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Abbreviated Injury Scale and Management of Abdominal Organ Injuries in Trauma Patients

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Abstract: ***Aim of this study was to study the clinical importance of Abbreviated Injury Scale in the management of abdominal organ injuries in trauma patients. This study was conducted in department of general surgery, Dr. S. N. Medical College, Jodhpur, Rajasthan between duration of 1 year (2017-2018). Study included 78 patients. In this study RTA was the most common mode of injury. The solid organ injuries were more commonly involved than hollow viscus injuries. In our study, chest injuries were the most common observed concomitant extra–abdominal injuries followed by the extremities, head and spine injuries. In this study, maximum number of patients were with AIS score of 2, second highest being with AIS score 3. Maximum average duration of hospital stay was seen with AIS score of 5 and with score 4.Above results indicates that AIS score for any organ injury have a significant impact on the clinical presentation, management and outcome of any injury.Further studies are required prove either these results are significant or merely coincidental.***

Keywords: Abbreviated Injury Scale, polytrauma, abdomen, RTA

1. Introduction

The word Polytrauma is a Greek word meaning poly (much) trauma (damage, injury or wound) which are caused by force together. Over 90% of polytrauma results from blunt injuries and traffic accidents forms the most frequent cause of trauma.Abdominal trauma is the leading cause of morbidity and mortality in all age group world wide[1].Missed intra-abdominal injury or concealed hemorrhage are frequent cause of increased morbidity and mortality, especially in patient who survives the initially phase of an injury[2].

When head and blunt abdominal injuries arecombined, the head Injuryisoften afforded toomuch attention and the abdominal injury too little, especially when the patient is unconscious. If mismanaged, the abdominal injury is often the more serious threat to life.

The Abbreviated Injury Scale (AIS) is an anatomically based consensus derived global severity scoring system that classifies each injury in every body region according to its relative severity on a six-point ordinal scale[3]. The ordinal scale 1–6 used to characterize the severity of the injury which is simply a means of distinguishing between categories of injuries within a similar range of severity[4].The AIS severity scale is as follows 1.Minor, 2.Moderate, 3.Serious, 4.Severe, 5.Critical and 6.Maximal (currently untreatable).

2. Material and Methods

A Prospective study on "the role of Abbreviated Injury Scale in the management of abdominal organ injuries in trauma patients" was conducted on patients admitted in surgical units of Mathura Das Mathur Hospital, Jodhpur from January 2017 to December 2018.

Selection criteria of patient

- Patients of both sexes having abdominal injury surviving for more than 24 hours of admission.
- Children below age of 12 are not involved in this study.
- Patients who come under the following modes of injury: fall from height, road traffic accidents, assault and occupational injuries.

3. Observation and Discussion

Patients between age 15-30 yrs. were most commonly affected with males predominantly affected. RTA was the most common mode of injury followed by fall from height. This correlates with the results of the study done on patients admitted at Muhimbili Medical Centre Dar es Salaam between January 1987 and December 1990.

Table I: Organ Involved

Types	No. Of cases	Percentages
Liver	37	47.43
Spleen	16	20.51
Ileum	04	5.12
Jejunum	14	17.94
Sigmoid	01	1.28
Liver & Spleen	03	3.84
Others	03	3.84
Total	78	100%

Solid organs were most commonly injured accounting for 71% of the cases as compared to hollow viscous which accounts for 28% of the cases. In solid organs injury, liver was most commonly injured organ with 37 cases (47%) with spleen ranked second with 16 cases (20%). Liver and spleen both were involved in 3 cases (4%) (Table I).Several other studies have reported liver to be the most common injured solid organ followed by spleen in blunt trauma abdomen[5],[6],[7].

In hollow viscous, jejunum is the most commonly injured with 14 cases (17%) followed by ileum (5%) and sigmoid (1%).Overall liver is the most common organ injured in case of abdominal organ injury in trauma patients accounting for 47% of the cases followed by spleen (20%) and jejunum (17%).

Most commonly associated extra abdominal injury in a case of trauma patient is chest injury accounting for 44% of the cases, second being extremity with 25% of the cases (Fig. I). Head injury accounting for 16% of the cases and spine injury 15% of the cases.Similarly, Mohamed et al. from Saudi Arabia reported chest and head injury to be most

frequently associated extra-abdominal in polytrauma patients[8].

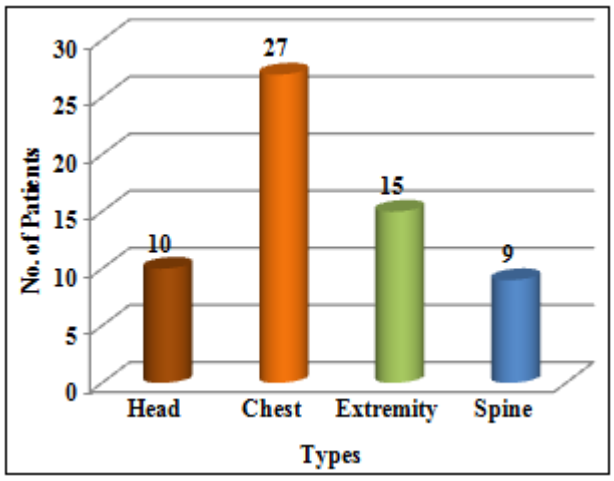

Figure I: Associated extra abdominal organ injury (polytrauma)

Table II: AIS score and number of patients

AIS score	No. of patients	Percentage
1	4	5.12
2	36	46.15
3	26	33.33
4	7	8.9
5	3	3.8
6	2	2.5
Total	78	100

Patients with AIS score 2 accounts for max number of cases in trauma patients, that are 36 cases (46%) (Table II). AIS score 3 ranked second with 26 cases (33%) and AIS score 4 being third in the list with 7 cases (9%).

Out of 4 patients with AIS score, 1 was managed conservatively and rest were operated. Out of 36 patients with AIS score 2, 22 were managed conservatively, whereas out of 26 patients with AIS score 3, 16 were managed conservatively. Out of 7 patients with AIS score 4, one was managed conservatively, whereas none of the patients with AIS score 5 and 6 were managed conservatively (Table III). Maximum incidence of surgical intervention was seen with AIS score 6 and 5, which signifies severity of trauma in these patients.

Table III: Correlation between AIS score and hospital stay

AIS score	Hospital stay	Non conservative	No. of Conservative cases	P value
1	04 (7.25±1.70)	03	01 (5.0±0.00)	NA
2	36 (8.27±3.64)	14	22 (7.31±2.31)	0.273
3	26 (8.30±3.12)	10	16 (8.43±2.52)	0.888
4	07 (10.71±4.49)	06	01 (4.0±0.00)	NA
5	03(11.66±10.50)	03	00	NA
6	02 (6.0±5.65)	02	00	NA
Total	78 (8.52±3.91)	37	41 (7.62±2.48)	

In our study, maximum average duration of hospital stay was seen with AIS score of 5 (11.66 days) and with score 4 (10.71) days, this attributes to the increased severity of disease in these patients, these high values were due to the fact that there was higher incidence of operative intervention in these cases thus demanding longer duration of hospital stay (Table IV). Least duration of hospital stay was seen with AIS score 6 (6 days), this low value is because of the fact that in these patients there was 50% mortality and that too occurred within first 5 days of the admission.

Out of 4 patients with AIS score of 4, all 4 were discharged. Whereas out of 36 patients with AIS score 36, 34 were discharged and 2 expired. Out of 26 patients with AIS score of 3, 22 were discharged and 4 were expired. Out of 7 patients with AIS score of 4, all 7 were discharged. Out of 3 patients with AIS score of 5, 2 were discharged and one expired and of 2 patients with AIS score 6, one was discharged and one expired. Maximum mortality percentage was seen with AIS score of 6 followed by 5 which signify disease severity (Fig. II).

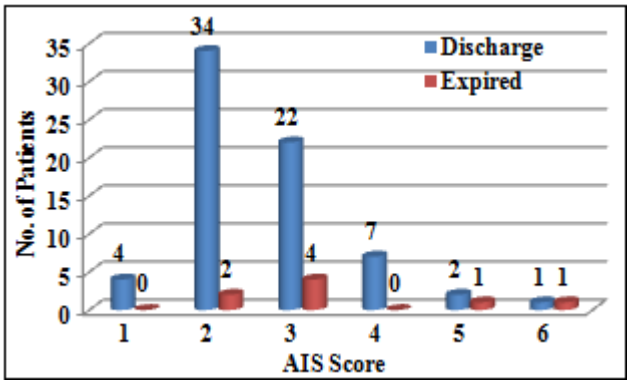

Figure 2: Correlation between AIS score with outcome

In our study, among 8 patient expired, 2 were having associated head injury and chest injury, other 2 were having associated chest and vertebrae injury and 2 were having associated extremity injury apart from chest and vertebrae injury. These results suggest that concomitant head injury was associated with high mortality. Especially, the high probability of adverse outcome due to combined abdominal injuries and chest trauma in our and other studies[9],[10] should be taken into account during the early management of polytrauma patients.

4. Conclusion

Over all study concludes that AIS score for any organ injury have a significant impact on the clinical presentation, management and outcome of any injury.We come to conclusion that AIS score should be used by clinicians routinely to improve the results of trauma.

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