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ORIGINAL ARTICLE

Study of Spleen and Liver Injuries in Patients of Blunt Trauma Abdomen

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ABSTRACT

Objective: To study the spleen and liver injuries in patients of blunt trauma abdomen.

Material and methods: This was a cross sectional study which conducted at Department of Surgery Loralai Medical College Loralai from May 2021 to November 2021 over the period of 6 months. Total 130 patients aged 18-50 years either gender with blunt trauma abdomen were recruited for this study. Spleen and liver injuries and their grading was studied.

Results: Total 130 patients of blunt abdominal trauma were recruited. Age range was 18-50 years with mean age 30.85 ± 8.84 years. Out of 130 patients, liver injury was found in 67 (52%) patients. Total 84 (65%) patients had spleen injury. Total 20 (15%) patients had both liver and spleen injury.

Conclusion: Results of this study concluded that spleen was the most common injured organ. Grade-I liver and spleen injury was commonly seen. Age group 18-33 years was common age group and males were prominent than females.

Keywords: trauma, abdomen, liver, spleen

INTRODUCTION

Trauma is defined as bodily harm caused by an energy exchange with the environment that exceeds the body's ability to withstand it.[1] Globally, among under 50 years individuals, trauma is main cause of mortality and morbidity.[2] The abdomen is one of the most usually damaged body areas due to its large surface area.[3] The liver and spleen are the most typically injured organs in those who have had a forceful abdominal trauma and haemoperitoneum, especially in their second and third decades of life.[4] In human body, the biggest organ is liver which weighing about 1500 grams. It is protected by the rib cage and is placed beneath the diaphragm in the right upper abdominal cavity.[5] Physical trauma causes the vast majority of liver damage. Compressive stresses between the force and the rib cage or vertebral column might easily cause the liver to rupture because it is solid.[6] The spleen is situated between the stomach fundus and the diaphragm, beneath the protection of the 9th, 10th, and 11th ribs, and its long axis is aligned with the 10th rib.[7] Direct physical trauma to the spleen; direct energy applied to the lower ribs frequently harms the spleen (9th to 11th ribs).[6] Liver injury is the most common (40%) intra-abdominal solid organ injury associated with rib fracture, followed by spleen injury (20%).[8] Patients who had more than six rib fractures had a considerably higher rate of intra-abdominal solid organ injury that necessitated emergency surgery, up to 51%.[9]

MATERIAL AND METHODS

This was a cross sectional study which conducted at Department of Surgery Loralai Medical College Loralai from May 2021 to November 2021 over the period of 6 months. Total 130 patients aged 18-50 years either gender with blunt trauma abdomen were recruited for this study. All the cases who were managed non-operatively, cases of penetrating abdominal injury, injuries of natural disaster and cases of ASA-IV or above were excluded. All the cases were managed with exploratory laparotomy and spleen and liver and their grading was noted on proforma. Liver and spleen injury is defined as wound or hematoma and bleeding is seen on spleen and liver.

SPSS version 20 was used to analyze the data. Age was presented as mean and SD while categorical data was presented in form of frequencies.

RESULTS

Total 130 patients of blunt abdominal trauma were recruited. Age range was 18-50 years with mean age 30.85 ± 8.84 years.

Out of 130 patients, liver injury was seen in 67 (52%) patients. (Fig. 1)

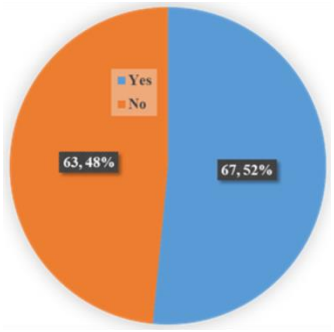

Fig 1: Frequency of liver injury

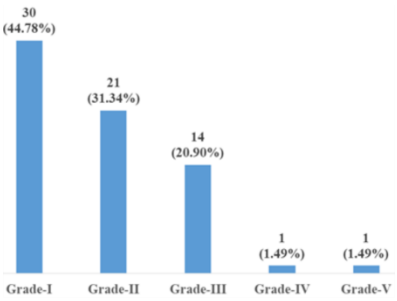

Fig 2: Grades of liver injury

Regarding grades of liver injury, grade I, II, III, IV and V injuries were found in 30 (44.78%) patients, 21 (31.34%), 14 (20.90%), 1 (1.49%) and 1 (1.49%) patients respectively. (Fig. 2)

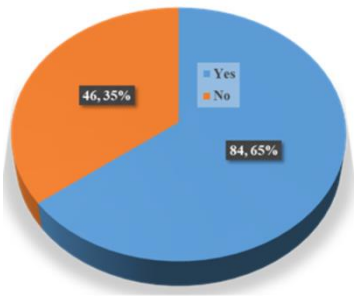

Fig 3: Frequency of spleen injury

Total 84 (65%) patients had spleen injury. (Fig. 3)

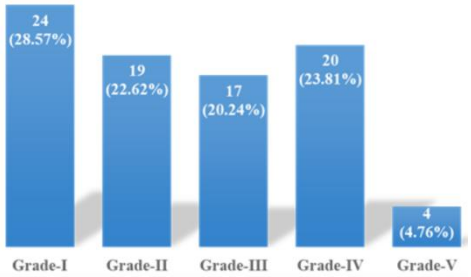

Fig 4: Grades of spleen injury

Regarding grades of spleen injury, grade I, II, III, IV and V injuries were found in 24 (28.57%) patients, 19 (22.62%), 17 (20.24%), 20 (23.81%) and 4 (4.76%) patients respectively. (Fig. 4)

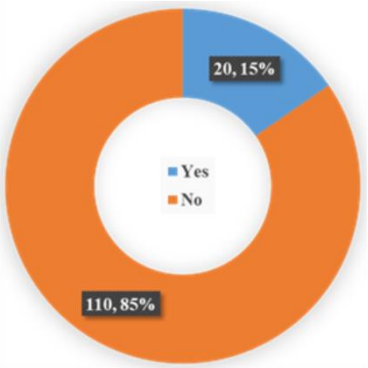

Fig 5: Frequency of both spleen and liver injury

Total 20 (15%) patients had both spleen and liver injury. (Fig. 5)

Table 1: Association of liver injury with age and gender

Variable	Liver injury		Total (%)	P value
	Yes (%)	No (%)		
Age groups				
18-33	41 (51.25%)	39 (48.75%)	80 (61.54%)	0.934
34-50	26 (52%)	24 (48%)	50 (38.46%)	
Gender				
Male	51 (53.12%)	45 (46.88%)	96 (73.85%)	0.543
Female	16 (47.06%)	18 (52.94%)	34 (26.15%)	

Two age groups 18-33 years and 34-50 years were created. Age group 18-33 years was consisted on 80 (61.54%) patients while age group 34-50 years was consisted on 50 (38.46%) patients. Liver injury was seen in 41 (51.25%) patients of age group 18-33 years and in 26 (52%) patients of age group 34-50 years. But association between age group and liver injury was insignificant (P = 0.934). Male patients were 96 (73.85%) while female patients were 34 (26.15%). Liver injury was found in 51 (53.12%) male patients and in 16 (47.06%) female patients. But association between gender and liver injury was not significant (P = 0.543). (Table 1)

Table 2: Association of spleen injury with age and gender

Variable	Spleen injury		Total (%)	P value
	Yes (%)	No (%)		
Age groups				
18-33	52 (65%)	28 (35%)	80 (61.54%)	0.908
34-50	32 (64%)	18 (36%)	50 (38.46%)	
Gender				
Male	63 (65.63%)	33 (34.37%)	96 (73.85%)	0.686
Female	21 (61.76%)	13 (38.24%)	34 (26.15%)	

Spleen was injured among 52 (65%) patients and 32 (64%) patients of age group 18-33 years and age group 34-50 years respectively. Insignificant (P = 0.908) association between age group and spleen injury was noted. Total 63 (65.63%) male patients and 21 (61.76%) female patients had spleen injury. But association between gender and spleen injury was not significant (P = 0.686). (Table 2)

DISCUSSION

The purpose of present study was to evaluate the spleen and liver injuries in cases of blunt abdominal trauma. Total 130 patients of blunt abdominal trauma were recruited. Age range was 18-50 years with mean age 30.85 ± 8.84 years. Arumugam et al[10] reported mean age of patients of blunt trauma abdomen as 30.6 ± 13 years. In their study males are more (93%) victim of blunt abdomen trauma as compared to females. Liver and spleen was found injured in 36% patients and 32% patients. But in our study male patients were 96 (73.85%) while female patients were 34 (26.15%). In our study liver injury was found in 67 (52%) patients while 84 (65%) patients had spleen injury. In study of Mufti et al[11], mean age of cases was 27 years which is in agreement with our study. Khan et al[12] conducted a descriptive study in Jinnah Hospital Lahore, they choose 100 cases of blunt trauma abdomen. Age range was 12-70 years. Total 35% cases found with liver injury while 32% patients had spleen injury. Total 42.85 cases found with grade-I liver injury followed by 28.35% cases found with grade-II liver injury and 22.85% cases found with grade-III liver injury. While in our study, grade-I liver injury was seen in 30 (44.78%) patients followed by grade-II in 21 (31.34%) patients, grade-III in 14 (20.90%) patients, grade-IV in 1 (1.49%) patients and grade-V injury in 1 (1.49%) patient. El-Menyar et al[13] recruited 504 patients of blunt abdomen trauma. They found liver injury in 45% patients while spleen injury in 30% patients. Afifi et al[14] found in their retrospective study liver injury in 38% patients, grade-I liver injury was noted in 28.8% patients followed by grade-II in 44.7% patients, grade-III in 19.1%, grade-IV in 7% patients and grade-V in 0.4% patients. Chandel et al[15] recruited 81 patients of blunt abdominal trauma. Total 37.34% patients had liver injury (grade-I injury in 19.4% patients, grade-II injury in 22.6% patients, grade-III injury in 35.5% patient, grade-IV injury in 19.4% patients and grade-V injury in 3.2% patients. In study of Saaiq et al[16] mean age of the patients of blunt abdominal trauma was 34.8±9.7 years, males were 80.5% while females were 19.4%. They recruited 113 cases of liver trauma of which 32.7% patients had grade-I injury followed by 36.2% had grade-II injury, 25.6% had grade-III injury and 6.1% patients with grade-IV injury. Al-Busaidi et al[17] recruited 768 patients of blunt abdominal trauma, mean age of the patients was 36 years, 5.6% patients had splenic injury. Grade-I and II were the most common grades of splenic injury. In study of Aziz et al[18] males were 82% and females were 18%, total 30% patients had injury of liver while 26% patients had spleen injury. Raza et al[19] found splenic injury in 29.8% patients. In studies of Najfi et al[20] and Ghazanfar et al[21] total 18.5% and 23% patients had splenic injury. In another study by Renzulli et al[22], total 20.95% cases had grade-I spleen injury, 25.2% patients had grade-II injury, 29.1% cases had grade-III injury, 20.4% cases had grade-IV injury and 4.4% patients had grade-V injury.

CONCLUSION

Results of this study concluded that spleen was the most common injured organ. Grade-I liver and spleen injury was commonly seen. Age group 18-33 years was common age group and males were prominent than females.

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