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Epidemiological Study of Abdominal Trauma in a Tertiary Care Hospital in a Hill State of Northern India.

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ABSTRACT

Objective: Abdominal Trauma in India is an important entity with an increasing importance due to rapid development and increasing motorization. Millions of lives are lost each year due to this global pandemic .The aim of the study is to assess the epidemiological profile of abdominal trauma patients in a state run tertiary care hospital, IGMC Shimla in Himachal Pradesh in Northern India.

Methods: An observational study was carried out on the data for a period of 1 year (Nov. 2015 to Nov. 2016) for abdominal trauma patients presenting in IGMC Shimla. Demographic and Injury patterns were observed in the patients admitted in Emergency department along with their individual treatments.

Results: A total of 98 patients who had sustained abdominal injuries were included in the study and their data was analysed. Abdominal injuries occurred most frequently in the age group of 21 to 30 years (24.4%) .There was a marked male preponderance (72.4%). The most common organs injured were Spleen (33.67%) followed by Liver (32.65%), kidney (8.16%) and gastrointestinal tract (11.22%). In this study, most common causes of abdominal trauma were road traffic accidents (48.98%), fall from height (48.98%) and assault (2.04%).

Conclusion: Abdominal trauma is major cause of morbidity and mortality. Road traffic accidents and falls are the major causes. Road safety measures and infrastructure development in hilly states may decrease the disease burden from this global pandemic.

Keywords: Road traffic accidents (RTA), Epidemiology, Blunt Abdominal trauma.

I. INTRODUCTION:

Trauma is a major public health problem with an increasing incidence and prevalence. Abdominal trauma accounts for a large number of preventable morbidity and mortality. Most of the victims are of younger age group[1] and are in productive years of their lives therefore highlighting its importance in present day scenario. It fulfils the criteria as a global pandemic with a significant morbidity and mortality[2].

Trauma is pandemic with India being the epicentre due to the second largest population. The progressive rise in the incidence is mainly due to rapid development, increasing motorization, poor safety standards and traffic. According to the World Health Organization, the number of deaths due to road traffic accidents (RTAs) is expected to rise to 2.34 million in 2020 around the world [3]. In India, nearly 80,000 people get killed every year in about 300,000 road traffic accidents on the road. There is an accident every minute and death every 8 minutes[4, 5]. The abdomen is injured in about one third of the cases[6] of road traffic accidents.

Abdominal trauma remains a challenge due to the vital organs contained in it. Often associated with polytrauma, the intra abdominal organs may bleed or perforate causing instant death, or may require surgical interventions, medical treatment and hospital care to prevent mortality and morbidity.

Studying the demography, mode and injury patterns is essential to for resource management and infrastructure planning for the state.

Trauma in Himachal Pradesh is a major problem causing loss of human lives. The hilly terrain, narrow roads, overcrowded public transport system, poor road maintenance, alcohol and drug abuse and poor road safety standards are the main reason.

The aim of the study was to analyse the epidemiology of abdominal trauma in a comprehensive manner and provide a database in tertiary care hospital in the hill state of Himachal Pradesh.

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II. MATERIAL AND METHODS

The study was an observational study conducted at Indira Gandhi Medical College Shimla in Himachal Pradesh over a period of 1 year from November 2015 to November 2016. A total of 98 abdominal trauma patients attended the Emergency Department and were subsequently admitted and managed in Department of Surgery IGMC Shimla .Their records were retrieved from record section and analysed. A detailed observation regarding the demographic variables, mode of abdominal injuries, abdominal organ associated with chest injuries, investigations including ultrasound, X – Ray, CT Scan findings and treatment given was recorded and analysed.

III. RESULTS

A total of 98 patients were included in this study who presented in emergency in IGMC Shimla with abdominal trauma. The patients were predominantly male and the age of the victims in present study varied from 4 to 76 years. The peak incidence was observed in the age group of 21-30 years comprising 24.49% of the cases.

Table 1 shows the demographic pattern of the population under study. The majority of victims, 71 (72.45%) were males.

Table 1: Demographic Characteristics

Age Group	No .of patients (%)
< 10	18(18.37%)
11-20	18(18.37%)
21-30	24(24.49%)
31-40	18(18.37%)
41-50	16(16.33%)
51-60	3 (3.06%)
61-70	0
71-80	1 (1.02%)
Sex	No .of patients (%)
Male	71 (72.45%).
Female	27(27.55%)

The mode of the injury was found to be Road Traffic Accidents (48.98%), falls (48.98%) and assault (2.04%).

Table 2: Modes of Injuries.

Mode of Injury	No. of Patients (%)
Road Traffic Accidents	48(48.98%)
Fall from height	48(48.98%)
Assault	2 (2.04%)

The most common organ injured was Spleen, 33 (33.67%) followed by liver, 32 (32.65%), gastrointestinal tract perforation 11(11.22%) which included 1 gastric perforation and 10 small gut perforations, Kidney 8 (8.16%) and isolated hemoperitoneum without identifiable visceral organ injury occurred in15 (15.3%) cases. Rib fractures in association with liver injuries was found in9 (9.18%) , with splenic injuries in 5 (5.1 %) and with renal trauma was found in 2 (2.04%) cases .Multiple intra abdominal organ injury was present in 15(15.3%) cases.

Table 3: Distribution of abdominal organ injuries.

Organ Injured	No .of patients (%)
Spleen	33(33.67%)
Liver	32(32.65%)
Small Gut	10(10.2%)
Stomach	1(1.02%)
Kidney	8(8.16%)
Hemoperitoneum (without detectable organ injury)	15(15.3%)

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Associated rib fractures with liver injury were detected in 9 cases, with splenic injury in 5 and with renal trauma in 2 cases. Therefore rib fractures occurred with liver, spleen, kidney injury in 28.1%, 15.2% and 25% of the cases respectively.

Conservative treatment was the mainstay of treatment in 78(79.6 %) and operative treatment was required in 20(20.4%) patients.

Table 4: Treatment modality.

Treatment modality.	No. of patients
Conservative Management	78(79.6 %)
Operative Management	20(20.4%)

IV. DISCUSSION

India is a rapidly developing country with an increasing rate of abdominal trauma. Abdominal trauma is an important entity due to the vital structures it contains and abdomen is the third most frequently injured region of the body [6]. Hilly terrains like in Himachal Pradesh have higher rates of RTA and abdominal trauma and ranks in top 10 states in the country in terms of road traffic accidents (RTA) deaths per lakh population[7]. However in this study RTA and falls had an equal incidence causing abdominal trauma .This is partly due to the hilly terrain, narrow paths, snowfall and outdoor farming work done in this mostly hilly state with more than 90% rural population[8].

This epidemiological study was conducted with an aim to study the demographic pattern, various modes of abdominal trauma in patients of this tertiary care hospital. Most of the victims are of younger age group [9] between 21 to 30 years as found in our study and are in productive years of their lives therefore highlighting its importance in present day scenario. The highest incidence in this age group can be attributed to the active lifestyle of this age group with highest exposure to external environment, increased vehicular traffic, working outdoors in the state.

Male patients exceeded in numbers compared to females in our study. The male: female ratio observed in our study was about 2.5:1. In a study conducted by Ganveer and Tiwari in 2005, they found male to be involved in RTA 6 times more commonly than females[10]. The predominance of the males is due to greater exposure to external environment, vehicles, machinery, alcohol and more outdoor activities.

The commonest mode of injury in our study was road traffic accidents along with falls in equal proportions. This is in contrast to the other previous studies that have a higher proportion of injuries due to RTA[11,12,13,14].

The high altitude terrain, snowfall in winters and farming activities like pruning of orchards, collection of grass and fodder for the livestock make the inhabitants of this region susceptible to falls from tree, gorges and heights especially in the villages.

Assault cases form the smallest subset of cases (2.04%) in this relatively peaceful state of India.

In our study the initial evaluation of abdominal trauma was done with X- Ray chest and abdomen, ultrasound (FAST) and CECT abdomen in indicated patients. Free air(pneumoperitoneum) was detected on X -rays in 9 patients out of 11 patients of GIT perforations and were operated thereafter. Hemoperitoeum was detected in 15 (15.3%) patients without any other detectable visceral injury on CECT abdomen. Spleen was commonest organ injured in 33(33.67%) cases and was associated with left lower rib fractures in 15.2% cases. Splenorrhaphy was done in 2 case of splenic tear with gross hemoperitoneum and splenectomy was done in 3 cases with grade 4 splenic injury with hypovolemic shock .Liver was the second most common injured viscera in32 (32.65%) cases and was associated with right lower rib fractures in 28.1% cases. Small gut perforation was found in 10(10.2%) cases and one patient had Gastric perforation due to penetrating injury. An incidence of 6.2% was found in a similar study by Tonge et al. in RTA with gut injury[15.] Kidney trauma was found in 8(8.16%). In a study by Mausami et al in 2007-2008 of 55 cases Kidney was injured in 10.9%cases[16]. Multiple intra abdominal visceral injury was present in 15 (15.3%) cases. In a study by Malhotra P et al. the incidence of multi organ injury in abdominal trauma was 20%[17].

Conservative treatment was successful in most of the patients with solid organ injuries with hemodynamic stability. However, hollow viscus perforation required aggressive resuscitation and operative management.

Delay in diagnosis, resuscitation, treatment and respiratory complications increase the morbidity and mortality.

V. CONCLUSION:

Abdominal trauma in Himachal Pradesh is a major problem causing loss of human lives. The hilly terrain, narrow roads, overcrowded public transport system, poor road maintenance, alcohol and drug abuse and poor road safety standards are the main reason.

Road traffic accident and fall from height are the most common causes of abdominal trauma, spleen and liver being the most commonly injured organ followed by gut and kidney. A high incidence of abdominal trauma due to falls is observed in this study.

Early diagnosis, resuscitation and prompt treatment will help in reducing the morbidity and mortality associated with abdominal trauma.

Social awareness regarding traffic safety, road maintenance, and infrastructure development in the health sector, establishment of trauma centres in the peripheral region will be of great benefit in this hilly state as it will save lives and decrease the burden on the tertiary institutes.

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Conflicts of interest
There are no conflicts of interest.

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