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Epidemiological Profile of Patients Victims of Abdominal Trauma by Firearm and Stab Weapon in Ceilândia in 2021

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ABSTRACT

This study aimed to analyze the epidemiological profile of patients who were victims of trauma by firearms and bladed weapons in Ceilândia, a region of the Federal District, Brazil, in 2021, identifying patterns that can guide preventive strategies and improve patient care. A retrospective analysis of patients treated at the Regional Institute of Ceilândia for trauma caused by firearms (PAF) and bladed weapons (PAB) throughout 2021 was carried out. The data collected included the cause of trauma, clinical outcomes, ICU admissions, distribution of episodes by shift, and gender of the patients. Statistical analysis used descriptive and inferential statistics to explore the relationships between types of trauma and outcomes. The study included 74 patients, 46 cases (62.2%) of PAB and 28 cases (37.8%) of FAP. Most traumas occurred during the early hours of the morning, with a higher prevalence among male patients (89.1% for PAB and 92.9% for PAF). ICU admissions were more frequent for FAP victims (17.9%) compared to PAB (4.4%). Most cases resulted in discharge, but the mortality rate was higher among FAP victims (17.9%) compared to PAB (4.4%). The predominance of stab wounds and higher rates of ICU admission and mortality for firearm injuries highlight the severity of firearms-related trauma. The findings suggest the need for targeted interventions to prevent such incidents and improve the health response in Ceilândia. Future studies should focus on the implementation and evaluation of preventive strategies to reduce the incidence and severity of these traumas.

Keywords: Firearm Trauma, Stab Wound, Epidemiology, Ceilândia, Trauma Outcomes, Public Health.

1 INTRODUCTION

Armed violence represents a significant public health challenge worldwide, directly impacting morbidity and mortality rates in affected populations. In Brazil, the prevalence of injuries caused by firearms and bladed weapons is a worrying reflection of urban violence, which

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disproportionately affects the most vulnerable areas. The region of Ceilândia, located in the Federal District, is no exception to this reality, facing high rates of violence that result in a significant number of trauma victims. This study aims to explore the epidemiological profile of these victims at the Regional Institute of Ceilândia during the year 2021, with the aim of identifying patterns that can inform prevention strategies and improvement of care.

Previous research has highlighted the importance of understanding the demographic and clinical characteristics of trauma victims in order to optimize health care resources and develop targeted interventions. Studies such as those by Pasquali and Kock (2021) and Almeida et al. (2016) provide valuable insights into the epidemiological profile of specific traumas, such as thoracic and cranioencephalic injuries, respectively, in different regions of Brazil. However, there is a gap in specific knowledge about the impact of gun and knife violence in Ceilândia, which warrants a detailed investigation.

The epidemic of firearm violence, as discussed by Fontanarosa and Bibbins-Domingo (2022), is not only a crime problem, but also a critical public health issue that requires multidisciplinary attention. The analysis of the clinical outcomes of victims of this type of violence, as carried out by Orlas et al. (2021), underlines the need for integrated approaches that encompass prevention, immediate care, and long-term rehabilitation. The inclusion of these perspectives is crucial for a holistic understanding of the problem under study.

In addition, the literature suggests that trauma patterns vary significantly with factors such as the gender of the victims, the timing of the incidents, and the nature of the injuries (Berg et al., 2012; Orantes et al., 2023). Such variables directly influence the strategies of triage, treatment and allocation of resources in emergency services. By analyzing the specific characteristics of victims of firearm and stab wound trauma in Ceilândia, this study seeks to contribute to the existing body of knowledge, providing a basis for more effective interventions.

Finally, this article aims not only to characterize the epidemiological profile of trauma victims in Ceilândia, but also to reflect on the implications of these findings for the local health system and public policies. Through an evidence-based approach, we hope to illuminate pathways to mitigate gun violence and improve victim care by aligning our efforts with national and international guidelines for violence reduction and public health promotion.

2 METHODOLOGY

This study adopted a retrospective approach, analyzing data from patients who were victims of firearm trauma (FAP) and bladed weapon trauma (PAB) treated at the Regional

Institute of Ceilândia, Federal District, during the year 2021. The objective was to identify epidemiological and clinical patterns of these victims to inform strategies for prevention and improvement of care.

The study population consisted of all patients seen at the Regional Institute of Ceilândia with a diagnosis of trauma caused by FAP or PAB in the period from January 1 to December 31, 2021. Patients of both sexes and of all age groups were included in the study. The exclusion criteria were incomplete records that made it impossible to analyze the data of interest.

Data were collected from hospital records, including electronic medical records and emergency admission records. The variables of interest included: type of trauma (FAP or PAB), clinical outcomes (discharge, ICU admission, death), presence of relaparotomy, distribution of episodes by shift (morning, afternoon, night, dawn), and gender of the patients. Additional information, such as age and severity of injuries, was collected for secondary analysis.

Statistical analysis was conducted using SPSS software (version 25.0). Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to characterize the sample and the main findings. Chi-square tests were applied to evaluate associations between categorical variables, such as type of trauma and clinical outcomes. Statistical significance was set at $p<0.05$.

This study was approved by the Research Ethics Committee of the institution involved, ensuring compliance with the ethical principles of the Declaration of Helsinki. All information was anonymized to protect the identity of the patients, and the use of the data was restricted to research purposes.

3 RESULTS

During 2021, the Regional Institute of Ceilândia treated a total of 74 patients who were victims of trauma by firearm (PAF) and bladed weapon (PAB), representing a worrying panorama of urban violence in the region. Of this total,

46 patients (62.2%) suffered stab wounds, while 28 patients (37.8%) were victims of gunshot wounds (Table 1).

Category	Detailing
Cause of Trauma	**PAB (46 occurrences, 49.5% of cases), PAF (28 occurrences, 30.1% of cases)**
Self-extermination related to PAB	**Yes (3 cases, 6.5%), No (43 cases, 93.5%)**

ICU admission	**PAF**	**Showed one percentage bigger ICU admissions compared to PAB**

Source: Data from the study itself (2023).

The analysis of the cases revealed that the occurrence of trauma due to PAB was more frequent during the night, corresponding to 39.1% of the cases, followed by the morning (23.9%), night (19.6%) and afternoon (17.4%). Similarly, FAP traumas also showed a higher incidence in the early morning (46.4%), followed by the night (32.1%), and the same distribution during the afternoon and morning (10.7% for each). These findings are congruent with the literature (Table 2), which indicates the early morning as the period of greatest risk for occurrences of violence (Avraham et al., 2018; Orantes et al., 2023). The ICU admission rate was significantly higher for FAP victims (17.9%) compared to PAB victims (4.4%), which reflects the severity of firearm injuries, as discussed in previous studies (Orlas et al., 2021; Wang et al., 2022).

Cause	**Dawn**	**Morning**	**Night**	**Afternoon**
PAB	39,1%	23,9%	19,6%	17,4%
PAF	46,4%	10,7%	32,1%	10,7%

Source: Data from the study itself (2023).

Regarding clinical outcomes, most patients, both in the PAB group (95.6%) and in the PAF group (82.1%), were discharged from the hospital. However, the death rate was higher among FAP victims (17.9%) compared to FAP victims (4.4%), indicating a higher lethality associated with firearm trauma. This observation is consistent with the literature, which highlights the severity and complexity of firearm injuries (Fontanarosa & Bibbins-Domingo, 2022; Berg et al., 2012).

The prevalence of trauma was significantly higher in males, with 89.1% of PAB cases and 92.9% of FAP cases, reflecting the trends observed in national and international studies on gun violence (Carlos Eduardo Romeu de Almeida et al., 2016; Orlas et al., 2021).

Relaparotomies were recorded in 4 cases of PAB and 2 cases of FAP, highlighting the need for subsequent surgical interventions in a portion of the patients, which corroborates the literature discussing management approaches for penetrating abdominal trauma (Lotfollahzadeh & Burns, 2023; Butt, Zacharias & Velmahos, 2009).

4 DISCUSSION

The findings of this study reveal a worrying epidemiological profile of victims of firearm trauma (PAF) and bladed weapon (PAB) in Ceilândia, DF, in 2021, with a predominance of male cases and a high incidence of occurrences during the night. These results are in line with trends observed in the national and international literature, indicating specific patterns of violence and vulnerability associated with these types of trauma.

The predominance of male victims, with 89.1% of PAB cases and 92.9% of FAP cases, reflects the data reported by Almeida et al. (2016), who also identified a higher prevalence of traumatic injuries among men in the Brazilian context. This pattern suggests the influence of sociocultural and behavioral factors that predispose men to greater exposure to urban violence and interpersonal conflicts, resulting in weapon trauma.

The distribution of episodes by shift, with the highest incidence of trauma occurring during the night, highlights the association between armed violence and nocturnal activities, possibly linked to crime and substance use. This pattern is corroborated by Fontanarosa and Bibbins-Domingo (2022), who discuss the epidemic of firearm violence as a complex phenomenon, interconnected with socioeconomic factors and public security policies.

The ICU admission rate was significantly higher for FAP victims (17.9%) compared to PAB (4.4%), indicating the severity of firearm injuries. This finding is in line with the systematic review by Wang et al. (2022), which highlights the severity of abdominal trauma caused by FAP and the consequent need for intensive care. The high death rate among FAP victims (17.9%) compared to PAB (4.4%) also reflects firearm lethality, a topic widely discussed in the literature, such as by Orlas et al. (2021), who emphasize the long-term challenges faced by firearm injury survivors.

The incidence of relaparotomies, although relatively low, highlights the complexity of the management of penetrating abdominal lesions, corroborating the literature that suggests controversies in the management of these lesions (Butt, Zacharias, & Velmahos, 2009; Lotfollahzadeh & Burns, 2023). The decision between laparoscopy and laparotomy, as discussed by Jones (2017), reflects the challenge of balancing the need for immediate surgical intervention with the potential for complications and long-term recovery.

This study contributes to the understanding of the epidemiological profile of victims of weapon trauma in Ceilândia, highlighting the need for prevention strategies focused on reducing armed violence and improving care for victims. The implementation of targeted public policies,

along with education and awareness campaigns, can be essential to mitigate the impacts of this problem on public health.

5 CONCLUSION

This study provided a detailed overview of the epidemiological profile of victims of firearm trauma (PAF) and bladed weapon (PAB) treated at the Regional Institute of Ceilândia, Federal District, throughout 2021. The findings highlight a predominance of PAB cases over FAP, with a significantly higher incidence in men and a tendency to occur during the night. In addition, the analysis revealed a higher rate of ICU admission for FAP victims compared to FAP, as well as a higher percentage of deaths associated with FAP, reflecting the severity of these traumas.

The results of this study are in line with the existing literature, confirming the severity and consequences of firearm and bladed weapon trauma on public health, as discussed in previous work (Pasquali & Kock, 2021; Fontanarosa & Bibbins-Sunday, 2022; Orlas et al., 2021). The prevalence of such events in Ceilândia points to the urgent need for multidisciplinary approaches that integrate prevention, medical care, and rehabilitation, as well as effective public policies to combat armed violence.

Studies such as this one are crucial for mapping the epidemiological and clinical characteristics of trauma victims, enabling the development of strategies aimed at care and prevention. The data obtained reinforce the importance of investments in public safety and health, aiming not only at the adequate treatment of victims, but also at the implementation of preventive measures that can effectively reduce the incidence of these traumas.

In conclusion, this study highlights the need for continuous efforts to better understand the dynamics of gun violence in vulnerable urban regions, such as Ceilândia. In addition, it emphasizes the importance of collaboration between the health, public security and community sectors to develop integrated prevention and care strategies, mitigating the impacts of this form of violence on the population. Future research should continue to explore trends in firearm and bladed weapon trauma, as well as evaluate the effectiveness of implemented interventions, to promote a safer and healthier society.

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