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Gunshot injuries in Owerri, a 10 years (2001-2010) postmortem study.

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Abstract

This study is to establish the demographic parameters, typical entry and exit wound sites, immediate causes of death and annual incidence of gunshot injuries in Owerri. The records of gunshot victims in the case notes, Post-mortem registers, departmental and medical records databases of FMC Owerri were used as the sources of data for this study from January 2001 to December 2010. One hundred and one cases of gunshot injuries (GSI) that resulted in death met the inclusion criteria of this study. Ninety-six per cent of the victims were males; mean age was 52.2 ± 21.3 years and age range of 19-71 years. The most affected age groups were those in the 21-30 years age groups followed by 31-40 years. The most frequent site of entry wound was thorax (36.7%), followed by head and neck region (22.8%), abdomen (19.8%) and lower limbs (13.9%). A total of 56.4% (57 cases) had established sites of exit wounds while in 33.7% (34 cases) the exit wounds were not defined. The incidence of GSI was highest in 2003 (17.82%), followed by 2008 (14.85%) and 2007 (13.46%). The immediate causes of death were a haemorrhagic shock in 84 cases (83.2%), head injuries with skull fractures 10 cases (9.9%) and septicaemia in 7 cases (6.9%). Effective legislation and gun control policy would prevent the unnecessary death of our young men through violence, gangsterism and substance abuse.

Keywords: Gunshot, Injuries, Postmortem, Owerri

1. Introduction

Deaths due to gunshot injuries continue to increase the world over with variation in its incidence in different parts of the world [1]. Obalum et al. [2] reported that the rising incidence rate of gunshot injuries (GSI) remains one of the leading causes of death, extended hospitalization and economic losses worldwide. The severity of gunshot injuries depends on the effects of the mechanical interaction between the bullet and tissues with resultant cavities produced by the pellets [3]. In high-income countries like the USA, a significant number of gunshot wounds relates to suicide attempts unlike in developing countries where the spates of communal and ethnic clashes, political violence and armed robberies are the predominant causes of GSI [4, 5, 6]. In Maiduguri, Abbas et al. [7] reported that gunshot injuries were rare in Nigeria until the civil war of 1967-1970, with marked involvement of males. Gunshot violence has, besides its medical importance, also an enormous economic impact as the third most costly aetiology of injury and the fourth most expensive form of hospitalization [8].

The objective of this study is to establish the demographic parameters, typical entry and exit wound sites, immediate causes of death and annual incidence of gunshot injuries in Owerri, the capital city of Imo State, Nigeria.

2. Material and methods

The records of gunshot victims in the patient's case notes, postmortem registers, and databases of the Departments of Pathology and Medical records of FMC Owerri were used as the sources of data for this study from January 2001 to December 2010. The complete post-mortem examination was done by Consultant Pathologists in the Department of Pathology, using laid down protocols. The postmortem findings were analyzed for age, sex and cause of death as well as

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some vital anatomic parameters to establish the immediate causes of death, the entry and exit wound sites. These data were analyzed using SPSS version 16.

3. Results

Of 486 autopsies performed in the period under review, 101 cases were due to gunshot injuries which constituted 20.8% of all the postmortem examinations conducted in FMC Owerri. Ninety-six per cent of the victims were males; mean age was 52.2 ± 21.3 years and the age range was 19-71 years. The most affected age groups were those in the 21-30 age groups followed by 31-40 years. There was no case of GSI in the pediatric age group (1-18 years); however, there were 5 cases (4.95%) involving victims that were 19 and 20 years old. Table 1 shows the distribution of the gunshot victims among these age groups. The most frequent site of entry wound was the thorax (chest), followed by the head/neck and abdomen. Table 2 and 3 show the distribution of entry and exit wounds, respectively, in all the regions of the body. The highest cases of GSI occurred in 2003, followed by 2009. Table 4 illustrates the annual incidence of GSI.

Table 1 The distribution of the gunshot victims among the age groups.

S/n	Age group	Frequency	%
1	1-10	0	0.00
2	11-20	5	4.95
3	21-30	49	48.51
4	31-40	19	18.81
5	41-50	15	14.85
6	51-60	8	7.92
7	61-70	4	3.96
8	71-80	1	0.01
Total		101	100

Table 2 The distribution of all the entry wounds in different parts of the body

s/n	Region	Frequency	%
1	Thorax	37	36.7
2	Head and neck	23	22.8
3	Abdomen	20	19.8
4	Lower limb	14	13.9
5	Pelvis	3	2.97
6	Upper limb	1	0.01
7	Undetermined	3	2.97
Total		101	100

Table 3 The distribution of all the exit wounds in different parts of the body

s/n	Region	Frequency	%
1	Thorax	19	18.81
2	Head/neck	17	16.83
3	Abdomen	11	10.89
4	Lower limb	6	5.94
5	Pelvis	3	2.97
6	Upper limb	1	0.99
7	Retained bullet	10	9.90
8	undetermined	34	33.66
Total		101	100%

Table 4 Shows the annual incidence of gunshot injuries in Owerri.

s/n	Year	Frequency	%
1	2001	4	3.96
2	2002	6	5.94
3	2003	18	17.82
4	2004	8	7.92
5	2005	4	3.96
6	2006	8	7.92
7	2007	14	13.46
8	2008	12	11.88
9	2009	15	14.85
10	2010	12	11.88
Total		101	100

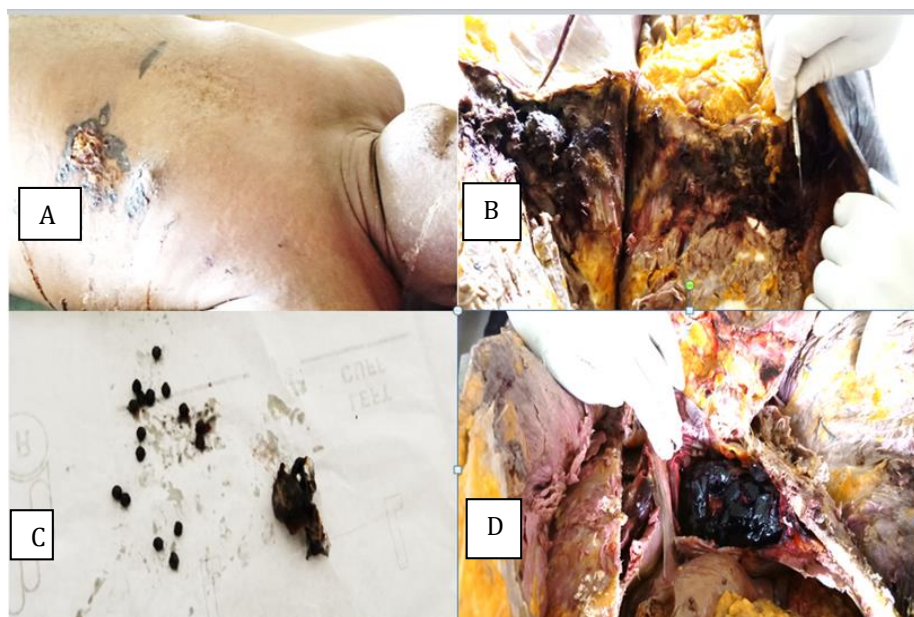


Figure 1 A- Photomicrograph showing entry wound in the left thoracic region just below the left nipple. B- Shows the charred bullet tract across the anterior chest wall of the victim. C- Shows sixteen metal pellets and plastic canister. D- Shows massive haemothorax with cardiac tamponade.

4. Discussion

Gunshot wounds are becoming a common public health problem worldwide with a recent increase in developing countries due to poverty, unemployment, political instability and unequal distribution of wealth [9, 10]. In this study, ninety-six per cent of the victims were males, and the mean age was 52.2 ± 21.3 years with age range of 19-71 years. The most affected age groups were those in the 21-30 years age group, followed by 31-40 years age groups and 70% of the victims were aged 21-50 years. These observations agreed with previous studies [11, 12, 13, 14, 15, 16, 17, 18]. However, several reports demonstrated that gender disparity was less marked in Abia, Tanzania and Texas [19, 20, 21, 22, 23]. In this study, there were five cases of gunshot-related death in the victims aged 10-20 years, constituting about 4.95% of all cases. However, in Connecticut USA, Zavoski et al. [24] reported that more than 80% of deaths from gunshot wounds occurred among 15 to 19-year-old males. A similar report from Pakistan demonstrated that 53.4% of children involved in gunshot-related suicide were aged 16-20 years [22].

The predictors of the severity of gunshot injuries were the site of the entry wound, the velocity of the bullet and factors associated with higher energy transfer such as bullet fragmentation and bone fractures [25]. In this study, the most frequent site of entry wound was thorax (36.7%), followed by head and neck region (22.8%), abdomen (19.8%) and lower limbs (13.9%). These observations agreed with other studies [13, 16, 22, 26]. However, reports from different parts of Nigeria and Africa showed that the extremities were the most frequent site of entry wounds in gunshot victims [2, 7, 9, 11, 14, 18, 23, 21]. This was because most gunshot injuries in these places were due to armed robbery in which the criminals were not in dire need to take the life of their victims as compared to our areas where GSI were related to kidnapping, homicide, civil conflicts and brutality from armed security personnel [2, 6, 7, 12, 21, 29]. Although the site of entry wound could suggest the intention of the assailant, the study of bullet tracts were usually instrumental in differentiating between suicide and homicide [30].

The exit wounds followed the pattern of the entry wounds. A total of 56.4% (57 cases) had identified sites of exit wounds while in 33.7% (34 cases) the exit wounds were not established. Furthermore, 9.9% (10 cases) of the victims had bullet canisters and pellets lodged in their bodies. In Durban South Africa, Inchien et al. [13] reported that 53% of patients with GSI had established exit wounds while 47% had a bullet lodged in their bodies. The large proportion of undetermined cases of exit wound could be reduced if post-mortem roentgenography were used to detect metal pellets lodged in tissues.

The incidence of GSI was highest in 2003 (17.82%), followed by 2008 (14.85%) and 2007 (13.46%). Most of these years corresponded to general elections, times of exacerbated kidnapping, armed robbery and conflicts among local criminal gangs [7,14,16,31].

Injuries following GSI were usually fatal. In this study, the majority of the entry wounds were located in the thorax, which contains vital viscera. The immediate causes of death were haemorrhagic shock in 84 cases (83.2%), head injuries with skull fractures 10 cases (9.9%) and septicaemia 7 cases (6.9%). Similar observations were made in Irrua, Texas and Serbia [12, 19, 29]. In Maiduguri, North-east Nigeria wound infections were the leading cause of death. Ojo and Aliyu et al. [23, 32] reported that 3.4% and 2.7% of victims died of septicemia, respectively.

5. Conclusion

The proliferation of illegal arms and ammunitions in our society has grave consequences on the behaviour of our youths; this has caused loss of lives of males in their prime age of productive lives. There is a dire need for effective control legislation and enforcement to eradicate illegal arms possession, criminal gang formation and drug abuse among our youths.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no conflict of interest.

Ethical approval

The research ethics approval was obtained from Health research ethics committee of Federal Medical Centre Owerri. The approval number is FWC/OW/HREC/132

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