of the essential shortcomings connected with their unstable ballistic characteristics. It had rather low grouping and accuracy of firing. During a shot it significantly deformed stabilizer edges that promoted decrease in stability in free flight and variability of provisions of the bullet toward the target at the time of its defeat. In turn it reduced efficiency of action of a bullet on the target. Further a bullet of an old model was replaced with a bullet of a new design, similar to a bullet of Blondo which significantly surpassed the previous model in the characteristics. Thanks to the rational form of a head part and to the design of a new bullet in general, developers reached higher efficiency of its action on the target and stability in flight [9, 10].

In spite of the fact that large-caliber cartridges of nonlethal action for rather long period of time have been in circulation in Ukraine and now continue to be applied by law enforcement authorities and certain citizens, proper attention of forensic medical diagnostics of the caused damages was practically not given by domestic medical experts. It should be noted the work by V. Sukhiy and G. Zaritskiy (2003) in which the experimental study results of distance influence on the nature of the damages of a forward thorax and stomach surface of a dead body, unprotected by clothes, at shots from a pump gun “Fort-500”with cartridges “Teren-12P” of an old model are presented [11]. Bullet speed at distance of 5 m from a corpse was 137 ± 20 m/s, at distance of 20 m – 102 ± 20 m/s. At shots from distance of 5, 10, 15 and

20 m researchers established a complex of characteristic morphological features of damages to a type of grazes of a round form against the background of which sites of intensive deleting of epidermis with formation of an external and internal ring and aria in the center of a graze (display of design features of a bullet's fore-part) are differ; pollution by a soot of grazes surfaces owing to rubdown of a sooty bullet; possible existence of traces in the form of ring-shaped laying of a soot with a diameter of 1,9-2,0 cm caused by a sooty wads; lack of penetration of a bullet into muscles, chest and belly cavities; impossibility of fixing of a bullet in a body; possibilities of formation of the simple ribs fractures, ruptures of muscles and a pleura (at shots from distance to 15 m inclusive). Besides, researchers arrived at the conclusion that the character and weight of injuries of a thorax and stomach depend, first of all, on a shot distance (its increase is followed by reduction of weight of damages), and the distance of 20 m is minimum, from which at shots on a corpse the damages having symptoms of slight injuries.

The objective. For the conductions of forensic examinations to make complex cross-disciplinary researches of elastic bullets of cartridges "Teren-12P".

The results. During 2011-2013 we conducted complex cross-disciplinary researches of elastic bullets of cartridges "Teren-12P" with application of various modern methods including studying of their physical properties and microelement structure, digital computer modeling of shock and contact interaction with a target and also laboratory researches of products distribution of a shot when firing from various distances in biological and not biological simulators of flesh, studying the influence of various samples of clothes material on volume and the nature of damages, the morphological nature of skin wounds and of clothes material injuries, studying of weight of a fire wound depending on the speed of bullets and distance of a shot, etc. [12, 13]. The anticipating approach to a complex research of cartridges"Teren-12P" bullets as possible object of examinations was quite righteous, as the subsequent events in Ukraine caused need of expeditious conducting numerous forensic examinations with situational modeling of circumstances of their mass application. Without results of the beforehand made experimental studies an effective conducting of forensic examinations at the high scientific level would be impossible.

In November, 2013 – February, 2014 during the mass protest actions there were cases of numerous applications of the firearms (devices), including equipped with cartridges of nonlethal action, by certain officials of law enforcement agencies against citizens in Kiev and in other cities of Ukraine. Forensic medical examinations concerning people who were injured during the mass actions of a civil protest in 2013-2014 are carried out and continue to

be carried out in various regional bureaus of forensic medical examination of Ukraine (more than 170 complex and commission examinations were provided in Kharkiv). The conclusions of said forensic medical examinations are not only join by investigators to the materials of criminal proceedings, but also with the permission of the investigator can be used by the interdepartmental commissions, which establish the facts of infliction of harm to health of the person who were injured during participation in Revolution of Advantage and who request for medical care during the period from November 21, 2013 to April 30, 2014, and also direct to medico-social examination for establishment of connection of disability with violation of health [14].

Besides use of other means of coercion, the police officer is authorized to use firearms in exceptional cases [4]:

1) for repelling an attack on the police officer or members of his family, in case of their life or health threat;

2) for protection of persons against the attack threatening their life or health;

3) for release of hostages or persons who were illegally imprisoned;

4) for reflection of attack on the objects which are under protection, convoys, home accommodations and non-residential premises and also for release them in case of capture;

5) for detention of the criminal suspectin felony or capital crime and which tries to run;

6) for detention of the person which shows armed resistance or tries to escape from custody and also armed individual which threatens with use of weapons and other objects, endangering for life and health of human, including police officer;

7) for a vehicle stop by its damage if the driver' actions creates threat for life and health of human, including police officer.

The police officer can use firearms only for the purpose of causing to the person of such harm which is necessary and sufficient in such situation for immediate prevention or the termination of armed attack and if it cannot be reached with other means.

The police officer is forbidden to use firearms in places where harm can be done to other persons and also in flammable and explosive places, except emergency cases.

As a regular short-barreled weapon of divisions of law enforcement agencies of Ukraine were accepted guns of the Ukrainian production (State-Owned Science-Industrial Association "Fort" of the Ministry of Internal Affairs of Ukraine): "Fort-12", "Fort-17" and "Fort-14TP", which are used together with still widespread Makarov pistol (MP) [15].

Besides, since 2014 the “Fort-17” and “Fort-14TP” guns are accepted as regular weapon of Ukrainian Ground Forces [16, 17].

The question of domestic gun development in Ukraine appeared still in the late nineties of the last century. By request of the Ministry of Internal Affairs of Ukrainethe Ukrainian Science Industrial Association "Fort" in Vinnytsia developed the “Fort-12” gun for a cartridge ammunition of 9x18 mm. Mass production of a gun was arranged in 1998 on the Czech machine equipment. In the first modifications the gun had 4 grooves barrel. Since 2002 own production of a 95 cm long barrel gun with 6 right inclined grooves is fully developed. That is one of its distinctive features from MP. "Fort-12" is the self-loading gun of 9 mm caliber intended for defeating the enemy at distance up to 50 m, the destructive power of a bullet remains up to 350 m, the initial speed of flight of a bullet is up to 320 m/s. According to information of the producer, the gun is rather balanced and combines all main qualities of a service pistol: the metal frame providing reliability and durability, capacious magazine (15 cartridges), the reliable system of safety locks with a possibility of a trigger blocking both on fighting and at safety cocking, rather small sizes doing it convenient for constant carrying. In addition the gun can be completed with the device for decrease in level of a sound and a tactical lamp. "Fort-12" differs favorably from MP in the considerably improved ergonomics; heightened accuracy of firing; lower felt return; higher rate of fire; bigger weight and sizes [18].

In general the “Fort-17” gun in its tactical and technical characteristics corresponds to the prototype "Fort-12", however in it a number of details is replaced with analogs from high-strength polymer (a frame, magazine) that significantly facilitates its design (on 150 g) without damage to fighting qualities. This gun is more ergonomic, there are two modifications: usual and for the left-handed shooters. Unlike MP the rate of fire and capacity of magazine are increased init, its weight is reduced despite some increase in the sizes, and also there are 6 right inclined grooves in the barrel channel.

The “Fort-14TP” gun has extended (123 mm) a motionless easily removable barrel there by the initial speed of a bullet (335 m/s) is increased. Its design allows for completing the gun with the device for decrease in level of a sound, a tactical lamp or a laser grip, and also with a magazine of the increased capacity. Regular ammunition is cartridges of caliber of 9x18 mm.

Also the “Fort” guns are issued in decorating (polishing, covering with damask steel, incrustation by precious metals) as an award weapon for the highest officers and also for

famous people. Except the exterior in their tactical and technical characteristics these samples do not differ from a military weapon.

Modern data on features of damages of objects of forensic medical examination from these models of weapon are extremely limited, only some private questions are studied.

Scientific research of a fire wound of the last years in Ukraine is devoted, mainly, to questions of injuries of the body including protected by means of an armored protection, by bullets of a special purpose. Also there are numerous works on studying of damages from so-called "civil" samples of this weapon – the “Fort-12R” gun of 9 mm caliber intended for firing by elastic bullets and the gas gun "Fort-12G" of 9 mm caliber, with application of the noise cartridges and cartridges equipped with irritant. Though these models of weapon are made on the same technological lines and from same the materials as a military weapon, however some details in them are deliberately weakened. Besides, there are essential constructive differences (lack of grooves of the barrels channel and its narrowing) in a gun for firing by elastic bullets, a crosser (a cross metal partition) at the end of a gas guns barrel). These design features of the mentioned “Fort-12R” and “Fort-12G” guns are practically excluding a possibility of shots by regular ammunition for a military weapon without destruction of a design.

Researches of damages from the “Fort-12” gun for requirements of forensic medical examination were for the first time conducted by group of the Kharkiv medical experts (Antoniuk A., Tagayev N., etc.) in 1997 [19]. Authors used for researches modification of the “Fort-12” gun with 4 right inclined grooves and of standard 9-mm MP ammunition, which is laid off now. On the basis of 75 cases it was established that at point-blank range shots there were ruptures of a crosswise form on cotton fabric, and at a distance of 1 cm –they were slit-like, at more long ranges of gaps ruptures were not observed. The soot was postponed at shot distance less than 30 cm, and a powder grains– less than 90-130 cm. Particles of metals were defined at distance up to 100-130 cm. Among features of cotton fabrics damages there were noted the special form of a corbel of rubdown (in the form of an 8-petal figure), which reflected quantity of traceson a bullet sides made by grooves [20]. Further the same authors directed the researches to establishment of firearms models shooting of regular 9x18 mm MP ammunition on the nature of entrance damage from close and remote distances [21]. In this regard authors investigated damages of cotton fabric by MP ammunition of 9x18 mm at shots from the MP, Stechkin automatic pistol (SAP); "Fort-12" (in modification of 4 and 6 right inclined grooves barrels). Within a close distance estimated explosive effect of powder gases, distances of adjournment of a soot and powder grains. Ruptures of damage edges by shots

from MP and "Fort-12" gun were noted at distances to 1 cm, and from the SAP up to 20 cm. At point-blank range shots all models formed crosswise gaps from 6 cm to 14 cm long. At distance of 1 cm shots from "Fort-12"gun caused linear gaps from 1 cm to 4,6 cm long. The soot in a zone of damages at shots from MP and SAP was observed at distance up to 40 – 45 cm, and from "Fort-12" up to 30 – 35cm. The expressiveness of the central area of a soot in MP and "Fort-12" was noted to 10 cm, in the SAP– upto 20 cm. At shots from MP and "Fort-12" from distance of 5 cm the special form of the central area of soot drew attention in certain cases. In damages from MP it had the crosswise form, and in damages from "Fort-12" – six-petal that, according to authors, reflected quantity of grooves of the barrels channel in this distance. Powder grains at shots from MP met at distances up to 160 cm, fromSAP– up to 140 cm, from "Fort-12" – up to 150 cm. At all distances of detection of a soot and powder grains the relative intensity of adjournment of soot was more at shots from the SAP, and powder grains – from MP and "Fort-12". It is explained by the bigger length of a barrel at the SAP in comparison with MP and "Fort-12".

Authors carried out studying of damages from a remote distance (from 1 m to 25 m with intervals on 5 m) visually, including by means of MBS-10 microscope, photographed and scanned (in the mode with the resolution of 600 dpi), with the subsequent studying in the graphic editor [22]. The analysis of material allowed revealing some features in formation and character of a belt of rubdown. The external contour had an appearance of a four-petal figure at shots from 4 cut models (more often from the SAP) or a six-sided polygon at shots from "Fort-12" (6 grooves). Regarding cases the external contour of rubdown corbel had an appearance of alternation of ledges and deepening, at the same time color of ledges was more saturated. In 4 cut models the quantity of ledges corresponded to the 8, and at shots from "Fort-12" (6 grooves) – to 12. In certain cases ledges of an external contour almost merged, creating 4-petal contour (the SAP, MP, "Fort-12" – 4 grooves) or a hexagon ("Fort-12" – 6 grooves). In some cases corbels of rubdown had rather equal external contour, but on their general background there were more saturated strips – on the 8in "Fort-12" (4 grooves), 12 – in "Fort-12" (6 grooves). Researchers explain such non-uniform structure of rubdown corbels by the fact that soot on a bullet at shots is postponed mainly on the sites corresponding to grooves at their sides. Proceeding from it, the sectors limited to two more intensive strips were measured, results of measurements showed a possibility of definition on features of rubdown corbels, width of traces from grooves on a bullet of 9x18 MP ammunition with an accuracy of 0,08 mm.

Therefore, when studying a number of features of a shot products action (existence of fabrics ruptures, their form, sizes, features of adjournment of a soot and powder grains), it is possible to establish shot distance, and weapon model in certain cases. Ata research of features of rubdown corbels, such as form of an external contour and non-uniformity of a soot distribution in it, it's possible to define the quantity of grooves on a bullet and, in some cases, their dimensional characteristics, i.e. to define model of weapon a bullet was shot from or to exclude its use.

Our researches studied some aspects of diagnostics of the damages caused from modern guns of a model range "Fort". Features of influence of guns design characteristics on the nature of damages of human clothes simulators and overlapping of products of a shot were considered. Differential diagnostics of prints of barrel cuts ("recoil injury") at point-blank range shots from different models of the "Fort" guns was carried out and the possibility of definition of concrete model was considered. Features of influence of clothes material structure and of its layers quantity on the nature of damages and topography of adjournment of shot products were investigated. Features of multilayered barriers damage, including woven and nonwoven fabrics, were also investigated. Questions of diagnostics of a shot distance, taking into account information about morphological features of fire damages and the range of distribution of a shot products (powder gases, a soot, powder grains, metals) were studied [23; 24, 25]. Also features of damages formation of biological fabrics simulators (a human body) from positions of wound ballistics were investigated [26].

Thus, establishment of diagnostic criteria of weapon model definition, fire shell and a shot distance in conducting expert researches in forensic medical expert institutions of Ukraine at the shots from weapon of a model range "Fort" equipped with regular ammunition will be provided with carrying out a complex of experimental studies with determination of parameters of wound ballistics and processing of the received results with use of mathematical statistics methods.

Conclusion. Forensic medical expert researches on cases of application firearms in Ukraine including the nonlethal action one equipped with large-caliber cartridges with elastic bullets are of particular importance not only for investigation of resonant criminal proceedings, but also have the important social and public value connected with material and moral compensation of damage to victims.

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