



CASE REPORT / ПРИКАЗ БОЛЕСНИКА

Suicide in a shooting range – a review of two autopsy cases

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SUMMARY

Introduction Shooting ranges are places designated for firearm shooting practice. Regulations outline the technical and structural requirements, that should ensure the safety of individuals inside the shooting range. Rules also dictate the keeping of user records and firearm-issuance records. However, mandatory medical examinations for shooting-range users are not required, but they are obligatory for obtaining permits for firearm possession and storage.

Outlines of cases We describe two cases of suicide in a shooting range. The individuals were men, whose autopsies were performed at the Institute of Pathology and Forensic Medicine of the Military Medical Academy. In both cases, the cause of death was the destruction of vital brain centers along the trajectory of the gunshot wound.

Conclusion These cases raise the question of whether shooting ranges are truly safe places for training and practice. While technical and structural requirements may be fully met, the health status of individuals who come to these facilities for shooting practice is inadequately monitored.

Keywords: shooting range; firearm; suicide; permit; medical examination

INTRODUCTION

Shooting ranges are intended for the safe handling of firearms, firing a weapon along a single trajectory from a fixed position [1]. A safe person is one who is competent in handling firearms and ammunition, demonstrating that ability at all times [2]. However, suicides do occur in shooting ranges, though reports on such cases are rare. These incidents are revealed during forensic autopsies, making it crucial for forensic pathologists to highlight cases of suicide in shooting ranges and identify possible oversights leading to these incidents. Firearm-training regulations in Serbia are prescribed by the Law on Weapons and Ammunition of the Republic of Serbia (LWARS) and the Rulebook on Firearm Handling Training [3, 4].

So why do suicides still happen in shooting ranges? The execution of suicide requires a motivation to attempt suicide and suicidal disposition. Suicidal stimulants, most commonly alcohol, facilitate the act. Easy access to firearms, combined with these factors, further facilitates the method of suicide. The core issue lies in inadequate monitoring of the health and psychological state of shooting-range users.

The objective of this review is to highlight that shooting ranges are not completely safe places. Suicides do occur in shooting ranges. It is necessary to assess the health condition, primarily the mental state, of individuals who have access to firearms in shooting ranges in order to prevent undesirable events.

REPORTS OF CASES

We describe two cases of suicide that occurred in two different shooting ranges in Belgrade, Serbia. The suicides occurred in the presence of multiple people who were at the shooting range at the time. Both individuals were male and right-handed. In one case, the potential motivation was an unfinished university degree, while the motivation for the second suicide remained unclear.

In the first case, the individual was a 26-year-old man who was not a member of the shooting range. He used the shooting range's services based on a friendship with its employees. He committed suicide one hour and 15 minutes after arriving at the shooting range, using a "CZ 999" pistol, 9 mm caliber, owned by the facility.

In the second case, the individual was a 40-year-old man who was a member of the shooting range and had been attending it regularly for several months. On the day of his suicide, he visited the range in the morning, then returned in the afternoon, committing suicide 15 minutes after his arrival, using a "Magnum Taurus 357" pistol, .357 Mag caliber, owned by the facility. In both cases, the gunshot entrance wound was located in the right temple area, while the exit wound was in the left temple area. The cause of death was the destruction of vital brain centers along the trajectory of the gunshot wound, inflicted by a projectile fired at close range. Toxicological analysis of blood and urine samples taken during autopsy, conducted at the Department of Toxicological Chemistry at

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the Military Medical Academy, did not detect the presence of alcohol. Immunochromatographic (lateral-flow assay) test strips did not reveal the presence of morphine-based opiates, cannabinoids, cocaine, amphetamines, or methamphetamines in the urine samples of either victim. Liquid chromatography with UV spectral detection identified caffeine in the blood and urine samples of the first victim, while paracetamol (0.002 mg/L) was found in the urine sample. No drugs were detected in the samples of the second victim. Gunshot-residue tests on the hands of both examined individuals were positive.

Ethics: The study was approved by the Ethics Committee of the Military Medical Academy (No. 57/2024).

DISCUSSION

The LWARS stipulates that firearm training can be organized by individuals who can provide proof of ownership of shooting ranges, or a lease of this business, possess evidence of the required expertise, and meet the necessary spatial and technical conditions, for safe firearm storage and handling [3]. Technical and construction requirements, such as the width of passageways, rubber strips in front of bullet traps, bulletproof barriers between shooting lanes, evacuation routes, and various other spatial conditions, are outlined in regulations of Serbia and other countries [1, 2, 4]. The risk of poisoning by lead, antimony, and carbon monoxide in shooting ranges is also mitigated through strict control, ventilation, and cleaning protocols [1, 2, 4]. The LWARS states that only adults can obtain a permit to purchase and own firearms. However, the law does not set an age limit for entry into shooting ranges. Some shooting ranges indicate in their presentations that independent use is only permitted for individuals over the age of 18 years [5, 6].

In a retrospective study of forensic autopsies conducted at the Institute of Pathology and Forensic Medicine of the Military Medical Academy from 2010 to 2019, suicides in shooting ranges accounted for 2.25% of all firearm-related suicides. Barber et al. [7] report that shooting range suicides constituted 0.18% of all firearm suicides from 2004 to 2015. Other authors note that most firearm suicides occur in facilities that house both firearm stores and shooting ranges [8]. Due to suicides in shooting ranges in the United States, suicide-prevention measures have been introduced. These measures require that unknown individuals can only visit a shooting range if accompanied by another person, and must provide proof of completed firearm training, or have someone who can confirm their mental competence [7]. Access to firearms increases the risk of suicide in families with a history of suicide cases [9]. It is estimated that stricter government policies on firearm acquisition could reduce firearm-related deaths in the United States by approximately 11% in a single year [10, 11, 12].

Firearm access in shooting ranges is granted to those who hold permits for firearm possession and carrying, as well as to those who do not have such permits. The LWARS establishes the conditions for obtaining firearm possession

and carrying permits [3]. Such permits are issued after an assessment of health eligibility, which is determined according to the Rulebook on Health Eligibility Assessment for Civilians for Firearm Possession and Carrying [13]. A clinical examination, hearing and vision tests, and a psychiatric evaluation are required [13]. This rulebook states that alcoholism and psychoactive substance addiction are contraindications for firearm possession. However, it does not mandate a compulsory test for the presence of psychoactive substances. Instead, testing is conducted based on the indication of an occupational medicine physician or neuropsychiatrist, and requires the patient's written consent [13]. The control of alcohol and psychoactive substance use should be mandatory for all individuals with access to firearms. Lower firearm homicide rates have been recorded in countries where firearm access was restricted following penalties for driving under the influence of alcohol or illegal substances [14]. Legal guidelines for issuing firearm permits in the United Kingdom specify that a firearm license will only be granted after obtaining specific information from a physician, regarding the presence of mental-health disorders, neurological diseases, or substance abuse [15].

Suicidal thoughts and behaviors, physical pain, cognitive impairment, depression, anxiety, and psychotic disorders are among the many factors that may lead to suicide [16–19]. The Rulebook on Health Eligibility Assessment in Serbia lists panic states, phobias, sleep disorders, and mood disorders, among various psychiatric and neurological conditions, that are contraindications for firearm possession [13]. It is evident that these disorders must be diagnosed by a physician following a thorough examination. Serbian law stipulates that the authority issuing firearm possession and carrying permits, must inform the patient's primary care physician about the issuance of the permit [3]. The primary care physician is obligated to notify the competent police department about changes in medical conditions and deteriorations in mental health, discovered during examinations [3, 15]. The LWARS also prescribes financial penalties for physicians who fail to comply with this regulation [3]. An individual who holds a firearm possession permit must submit a new medical certificate upon the expiration of the previous one, meaning every five years [3]. This ensures proper monitoring of firearm owners over a specific period. A shooting-range user without a firearm possession permit has not undergone a medical examination, and does not have proof of health eligibility. This means that shooting ranges allow access to firearms for individuals without medical supervision, increasing the likelihood of both suicides and homicides.

Firearm accessibility always carries the risk of unwanted incidents and requires strict control. Although shooting range suicides are rare, proper selection of individuals with firearm access is necessary. Health-eligibility assessments, with a particular focus on mental health and the use of psychoactive substances, should be mandatory for all shooting-range users. This would reduce the risk of suicides and potential homicides in shooting ranges.

Conflict of interest: None declared.

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Самоубиство у стрељани – приказ два случаја аутопсије

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САЖЕТАК

Увод Стрељане су места намењена за гађање ватреним оружјем. Правилником су прописани техничко-грађевински услови за стрељане који би требало да гарантују безбедност лица унутар стрељане. Прописана су и правила о вођењу евиденције корисника стрељане и издавању оружја. Међутим, нису установљени обавезни лекарски прегледи за кориснике стрељана, иако су они обавезни за издавање дозвола за држање и чување оружја.

Прикази случајева Описујемо два случаја самоубиства у стрељани. У питању су мушкарци чије су обдукције оба-

вљене на Институту за патологију и судску медицину Војномедицинске академије и у оба случаја узрок смрти било је разарење за живот важних можданих центара дуж канала прострелне главе.

Закључак Поставља се питање да ли су и колико стрељане безбедна места за обуку и вежбе гађања. Техничко-грађевински услови су можда потпуно испуњени, али се здравствено стање особа које долазе у стрељану да гађају неадекватно контролише.

Кључне речи: стрељана; ватрено оружје; самоубиство; дозвола; лекарски преглед