Section: General Surgery

Original Research Article

EPIDEMIOLOGY AND CLINICAL OUTCOMES OF BLUNT ABDOMINAL TRAUMA IN ADULTS IN GOA: AUDIT: FROM A TERTIARY CARE TEACHING INSTITUTE

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Abstract

Background: Blunt abdominal trauma is a common and serious emergency condition, frequently a substantial aspect of polytrauma cases. The objective of this study was to establish a database on the epidemiology and the 30-day mortality rates of patients with blunt abdominal trauma at a tertiary care center and to investigate the factors that influence these outcomes. **Material & Methods:** A prospective study was conducted among 210 patients admitted with blunt abdominal trauma in the Department of General Surgery over a period of 2 years. The primary outcome measure was thirty-day mortality. **Results:** The mean age of the study population was 35 years (SD-13.9). The most common age group affected by blunt trauma was 21-30 years. The overall 30-day mortality was 11.42% (24 cases), with a higher mortality observed in the age group above 60 years. **Conclusion:** Blunt abdominal trauma (BAT) poses a significant public health concern in India. Mortality has been found to be strongly associated with older age, hemodynamic instability, and head injury.

INTRODUCTION

Blunt abdominal trauma is a frequent and critical emergency condition, often constituting a significant component of polytrauma cases.[1] Managing such cases demands high clinical suspicion, thorough investigation, and adequate medical intervention. Despite advancements in imaging techniques facilitating early recognition and treatment, blunt abdominal trauma remains a formidable challenge in the field of trauma medicine, often resulting in high rates of morbidity and mortality.[2,3] Notably, trauma from road traffic accidents and falls stands as the foremost cause of blunt abdominal injuries.[4] This study aimed to create a database on the epidemiological pattern and 30-day mortality of patients presenting with blunt abdominal trauma at a tertiary care centre, as well as to explore the factors influencing these outcomes.

MATERIALS AND METHODS

A prospective study was conducted among 210 patients admitted with blunt abdominal trauma in the Department of General Surgery at Goa Medical College from January 1, 2017, to December 31, 2018. Following initial resuscitative measures, laboratory investigations, and FAST scans, contrast-enhanced computed tomography (CECT) of the abdomen was performed when indicated. The study was approved by the Institutional Ethics Committee (IEC). Mechanisms of injury and details of other injuries were documented. All patients were screened for polytrauma using appropriate imaging techniques. Abdominal solid organ injuries were graded according to the American Association for the Surgery of Trauma (AAST) system. Continuous monitoring of vital signs, Glasgow Coma Scale (GCS), peripheral oxygen saturation (SPO2), clinical examination, and hematocrit levels was carried out. Follow-up ultrasonography was conducted in cases where it was indicated. Study parameters included age, sex, hemodynamic stability at presentation, Focused abdominal sonography for trauma (FAST) results, associated injuries, and ICU admission. The primary outcome measure was thirty-day mortality. P value <0.05 is considered statistically significant. Statistical package for social sciences version-18 (SPSS-18, IBM, Chicago, USA) was used for data analysis.

RESULTS

The study was conducted among 210 patients with blunt abdominal trauma treated in the General Surgery department over 24 months. The mean age of the study population was 35 years(SD-13.9). The most common age group affected by blunt trauma was 21-30 years (68 cases), followed by 31-40 years (59 cases). Males accounted for 96.19% of the total.

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The overall 30-day mortality was 11.42% (24 cases), with a higher mortality observed in the age group above 60 years. Among males, the mortality rate was 11.39%. Eighty-one patients required intensive care unit admission during treatment. The most common mechanism of injury was road traffic accident, followed by falls from height. At the time of presentation, 38.57% of patients had hypotension. Nineteen patients experienced hollow viscus perforation. Blunt trauma solid organ injury was observed in 39% of cases, and 53.8% had associated blunt trauma to the thorax. Twenty-seven patients had head injuries. Baseline characteristics of the study population and their relation to clinical outcomes are depicted in Table 1. Among various parameters, age, hypotension at presentation, and head injury showed a statistically significant association with mortality.

Table 1: Distribution of patient characteristics with 30-day outcome

Parameter	N	30 -day Outcome		p-value
	210	Survival (N=186; 88.58%)	Mortality (N=24; 11.42%)	
Age				0.001
<20	25(11.91)	23(92)	2(8)	
21-30	68(32.40)	64(94.12)	4(5.88)	
31-40	59(28.09)	56(94.92)	3(5.08)	
41-50	34(16.20)	30(88.24)	4(11.76)	
51-60	16(7.60)	10(62.5)	6(37.5)	
>60	8(3.80)	3(37.5)	5(62.5)	
Sex				0.923
Male	202(96.20)	179(88.61)	23(11.39)	
Female	8(3.8)	7(87.5)	1(12.5)	
Mechanism of Injury				
Road Traffic Accident	170(80.95)	153(90)	17(10)	
Fall from height	22(10.47)	15(68.18)	7(31.82)	
Direct blow	18(8.58)	18(100)	0	
Hypotension at admission				0.001
No	129(61.43)	126(97.67)	3(2.33)	
Yes	81(38.57)	60(74.07)	21(25.93)	
FAST				0.054
Negative	46(21.90)	45(97.83)	1(2.17)	
Positive	164(78.10)	141(85.97)	23(14.03)	
Hollow viscus perforation				0.998
No	191(90.95)	167(87.43)	24(12.57)	
Yes	19(9.05)	19(100)	0	
Solid Organ Injury				0.543
No	128(60.95)	112(87.5)	16(12.5)	
Yes	82(39.05)	74(90.2)	8(9.8)	
Blunt Trauma chest				0.366
No	97(46.19)	88(90.72)	9(9.28)	
Yes	113(53.81)	98(86.73)	15(13.27)	
Head Injury				<0.000
No	183(87.14)	169(92.35)	14(7.65)	
Yes	27(12.86)	17(62.96)	10(37.04)	
Spine Injury				0.041
No	191(90.95)	172(90.05)	19(9.95)	
Yes	19(9.05)	14(73.68)	5(26.32)	
Limb Fracture				0.753
No	170(80.95)	150(88.23)	20(11.77)	
Yes	40(19.05)	36(90)	4(10)	
Blood Transfusion				<0.001
No	121(57.62)	118(97.52)	3(2.48)	
Yes	89(42.38)	68(76.40)	21(23.60)	
Organs affected				0.632
Liver	31(14.76)	27(87.09)	4(12.91)	
Spleen	39(18.57)	37(94.87)	2(5.13)	
Pancreas	3(1.43)	2(66.67)	1(33.33)	
Kidney	9(4.23)	9(100)	0	
2 ≥ Solid organs	11(5.24)	10(90.90)	1(9.10)	
Management				0.056
Non Operative	143(68.09)	132(92.31)	11(7.69)	
Operative	67(31.91)	54(80.60)	13(19.4)	

[N-Number, FAST - Focused Assessment with Sonography in Trauma]

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DISCUSSION

Abdominal injuries manifest in around 1% of trauma cases, with abdominal organ injuries alone accounting for 10% of trauma-related deaths. These injuries can either present independently or as part of a polytrauma.[4,5] The 30-day mortality rate was 11.43% (24 out of 210 cases). Among these, 50% were in the 30–50 years age group, while 62% (5 out of 8) of patients aged above 60 years succumbed to their illnesses. Studies indicate that advanced age raises the mortality rate to over 50%. Older age correlates with diminished organ function and a higher prevalence of co-morbidities, contributing to increased mortality.[1,3,6] Overall, recent literature indicates that the mortality rate for blunt abdominal trauma in India ranges from 11% to 17%.[7,8] However, this rate can vary based on individual cases and the availability of resources. Improving access to advanced trauma care and resources in Goa could have a significant impact on reducing the mortality rate.

The most common mechanism of blunt abdominal trauma in the present study was road traffic accident, which was similar to those reported in the literature.[1,5] In the present study, 34 (68%) underwent conservative management, while 67 (32%) underwent operative intervention. Our results are consistent with Mohapatra et al., who reported a laparotomy rate of 39% in their series.[8,9]

In cases of abdominal trauma, there is a potential association with additional co-morbid injuries, complicating the management process and impacting overall outcomes. Gad et al.'s study highlighted skeletal injuries as the most common accompanying injuries, with chest injuries following closely. Similarly, within this group, 9% had limb fractures, and 9% had spine injuries.[10]

In our findings, the spleen emerged as the organ most frequently injured, in contrast to other series that highlighted the liver as the predominant site of injury.[11-13] An important finding from the current study is the association of hemodynamic instability with outcome. Almost one-third of the patients presented with hemodynamic instability, marked by hypotension.[14-16]

A timely and precise diagnosis of blunt trauma abdomen (BTA) is vital for optimal patient outcomes. In India, limited awareness, restricted access to pre-hospital care, insufficient resources, and high costs for advanced diagnostics hinder effective BTA management. Overcoming these challenges is crucial to improving BTA care and minimizing associated morbidity and mortality in the country.

CONCLUSION

Blunt abdominal trauma (BAT) stands as a significant public health concern in India. However, recent strides in BAT management reflect noteworthy progress, promising an improved prognosis for afflicted individuals. A comprehensive understanding of these advancements is pivotal for optimizing patient care and mitigating the trauma-induced morbidity and mortality burden. Systematic research in this domain remains imperative for the continual refinement of blunt abdominal trauma management protocols, thereby fostering advancements in trauma care within the healthcare paradigm.

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Authors' Contribution

AK: study design, Data analysis and interpretation, drafting the article, Final approval of the version. RS: Conception and study design, Critical revision of the article, Final approval of the version. RH: drafting the article, Critical revision of the article, **Final approval of the version AV:** Critical revision of the article, Final approval of the version

Ethical Approval

The Institutional Ethics Committee of Goa Medical College approved the study protocol.

Competing interests: None

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