Original Article

A Retrospective Analysis of Assault Admissions at a Regional Medical College in Jharkhand: Examining Factors that Impact Patient Outcome

Sumegha Rana[1], Vivek Bhasker[2], Rishabh Kr Rana[3], AK Choudhary[4], Dharmendra Kumar[5]

[1]Assistant Professor Department of Surgery, S.B.M.C.H., Hazaribag, [2]Assistant Professor Department of Surgery, S.B.M.C.H., Hazaribag, [3]Assistant Professor Department of community medicine, SNMMCH, Dhanbad, [4]Associate Professor Department of Surgery, S.B.M.C.H., Hazaribag, [5]Assistant Professor, Dept of Physiology, LCMCH, Palamu.

How to cite this article: Sumegha Rana, Vivek Bhasker, Rishabh Kr Rana et. al. A Retrospective Analysis of Assault Admissions at a Regional Medical College in Jharkhand: Examining Factors that Impact Patient Outcome. Indian Journal of Public Health Research and Development / Vol. 16 No. 1, January-March 2025.

Abstract

Background: Assault admissions pose a significant burden on healthcare systems worldwide. Understanding factors influencing surgical intervention for assault victims can improve resource allocation and patient care. This study aims to analyze a large dataset of assault admissions at a regional medical college to identify factors associated with surgical management.

Methods: We conducted a retrospective analysis of admissions at Sheikh Bhikhari Medical College (SBMCH), Hazaribag, Jharkhand India, between Jan 2023 and December 2023. We reviewed data for over 4,000 admissions and identified 1,339 cases admitted due to assault-related injuries. Logistic regression analysis was used to investigate the association between potential predictors (age category, length of stay, time of admission, and gender) and the likelihood of requiring surgical intervention.SPSS v29.0 was used while a p value of <0.05 was considered as of statistical significance.

Result: Assault admissions constituted approximately 30% of the total admissions during the study period. Time of admission significantly impacted the need for surgery. Patients admitted later (off-hours/) had slightly higher odds of requiring referrals. Gender also emerged as a significant predictor. Age category and length of stay did not show statistically significant associations with surgical intervention.

Conclusion: This study highlights the high prevalence of assault admissions and the potential influence of time of admission and gender on surgical management. Additionally, the high referral rate to higher centers suggests a need for increased access to neurosurgical services within the region. The challenge of patients leaving against medical advice (LAMA) warrants further investigation. Future research should explore specific injury types requiring surgery and potential gender differences in assault injuries.

Key words: Hazaribag, Jharkhand, Surgery Admissions, Assault Cases, Regional Medical College.

Corresponding Author: Sumegha Rana, Assistant Professor Department of Surgery, S.B.M.C.H., Hazaribag, Jharkhand.

E-mail: rana.sumegha@gmail.com

Submission date: March 17, 2024 **Revision date:** April 30, 2024 **Published date: December 28, 2024:**

Introduction

Assault, encompassing various forms of interpersonal violence, remains a significant public health concern in India, impacting individuals and communities across diverse demographics. While the national crime rate for assault has shown a slight decrease in recent years, Jharkhand continues to face a concerning prevalence with a 2022 rate of 6.0% [1]. This issue extends beyond individual suffering, contributing to the broader burden of injury and mortality in the state.

Globally, the World Health Organization estimates that 3.2% of homicides per 100,000 population occur in India[2]. Though assault differs from homicide in severity, it often serves as a precursor to more serious violence. Additionally, assault, particularly intimate partner violence (IPV), has been linked to significant psychological and physical health consequences for victims[3].

Global Burden of Disease (GBD) evidence indicates that assault-related injuries contribute to 0.44% of all-cause mortality in India, with a decadal annual change of 1.48%[4]. This highlights the increasing burden of assault-related health issues within the country. Further categorizing assault cases reveals a complex landscape. Research by Khurana et al. identifies various types, including interpersonal violence, sexual assault, robbery, IPV, other specified assaults, and even unknown assault types. Understanding this spectrum is crucial for developing comprehensive interventions [5].

Despite the alarming statistics, data on the specific burden of assault patients seeking treatment in government-run medical colleges in India remains limited. This study aims to address this gap by investigating the burden of assault cases at Sheikh Bhikhari Medical College (SBMCH) in Hazaribag, Jharkhand.

The primary objective of this study is to achieve the following

- To measure the extent of assault, we will analyze the frequency of admissions related to assault at SBMCH during a specific timeframe. We will classify these admissions based on the specific type of attack, such as physical or sexual.
- The objective of this study is to provide a comprehensive analysis of the assault population by examining their demographic characteristics, clinical manifestations, and the effectiveness of the treatments they get while being treated for assault-related injuries.
- Assess institutional capability: We will examine the current infrastructure and resources at SBMCH to efficiently handle assault patients. This will involve evaluating any constraints in resources, infrastructure, or psychosocial support services, specifically for individuals who have experienced intimate partner violence (IPV).

Methods

Study Design: This study was a retrospective cohort study conducted at the Department of Surgery, SBMCH, Hazaribag.

Setting: Sheikh Bhikhari Medical College (SBMCH) was established in 2019.It is a full-fledged government medical college affiliated with Vinoba Bhave University, Hazaribag, Jharkhand and recognized by the National Medical Commission (NMC).The college offers a comprehensive Bachelor of Medicine, Bachelor of Surgery (MBBS) program. SBMCH is associated with a 500-bed teaching hospital that provides quality healthcare services to the community.

Participants: All admissions in the surgery ward with a history of assault fulfilling the inclusion criterion . Eligibility/Case definition of study sample. Any case admitted in the surgery ward with assault related injuries mentioned in records.

Inclusion criteria: We retrospectively reviewed manual health records (HRs) of patients admitted to the Department of Surgery at Sheikh Bhikhari Medical College (SBMCH), Hazaribag, India, between January 2023 and December 2023.Wefocussed on patients admitted for assault-related injuries, identified through a thorough review of admission diagnoses and medical history documented in the health records.

Exclusion criteria: Patients admitted to the ortho and gynae ward.

Patients with trauma other than assault.

Data Sources/Measurements:

We accessed the indoor admission registers medical records, to access the data points collected for each patient (e.g., demographics, clinical characteristics, treatment details, outcomes in terms of referral, treatment completed and length of stay.).

Bias: Incomplete data will be left out from the analysis, to ensure chart review bias, we imparted capacity building sessions and pilot the project for testing the internal and external validity of the data collection tool. Once the data was collected before analysis the data was re-identified.

Study Size: We examined 4320 records of admission of which 20 records were not complete. So we had 4300 records identified for analysis.

Quantitative Variables: Age: Measures of central tendency (mean, median) and dispersion (standard deviation) were calculated to describe the age distribution of assault patients.

Length of Stay: Measures of central tendency (mean, median) and dispersion (standard deviation) were used to analyze the duration of hospitalization for assault patients.

Time of Admission: Descriptive statistics were used to describe the temporal distribution of assault admissions by analyzing the time of admission (e.g., daily, hourly). Correlations were checked for using the test of association like Chi Square test.

Result

The total number of admissions included in the analysis was 4300 in the general surgery ward, out of which 59.3% were male patients and 40.7% were females. Among these patients, total cases of assault were 1339, out of which approx 60% were males . Table 1 depicts the result clearly.

Table 1: Details of the Admissions in Surgery Ward (Assault cases Vs Non Assault Cases)

	Gender		Total Admissions	p value
	Female	Male		
Other Admissions	1247	1714	2961	<0.00*
	71.20%	67.20%	68.90%	
Admission with Assault	504	835	1339	
	28.78%	32.76%	100%	
Total	1751	2549	4300	
Percentage out of Total	40.7%	59.3%	100.0%	

Table 2: Various traits of the assault cases like nature of injury, length of stay in hospital, discharge, age cat etc.

		Gender		Total	p value
		Female	Male		
Nature of Injury	Interpersonal assault	104	221	325	<0.01
		20.70%	26.50%	24.30%	
	Robbery	329	525	854	
		65.40%	63.00%	63.90%	
	Others	70	87	157	
		13.90%	10.40%	11.80%	
Outcome	Discharge After Treatment	289	298	487	<0.00
		57.34%	35.70%	36.40%	
	Referred to Higher Centre	147	247	394	
		29.17%	29.60%	29.40%	
	Left Against Medical Advice	68	290	358	
		13.49%	34.70%	34.20%	

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Length of Stay in Days	>72 hours	83	128	211	>0.05
		16.50%	15.30%	15.80%	
	>24-<48 hours	96	141	237	
		19.00%	16.90%	17.70%	
	>48 hours <72 hours	87	130	217	
		17.30%	15.60%	16.20%	
	<24 hours	238	436	674	
		47.20%	52.20%	50.30%	
Age Cat	(0-10) Years	58	102	160	<0.05
		11.50%	12.20%	11.90%	
	(11-18) Years	30	55	85	
		6.00%	6.60%	6.30%	
	(19-35) Years	88	131	219	
		17.50%	15.70%	16.40%	
	(36-50) Years	68	107	175	
		13.50%	12.80%	13.10%	
	(51-65) Years	77	114	191	
		15.30%	13.70%	14.30%	
	(>65) Years	183	326	509	
		36.30%	39.00%	38.00%	
Time of Admission (in 24 hours format)	(00-08) hours, Early Morning	192	321	513	<0.05
		38.10%	38.40%	38.30%	
	(09-14) hours , Day time	111	176	287	
		22.00%	21.10%	21.40%	
	(15-20) hours, Evening time	129	198	327	
		25.60%	23.70%	24.40%	
	(21-23.59) hours, Late night time	72	140	212	
		14.30%	16.80%	15.80%	
	Total	504	835	1339	
		37.65%	62.35%	100%	

Males outnumber females in all assault cases and various categories as per above table.

The majority of instances are associated with robbery, with interpersonal violence and other related offenses following suit.

A considerable number of cases led to release following treatment, with a noteworthy component being left without medical guidance. It is worth mentioning that the majority of female patients were released following treatment, whereas male patients were either referred to higher centers or left without medical advice. A smaller number of cases were referred to a more advanced medical facility. Most instances had a duration of stay of less than 24 hours, with comparable proportions observed across various time intervals. The age category with the biggest number of instances is individuals aged 65 years and above, followed by those aged 24 years and 19-35 years.

The periods of early morning and evening exhibit the highest volume of admissions, with midday and late-night periods following suit. (Table 2)

Table 3. A binary logistic regression analysis looking for significant predictors for knowing various traits which might predict the admission as having assault.

	B	p	Unadjusted Odds Ratio	95% C.I. for Odds ratio	
				Lower	Upper
Age Cat	0.021	0.266	1.021	0.984	1.06
Length of Stay in days	0	0.999	1	0.903	1.108
Time_Of_Admission*	0.004	0.005	0.996	1.987	2.005
Gender*	0.186	0.006	1.205	1.055	1.376
Constant	-1.073	<.001	0.342		

A logistic regression analysis examined the probability of being admitted to the surgery ward for assault cases. Predictors were variables such as Age, Category, Length of Stay in days, Time of Admission, and Gender.

Age category plays a significant role in determining the likelihood of admission to the surgery ward for assault cases. With each increase in age category, there is a corresponding increase in the odds of admission. However this was not statistically significant as p >0.05.

The odds ratio (1) suggests that there is no significant alteration in the odds of admission when the length of stay increases, as indicated by a confidence interval ranging from 0.903 to 1.108.

Upon admission, the p-value of 0.004 reveals a significant effect. With each additional unit of time of admission, there is a slight increase in the odds of admission. The confidence interval suggests that this increase could range from 1.987 to 2.005.

Gender does have the likelihood of admission to the surgery ward for assault cases. p-value suggests that this effect is of high statistical significance. (Table 3)

Discussion

Our study delved into the various factors that impact admission to the surgery ward for victims of assault. We employed logistic regression analysis to gain insights into this matter. Although age category and length of stay did not demonstrate any statistically significant associations with admission, it was found that time of admission and gender played crucial roles as predictors. A first of its kind, this study is indigenous and novel in these parts of the country. The study highlights the various facets and resource limitations existing in our teaching hospital. Good number of referral cases does raise some concern regarding the resource crunch and need of trauma centers in this area of Jharkhand.

Admission Time and Surgical Admissions:

It is consistent with prior research that the likelihood of surgical admission increased when patients are admitted later in the day. Research conducted by Bonatti et al 2008 and Barbara's et al 2010 has revealed that trauma admissions are more likely to occur during off-hours and weekends.[6,7] One possible reason for this could be the presence of experienced surgical staff during regular working hours, which may result in more cautious treatment approaches for less severe injuries outside of these hours. In addition, the nature of assault injuries may necessitate additional evaluation and consultations with specialists, which may be less accessible outside of normal working hours.

Gender based outcomes and Surgical Admissions in Assault Cases:

The significant effect of gender on admission warrants further investigation. While the specific direction of the effect (i.e., which gender has higher odds) wasn't mentioned in the current analysis, exploring this aspect could provide valuable insights. Existing literature offers mixed findings on gender differences in assault-related injuries. Studies like Gannon et al 2002 suggest that males are more likely to sustain severe injuries requiring surgery, while others like Joestl et al 2019 report no significant gender differences in terms of admissions but do say likelihood of death and poor outcomes are more with male being the patients.[8,9] Future studies with larger sample sizes and detailed injury data could shed light on these discrepancies and provide a clearer picture of gender disparities in surgical admissions for assault victims. Extensive reviews by Adil et al

2013 have demonstrated gender and racial parity to play an important roles in trauma cases. In depth studies done in Indian scenario are far and few.[10] More exhaustive studies can shed better light on resource settings allocation and devise better policies for better management.

Strengths: With a focus on a large regional sample, this study examines over 4,000 cases, offering a comprehensive dataset that is specific to the region. By focusing on a regional population, the findings of this study can be more easily applied to other individuals within the same region.

Thorough Examination of Assault Admissions: This study surpasses surface-level admission data and explores the intricacies surrounding assault admissions. By conducting thorough research, a deeper understanding of the factors linked to these admissions can be achieved.

Limitations: Without patient follow-up data, it becomes challenging to evaluate long-term outcomes or recovery trends. Details regarding post-discharge complications or support needs may not be included in the data. There is a possibility of incomplete data due to the reliance on manual data collection, which can result in missing entries or incomplete information. Such factors can introduce bias and restrict the accuracy of analysis.

Conclusion

The study uncovered a disturbingly high rate of admissions resulting from assault, with around 30% of patients being admitted due to injuries sustained from acts of violence. In addition, there was a greater number of male assault victims compared to females. There appears to be a possible requirement for specific interventions to address the susceptibility of males to assault in this particular area.

Rising Demand for Neurosurgical Services: The significant number of referrals to higher centers, possibly due to intracranial injuries, emphasizes the crucial need for easily accessible neurosurgical expertise. Equipping medical colleges with neurosurgeons could enhance access to critical care for these patients.

Conflict of Interest: Nil

Source of funding: Self

Ethical clearance: Taken from IEC, SBMCH, Hazaribag Ref no IEC/16/2024 Dated 06/03/2024.

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