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REVIEW

Deaths by firearm and intraoral gunshot: Medicolegal etiology[☆]



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Abstract Investigation of deaths caused by the use of firearms, with their different homicidal, suicidal and accidental etiologies, is part of the medical-forensic expert's regular work. Mouth is usually chosen by the suicide using a gun. However, gunshot rarely occurs – or it is an exception, in homicidal or accidental deaths. In this paper we shall review the different variables which are useful in order to discriminate the different etiologies, such as the scene, the kind of weapon used, the number of injuries sustained and their location, or the direction of the bullet. Also, we shall particularly focus on the types of injuries caused. The way that lips, teeth and tongue are affected is of particular interest in this investigation. For this purpose, we have conducted a research in books and medical articles, including the PubMed, Dialnet and Academic Google bibliographic database.

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PALABRAS CLAVE

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Muertes por arma de fuego y disparo intraoral: etiología medicolegal

Resumen El estudio de las muertes por arma de fuego, en sus distintas etiologías, forma parte de la práctica habitual medicoforense. En aquellas de origen suicida, la boca constituye un lugar preferente para el disparo, de forma contraria a los supuestos homicidas o accidentales. En el presente trabajo se revisan distintas variables de utilidad para la determinación medicoforense de la etiología, con especial referencia a los disparos intraorales. Entre ellas se analizan el lugar del suceso, tipo de arma empleada, el número y localización de las heridas, el trayecto seguido por el proyectil y las lesiones ocasionadas, siendo de especial interés la forma en que resultan afectados los labios, los dientes y la lengua. Para lo cual se ha realizado una búsqueda sistemática, incluyendo las bases de datos bibliográficas PubMed, Dialnet y Google Académico. © 2016 Asociación Nacional de Médicos Forenses. Publicado por Elsevier España, S.L.U. Todos los derechos reservados.

Introduction

Firearm-related deaths constitute a major chapter in forensic medicine. The use of firearms in the settings of homicides, suicides and accidents affords them a special juridical and medical/legal significance. The habitual subjects of forensic examinations include measurements of the distance and direction of shots, wound characteristics or the possible survival of the victims, and as a preliminary and fundamental issue, differentiation between the causes of death by suicide and homicide, which will determine how the investigation develops.

The incidence of deaths of this type is indicative of its significance, although there are marked differences based on several factors, among which the ease of access to this type of weapon stands out, with the result of its prohibition a subject of study.¹

The figures are very different and show the frequent use of firearms in countries where their availability is greater, such as Switzerland² or the United States³; in the US they are involved in 68% of homicides and 51% of suicides. Similarly, in Argentina, they are involved in 28.2% of suicides and up to 70% of homicides.⁴

These figures differ considerably from those obtained in Asian countries. In Japan, where hanging is the preferred method of suicide, the use of firearms is found only in 0.2% of cases, in line with the fact that the population of Asians residing in the United States has the lowest rate of suicide by this method.⁵ Similarly, in Shanghai, China, the use of a firearm is recorded only in 0.5% of homicides and 0.7% of suicides, with hanging and deliberate jumping from heights being the main methods.⁶

With regard to Spain, in the Forensic Pathology Institute of Madrid, which performs the majority of autopsies in the autonomous community, firearms appear to be involved in 5% of suicides, where there is a preference for jumping, and 19% of homicides, where knives are predominately used.⁷ Likewise, a study on suicide in Seville found that firearms only in 7.5% of these deaths, a significantly lower percentage than those for hanging and jumping.⁸

Although the examination of the corpse and the site of the incident generally provide sufficient evidence to

differentiate between suicide and homicide, there are cases where doubt remains, particularly those involving bodies in poor condition or after an insufficient examination during the autopsy, and which may, on occasion, be unsolvable. In these cases, in addition to basic studies—such as gunpowder residue and blood spatter analysis, the study of ridge patterns in prints on the firearm or the search for other signs of violence at the scene and on the body—of particular interest will be the number and location of wounds, the type of firearm used, the site of the event, the distance and the trajectory of the bullet, and the type of injury. This review analyses these latter factors. Although shootings are addressed according to their different causes, this review focuses on firearm-related mouth injuries, with the limitations entailed by frequency of homicides in these cases being low.

Discriminant function analysis of homicides and suicides**Sex and age**

As is the case with violent deaths in general, the proportion of men who die from gunshot wounds is clearly higher than that of women, being even more pronounced in cases of suicide. For example, Verzeletti et al.⁹ reported a significant predominance of men (92.9%) among the suicides that comprise their study, a figure that drops to 72.9% when referring to homicide victims; Druid¹⁰ notes a figure of 98.59% of men in suicides and 59.2% in homicides; and Karger et al.¹¹ reported figures of 89.4% and 73.3%, respectively.

If we refer specifically to the preference of each sex for this method of suicide, the results are striking¹²: in Argentina, the method was chosen by 37.6% of men, whereas for women the rate was 25.9%; in the US, the figures were 47.8% and 35.7%, respectively. In a similar way, in Venezuela, these figures were 23.3% and 12.2%; in Israel, 25.4% and 9.1%; in Japan, 0.2% and in no case among women; in France, 22.1% and 4.1%; in Germany, 10.3% and 1.4%; in Poland, 1.1% and 0.2%; in Sweden, 17.1% and 0.9%; in the United Kingdom,

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