



## Medicolegal characteristics of defense injuries in cases of homicides

### Sudskomedicinske karakteristike odbrambenih povreda u slučajevima ubistava

Nemanja Rančić\*, Gordana Djurović†, Filip Pilipović‡, Slobodan Savić§

\*Faculty of Medicine of the Military Medical Academy, University of Defence, Belgrade, Serbia; †Health Care Services for Adults, Health Center, "Dr. Dimitrije Pitović", Kosjerić, Serbia; ‡Institute of Orthopaedic Surgery "Banjica", Belgrade, Serbia; §Institute of Forensic Medicine, Faculty of Medicine, University of Belgrade, Belgrade, Serbia

#### Abstract

**Background/Aim.** During the homicidal act, a victim usually tries to defend himself/herself, and due to these attempts he/she could sustain so-called defense injuries, mostly localized on the arms. The aim of this research was to analyze important medicolegal characteristics of defense injuries, particularly regarding their importance in forensic expertise of homicides.

**Methods.** We analyzed autopsies of all homicidal cases with defense injuries in Belgrade during a three-year period.

**Results.** Defensive injuries were registered in 71 victims of murder. The majority (67.61%) of victims with defense injuries were males. About 25% of victims were aged from 21 to 30 years. The majority (60) of victims were not under influence of alcohol. Homicides were mostly (90.14%) performed by mechanical weapons. The highest frequency of defense injuries was noticed in the victims with multiple homicidal injuries localized on the front side of the body. In a half (50.7%) of the cases they were present on both arms of the victim, mostly on the dorsal side of hands and forearms. Bruises were the most frequent form of defense injuries (36.61% out of 71 cases), while incisions, abrasions, gunshot injuries and stab wounds were less common. **Conclusion.** Determination of defense injuries and their medicolegal characteristics enables collecting of facts that are important for legal estimation of homicide, as well as for adequate sentence at the end of the court procedure.

#### Key words:

forensic medicine; homicide; defense mechanisms; serbia.

#### Apstrakt

**Uvod/Cilj.** U toku izvršenja ubistva žrtva se često brani i tada može zadobiti odbrambene povrede, uglavnom lokalizovane na rukama. Cilj rada bio je da se utvrde bitne sudskomedicinske karakteristike odbrambenih povreda, kao i da se ukaže na njihov značaj u sudskomedicinskom rešavanju slučajeva ubistava. **Metode.** Izvršena je epidemiološka retrospektivna studija svih slučajeva ubistava sa odbrambenim povredama, koja su u trogodišnjem periodu izvršena na teritoriji Beograda. **Rezultati.** Kod 71 žrtve ubistva registrovane su odbrambene povrede. Većina (67,61%) žrtava ubistava sa odbrambenim povredama bili su muškarci. Oko 25% žrtava bilo je starosti 21 do 30 godina. Najveći broj (60) žrtava nije bio u alkoholisanom stanju. U najvećem broju slučajeva (90,14%) ubistva su bila izvršena isključivo upotrebom mehaničkog oruđa. Odbrambene povrede bile su najčešće kod žrtava sa višestrukim ubilačkim povredama lokalizovanim na prednjoj strani tela. U oko polovini slučajeva (50,7%) odbrambene povreda su dijagnostikovane na obema rukama žrtve, najčešće na nadlanoj strani šaka i podlaktica. Krvni podlivi bili su najčešća vrsta odbrambenih povreda (36,61% od 71), po učestalosti slede sekotine, oguljotine i ustreline, a najređe su ubodine. **Zaključak.** Utvrđivanjem odbrambenih povreda i njihovih karakteristika prikupljaju se činjenice koje su u sudskom postupku važne za krivičnopravnu ocenu karaktera izvršenog krivičnog dela ubistva i donošenje odgovarajuće sudske presude.

#### Ključne reči:

medicina, sudska; ubistvo; odbrambeni mehanizmi; srbija.

#### Introduction

During an incidence of murder the victim often defends himself/herself, when he/she may receive injuries that are mainly localized on the upper limbs, rarely on the feet or legs<sup>1</sup>. These are so-called defense injuries, which are very important from the forensic point of view, mainly for distinguishing between accidental, suicidal and homicidal act of injuring.

Their presence indicates the homicidal manner of death. Furthermore, it refers to the fact that the victim was conscious in the course of committing the act of murder, at least for some time<sup>1-8</sup>. However, their absence does not necessarily exclude homicide, since the victim may be killed from afar by the shot from behind or there may exist a big discrepancy in power between the attacker and the victim, or the victim may be unconscious or assaulted by multiple attackers<sup>5-9</sup>.

There are two types of defense injuries<sup>6-8</sup>. The first type is defensive or passive wound, resulting from an attempt to protect the victim's head and body by protruding hands in front of himself/herself as a shield, resulting in soft tissue injuries on the dorsal side of forearms and hands, and rarely on the upper arms (Figure 1). If very intense force is applied, for example strong blows with a metal or wooden rod, besides soft tissue injuries bone fractures may occur, most commonly of the ulna. In contrast, the second type, active or offensive injuries occur due to an attempt of the victim to catch the weapon, which causes characteristic injuries on the palm of the hand. The most typical localization of the wound for murders committed with a knife is in the space between the root of the thumb and index finger, because the victim attempts to catch the blade (Figure 2)<sup>3,10</sup>. In case of blows with a blunt weapon, visible injuries on the palmar side of hands, which comes in contact with the weapon, rarely occur<sup>4,11</sup>.



**Fig. 1 – Defense bruising on the dorsal side of the left hand and fingers of the victim killed by blunt injuries.**



**Fig. 2 – Offensively defense incision between the thumb and index finger.**

In addition to the localization of defense injuries, a significant forensic characteristic is their number. Numerous defense injuries on the body of a killed person suggest that the inflicting of injuries lasted longer and that during the act of murder the victim was conscious, and hence suffered physical pains and mental suffering. In this way, the number of defense injuries in the criminal proceedings may be a significant evidence of brutal (cruel) murder, which in legal terms is characterized by intention of the attacker to inflict intense physical pains and mental suffering to the victim before committing murder.

The aim of this study was to determine the significant forensic characteristics of defense injuries, and to emphasize their importance in forensic estimation and criminal proceeding of homicides connected with their occurrence.

## Methods

This paper presents a retrospective epidemiological study of intersection of all murder cases with defense injuri-

es, that were found at autopsies performed at the Institute of Forensic Medicine in Belgrade during a three-year period. The data were obtained by studying the autopsy records, police reports and the results of toxicological analysis. We analyzed gender and age of victims, blood alcohol concentration in victims, way of committing homicide, as well as type, number and localization of defense injuries.

Complete statistical analysis of the obtained data was performed in the statistical software package IBM SPSS Statistics 19. All categorical variables were presented as percentage frequency of certain categories. For categorical variables the statistical significance of differences was examined using  $\chi^2$  test or Fisher's exact test (for small incidence of certain categories). To analyse the proportion of cases that fall into different categories of one variable and to compare the hypothetical value of these proportions, we used  $\chi^2$  test for

testing the quality of correspondence. All the results were assessed by the level of significance of  $p < 0.05$ .

## Results

The total number of homicides with defense injuries in the analyzed period was 71 (49.65% out of all 143 murders). Male victims were significantly more frequent: 48 (67.61%), women 23 (32.39%),  $p = 0.003$ . The victims were mostly 21–30 years old ( $p = 0.125$ ) (Table 1). In relation to age of the victims statistically significant differences by gender were found ( $p = 0.009$ ). Women older than 61 years were most common, while for men the highest incidence of victims aged between 21 and 30 years was found.

The high number of casualties (84.51%) was not under the influence of alcohol (Table 2), victims with the blood alcohol concentration (BAC) less than 0.50‰ were present in our sample. In 3 victims (two males and one female) the BAC was between 0.51 and 1‰. There were no statistically significant differences in the degree of intoxication in relation to gender ( $p = 0.114$ ) and age ( $p = 0.216$ ).

**Table 1**  
**Gender and age distribution of the victims of homicides with defense injuries**

Age (years)	Male, n (%)	Female, n (%)	Total, n (%)
11–20	5 (10.42)	1 (4.35)	6 (8.45)
21–30	16 (33.33)	2 (8.70)	18 (25.35)
31–40	6 (12.50)	1 (4.35)	7 (9.86)
41–50	6 (12.50)	5 (21.72)	11 (15.49)
51–60	7 (14.58)	2 (8.70)	9 (12.68)
61–70	1 (2.09)	6 (26.09)	7 (9.86)
≥71	7 (14.58)	6 (26.09)	13 (18.31)
Total	48 (100)	23 (100)	71 (100)

**Table 2**

**Drunken state in the victims of homicides with defense injuries**

Blood alcohol concentration (‰)	Male, n (%)	Female, n (%)	Total, n (%)
Negative result	38 (79.17)	22 (95.65)	60 (84.51)
< 0.50	8 (16.67)	–	8 (11.27)
0.51–1.00	2 (4.16)	1 (4.35)	3 (4.22)
Total	48 (100)	23 (100)	71 (100)

Murders with defense injuries in most cases were carried out solely by mechanical tools (64–90.14%), rarely as a combination of mechanical injuries and asphyxia (3–4.23%) the violent mechanical asphyxia only (4–5.63%) (Table 3). The largest number of homicides in the analyzed sample was performed by using a firearm (27 cases), which was usually the only way of killing followed by blunt force injuries, stab wounds and incisions (Table 3). There was a statistically significant gender difference regarding the way of committing murder ( $p = 0.032$ ), while the differences in the age of the victim were not noticed ( $p = 0.287$ ). Men were usually killed by firearms, while women mostly sustained injuries inflicted with blunt, pointed and sharp mechanical weapons.

In the majority (36–50.71%) of victims with defense injuries, 5 or more murderous injuries were diagnosed at autopsy, and that was significantly more frequent than other

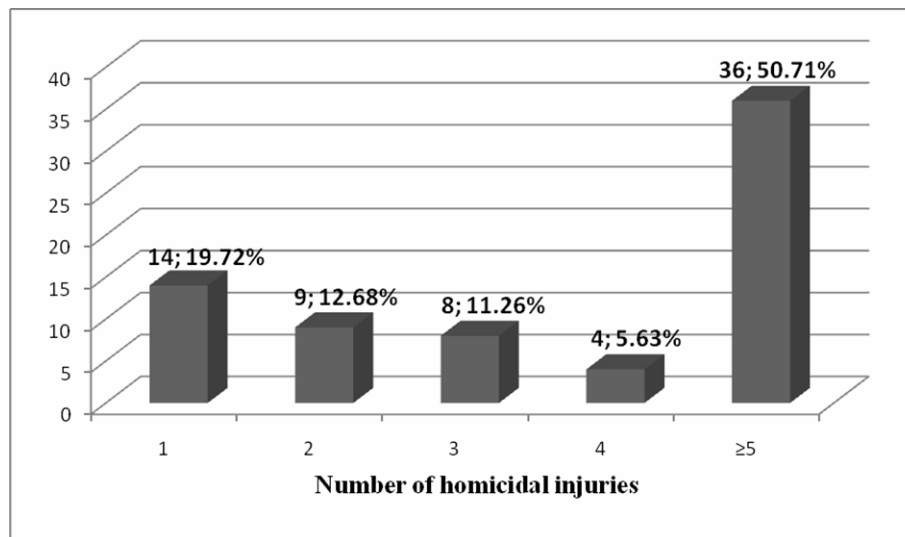
groups with a smaller number of homicidal wounds per one victim ( $p < 0.001$ ) (Figure 3). On the other hand, only one homicidal injury was diagnosed in 14 (19.72%) victims. There was no significant difference in the number of murderous wounds in relation to gender ( $p = 0.305$ ) and age of the victim ( $p = 0.782$ ).

In the majority (44–61.97%) of victims homicidal injuries were localized only on the front side of the body, and it was significantly more frequent comparing to the localization of murderous injuries only on the back side (7–9.86%) or both on the back and the front side of the body (20–28.17%) ( $p < 0.001$ ). There was no statistically significant difference in the localization of homicidal injuries with respect to gender ( $p = 0.542$ ), age ( $p = 0.349$ ), the type of murderous harm ( $p = 0.067$ ) and the number of homicidal wounds ( $p = 0.834$ ).

**Table 3**

**Distribution of homicides with defense injuries by the type of murderous violation**

Type of murder	Male, n (%)	Female, n (%)	Total, n (%)
Firearm injury	20 (41.67)	3 (13.04)	23 (32.39)
Blunt injury	9 (18.75)	5 (21.74)	14 (19.72)
Stab wounds and incisions	7 (14.59)	6 (26.09)	13 (18.31)
Stab wounds	6 (12.51)	–	6 (8.43)
Manual strangulation	1 (2.08)	3 (13.04)	4 (5.64)
Incisions	–	2 (8.69)	2 (2.82)
Firearm injury and blunt force	1 (2.08)	1 (4.35)	2 (2.82)
Manual strangulation and blunt force	1 (2.08)	–	1 (1.41)
Stab wounds and blunt force	–	1 (4.35)	1 (1.41)
Ligature strangulation and blunt force	1 (2.08)	–	1 (1.41)
Firearm injury and incisions	1 (2.08)	–	1 (1.41)
Firearm injury, stab wounds and incisions	–	1 (4.35)	1 (1.41)
Incisions, manual strangulation and blunt force	–	1 (4.35)	1 (1.41)
Stab wounds, incisions and blunt force	1 (2.08)	–	1 (1.41)
Total	48 (100)	23 (100)	71 (100)



**Fig. 3 – Distribution of the victims of homicides with defense injuries according to the number of murderous injuries on one victim.**

In more than half of the victims with defense injuries (36–50.7% of 71), they were diagnosed on both hands of the victim, which was statistically significantly more frequent than the localization of defensive injuries only on the right (19–26.8% of 71) or on the left hand (16–22.5% from 71) ( $p = 0.006$ ). There was no difference in gender ( $p = 0.757$ ), age ( $p = 0.880$ ), the number of murderous wounds ( $p = 0.170$ ) and the type of murderous wounds ( $p = 0.140$ ).

In most cases, defense injuries were localized on the dorsal side of forearms (62–87.33%) and hands (41–57.76%), while they were less frequently registered on the palmar side of hands (23–32.4%) and on the upper arms (13–17%). There was no difference in gender ( $p = 0.695$ ), age ( $p = 0.664$ ), the number of homicidal wounds ( $p = 0.543$ ) and the type of murderous harm ( $p = 0.343$ ).

There was a statistically significant difference in the type of defense injuries found on murder victims ( $p < 0.001$ ). Bruises were the most common type of defense injuries (26–36.61%), either as individual or combined with other types of defensive injuries. In most cases (53–74.65% from 71) only one type of defense injuries was found at autopsy, mostly bruises, while a small number of victims (18) showed the simultaneous presence of two different types of defense

injuries (Table 4). There was a statistically significant difference between the type of defense injuries in males and females ( $p = 0.024$ ). Firearm injuries were most common in men and bruises in women (Table 4). In regard to age ( $p = 0.101$ ), number of murderous wounds ( $p = 0.288$ ), and the localization of defense injuries ( $p = 0.678$ ), no statistically significant differences were found. However, there were statistically significant differences in relation to the side of the body affected with murderous injury ( $p < 0.001$ ) (Table 4). In the victims with murderous injuries only on the front side of the body, the most common of defense injuries were cuts, bruises and abrasions (32 victims). In the victims with murderous injuries on the back side of the body, the most common of defense injuries were cuts and stabbings (6 victims), while in the victims with murderous injuries on both sides of the body, the most common of defense injuries were bruises (7 victims).

### Discussion

By studying the analyzed sample it was found that defense injuries represented frequent and significant findings at autopsy of the victims of homicide. They were found in al-

**Table 4  
Distribution of different types of defense injuries in relation to the total number of homicides with defense injuries and gender of victims**

Type of defense injuries	Male, n (%)	Female, n (%)	Total, n (%)
Bruises	7 (14.58)	10 (43.48)	17 (23.94)
Incisions	8 (16.67)	5 (21.72)	13 (18.31)
Firearm injuries	10 (20.83)	2 (8.70)	12 (16.90)
Abrasions	8 (16.67)	2 (8.70)	10 (14.08)
Bruises and abrasions	7 (14.58)	–	7 (9.86)
Incisions and stab wounds	4 (8.33)	2 (8.70)	6 (8.45)
Firearm injuries and abrasions	3 (6.25)	–	3 (4.23)
Stab wounds	–	1 (4.35)	1 (1.41)
Bruises and incisions	–	1 (4.35)	1 (1.41)
Firearm injuries and bruises	1 (2.09)	–	1 (1.41)
Total	48 (100)	23 (100)	71 (100)

most half of the murdered individuals from our sample, which is in accordance with results of one earlier study of homicides caused by penetrating forces<sup>12</sup>, but it is significantly different from the data of Indian authors, that showed the incidence of murder victims with defense injuries of only 33.3%<sup>13</sup>. During the year 2005 a decline in the number of murders with defensive injuries was registered, and this tendency of decrease in the number of murders, as well as homicides with defensive injuries in the Belgrade population after 2000 has been already demonstrated by earlier researches in our population<sup>14, 15</sup>, and can be explained by gradual stabilizing of the social situation in the post-war period.

Male victims were dominant in the sample, which can be explained by the greater criminogenic potential of men and more frequent participation of males in interpersonal conflicts driven by different motives<sup>5, 11, 13, 16-19</sup>.

The age of victims was an important factor that determined the appearance of defensive injuries, and the obtained result that victims with defensive injuries were mostly between 21 and 30 years of age, is in accordance with the literature<sup>11, 13, 18, 19</sup>. The highest incidence of defensive injuries in young men is associated with the greatest physical strength of these individuals, as well as the most criminogenic potential in this period of life, as opposed to females who usually suffer from their former or current marriage/common-law partner or the intruder<sup>16</sup>.

Analysis of the BAC in the homicidal victims did not support the hypothesis about a possible significant impact of heavy inebriation of victim to its inability to defend against attackers. Katkici et al.<sup>11</sup> have come to similar conclusions. In our analyzed sample 15.49% of the victims with defensive injuries had positive alcohol in blood, while Katkici et al.<sup>11</sup> have found a similarly result (12.31%). Therefore, if attackers estimate that the victim can defend itself, then they resort to the method of committing a murder from a distance (e.g. firearms), and if attackers assess that the victim is unable to defend (e.g. intoxicated, motionless, helpless old people, etc.), then they resort to the method of proximity, especially knife or blunt object.

This study confirmed the results of earlier studies that the use of firearms was important feature of murders in the Belgrade population after 1991<sup>14, 15</sup>. It is very different from most of other European countries where possession of firearms is strictly controlled and regulated by law, and murders in these countries are mostly committed with sharp mechanical weapons<sup>5</sup>. Murders of women often include close contact between the victim and the attacker (stabblings and cuts, mechanical asphyxia), and it allows occurrence of defensive injuries. On the other hand, men are more often the victims of homicides committed with a firearm, in which defensive injuries usually occur during the previous physical contact, which is followed by the use of firearms<sup>15</sup>.

The largest number of murder victims with defensive injuries suffered 5 or more murderous injuries, which is consistent with the literature<sup>11</sup>. With the increasing number of murderous injuries the probability of the presence of defensive injuries constantly increases, due to the prolonged homicidal act. Namely, inflicting of multiple injuries requires a

longer time interval and it is typically accompanied with attempts of the victim to defend himself/herself if the consciousness is maintained. Alcohol intoxication may significantly influence the number of both homicidal and defense wounds, because sober victims have a better ability to defend themselves, so they have a larger number of murderous wounds, because the longer period is needed for their disabling, and therefore there is the greater possibility for the occurrence of defensive injuries<sup>17</sup>.

The highest incidence of defensive injuries in the group of victims with homicidal wounds localized only on the front side of the body can be explained by the fact that such localization of injuries is usually a consequence of the face to face position between the murderer and the victim, which enables the victim to make defensive hand movements toward the attacker. In the forensic sense, the existence of murderous wounds solely on the back side of the body of the victim with defensive injuries may indicate that an attacker approached the victim from behind, but the murder act was not instantaneously fatal, so there was a chance for the victim to defend himself/herself, at least for some time. From the legal point of view, such a situation can be interpreted as a murder committed in insidious way. It is also possible that there were two or more attackers, and that one of them inflicted fatal injuries to the back of the body.

In contrast to the previous studies which showed that defensive injuries were mostly localized on the left hand<sup>11-13</sup>, our study shows that about a half of the victims had simultaneous existence of defensive injuries on both hands, which is explained by the intention to defend from murderer in any way.

Defensive injuries can be inflicted by the same weapon that was used for inflicting homicidal wounds to the victim, but they can also be produced by other tools. This often happens in murders committed by multiple attackers using different tools, when at one victim there may be many defensive injuries of various types<sup>13</sup>. In our analyzed sample, the most murder victims sustained only one type of defensive injuries. The bruises were most commonly registered, mostly localized on the dorsal side of the hands and forearms, which is explained by the way of defense of the victim from an attack protruding hands in front of himself/herself as a shield<sup>11</sup>. As previously indicated, defensive blunt injuries can be found in the victim killed by other types of homicidal injuries, for example stabblings, cuts or gunshot wounds. Such blunt injuries typically occur during the fight that precedes the fatal injuring. When blunt tool is used, defensive injuries are usually in the form of numerous contusions and bruises, which are primarily localized on the dorsal side of the forearms and hands<sup>20</sup>.

In cases of firearm homicide in which defensive injuries were the gunshot wounds (in 12 cases as isolated, and in 4 combined with abrasions and bruises), they were created by the victim protruding hands in front of himself/herself either in an attempt to catch the attacker's firearm or to instinctively protect the head or the body. These defense wounds were typically localized on the forearms.

In cases of murders committed with a knife, as opposed to more frequent deadly murderous stabblings, most defensive injuries were cuts in comparing to stabblings<sup>20</sup>. The cuts

on the hands arise in the attempt to capture a tool or the arm of the attacker<sup>20</sup>. Similar to our sample, Turkish study shows that most of the victims had passive defensive injuries inflicted by the knife of the attacker<sup>11</sup>.

### Conclusion

Murders with defense injuries are mostly recorded in men aged from 21 to 30, who are killed in a sober state. The use of firearms is the essential feature of murders of men, while women are typically killed with sharp and pointed weapons. Defensive injuries are usually registered in murders with homicidal wounds predominantly localized on the front of the body. In our analyzed sample, the most murder victims sustained only one type of defensive injuries. The bruises were most commonly registered, mostly localized on the dorsal side of the hands and forearms.

Diagnosing defensive injuries at autopsy, exact determination of their number and accurate description of their

appearance, with the obligatory photo-documentation, is of great importance for forensic reconstruction of the course of homicide, its duration, identification of homicidal weapon or weapons, and assessment of physical and mental condition of victims before and during murder. Future researches should indicate whether there is a tendency of maintaining or modifying the characteristics of homicides associated with defensive injuries.

### Acknowledgments

The authors would like to express their gratitude to Nina Pilipovic, Medical High School, Belgrade, Serbia, for reading and translation of the draft versions of this article, as well as for helping in English language.

The authors would like to express their gratitude to the Ministry of Education Science and Technological Development of the Republic of Serbia for Grant N°175014, out of which this research project was partially financed.

### R E F E R E N C E S

1. Reddy KS. The essentials of forensic medicine and toxicology. 29th ed. Hyderabad: Medical Book Company; 2010.
2. Milanović M. Forensic medicine. 2nd ed. Beograd, Zagreb: Medicinska knjiga; 1979. (Serbian)
3. Saukko P, Knight B. Knight's forensic pathology. 3rd ed. London: Hodder Arnold; 2004.
4. Popović V, Atanasijević T. Forensic medicine. Beograd: Libri Medicorum; 2010. (Serbian)
5. Brunel C, Fermanian C, Durigon M, Grandmaison GL. Homicidal and suicidal sharp force fatalities: Autopsy parameters in relation to the manner of death. *Forensic Sci Int* 2010; 198(1–3): 150–4.
6. Bohnert M, Hüttemann H, Schmidt U. Homicides by sharp force. In: Tsokos M, editor. *Forensic pathology reviews*. Totowa: Humana Press; 2006. p. 65–89.
7. Dettmeyer RB, Verhoff MA, Schütz HF. *Forensic medicine: fundamentals and perspectives*. Berlin, Heidelberg: Springer; 2014.
8. Shkrum M, Ramsay D. *Forensic pathology of trauma: common problems for the pathologist*. Totowa: Humana Press; 2007.
9. Dettling A, Althaus L, Haffner HT. Criteria for homicide and suicide on victims of extended suicide due to sharp force injury. *Forensic Sci Int* 2003; 134(2–3): 142–6.
10. Spitz WU. *Spitz and Fisher's medicolegal investigation of death*. 4th ed. Springfield, Illinois: Charles C. Thomas Publisher; 2006.
11. Katkici U, Ozkök MS, Orsal M. An autopsy evaluation of defence wounds in 195 homicidal deaths due to stabbing. *J Forensic Sci Soc* 1994; 34(4): 237–40.
12. Metter D, Benz D. Self-defense injuries in homicides caused by penetrating forces. *Z Rechtsmed* 1989; 102(5): 277–91.
13. Mobanty MK, Panigrabi MK, Mobanty S, Dash JK, Dash SK. Self-defense injuries in homicidal deaths. *J Forensic Legal Med* 2007; 14(4): 213–5.
14. Rancic N, Erceg M, Savic S. Medicolegal characteristics of firearm homicides. In: *Abstract Book of 6th Annual Meeting of the Balkan Academy of Forensic Sciences*; 2009 June 18–21; Kavala, Greece: PATH 112. (abstract) 2009.
15. Rancic N, Erceg M, Radojevic N, Savic S. Medicolegal characteristics of firearm homicides in Belgrade, Serbia: Before, during, and after the war in the Former Yugoslavia. *J Forensic Sci* 2013; 58(6): 1549–53.
16. Mobanty MK, Panigrabi MK, Mobanty S, Das SK. Victimologic study of female homicide. *Leg Med (Tokyo)* 2004; 6(3): 151–6.
17. Karlsson T. Sharp force homicides in the Stockholm area, 1983–1992. *Forensic Sci Int* 1998; 94(1–2): 129–39.
18. Mobanty S, Mobanty SK, Patnaik KK. Homicide in southern India: A five-year retrospective study. *Forensic Med Anat Res* 2013; 1(2): 18–24.
19. Hungar BS, Harish S, Girish Chandra YP, Praveen S, Jayanth SH. Study of defence injuries in homicidal deaths: an autopsy study. *J Forensic Leg Med* 2012; 19(4): 207–10.
20. Ambade VN, Godbole HV. Comparison of wound patterns in homicide by sharp and blunt force. *Forensic Sci Int* 2006; 156(2–3): 166–70.

Received on February 18, 2015.

Revised on November 18, 2015.

Accepted on November 25, 2015.

Online First July, 2016.