

**Research Article**

**Assessment of injured intra-abdominal organs associated to abdominal trauma**

**<sup>1</sup>Attia Rabail, <sup>2</sup>Hafiz Muhammad Junaid  
and <sup>3</sup>Aamna Javed**

<sup>1</sup>Woman Medical Officer, DHQ Hospital Faisalabad

<sup>2</sup>Medical Officer, BHUBheraj Tehsil and District Gujrat

<sup>3</sup>Woman Medical Officer, BHU Dhorī Tehsil Bhalwal District Sargodha

**ABSTRACT**

**Objective:** To assess the injured intra-abdominal organs associated to abdominal trauma

**Methodology:** It was a cross sectional study and conducted at Department of Surgery, DQH Hospital, Faisalabad from January 2017 to June 2017. Total 110 patients with history of blunt trauma abdomen and undergoing exploratory laparotomy were included in the study.

**Results:** Total 110 subjects having history of blunt trauma abdomen were enrolled. The mean age of subjects was  $36.11 \pm 12.57$  years. Males were 92 (83.64%), the females were 18 (16.36%). Total 64 (58.18%) subjects suffered from Road Accidents, 29 (26.36%) suffered from fall from height and 17 (15.46%) found with history of physical assault. Pancreas was injured in 28 (25.45%), Duodenum in 30 (27.27%), Kidney in 34 (30.91%) and 18 (16.36%) had pancreato-duodenal injuries.

**Conclusion:** In this study road accidents were the most common cause of blunt abdominal trauma and most of the subjects were found with injury of kidney. This study highlights the need for prioritizing a public health approach to abide by traffic laws and violence prevention in Pakistan. Results of this study also reveals that male subjects were more victim of blunt abdominal trauma as compare to female subjects and age group 12-35 years was the most common age group of cases with blunt abdominal trauma.

**Key words:** Blunt Trauma. Retroperitoneal Organs. Road Traffic Accidents. Laparotomy.

**INTRODUCTION**

Abdominal trauma is the big general health issue and it is the commonest cause of mortality and the morbidity, in spite of the level of financial development.<sup>1</sup> Trauma is accounted for to be the main reason for death, prolonged hospital stay, and disabilities.<sup>2</sup> Internationally it is found 33% and also remains a stressful reason for unnecessary death. Abdomen is helpless against damage since there is negligible protection of bones for internal organs. In creating nations including Tanzania, trauma is common and abdominal trauma specifically is expanding at a

quick rate because of increment in urbanization, mechanization, civil violence, wars and criminal performance.<sup>3</sup> The etiological range and trauma mechanism have been noted for in literature different from place to place of world due to varieties in communication, violence and crime.<sup>4</sup> Trauma of the abdomen is usually categorized as moreover blunt or penetrating.<sup>1</sup> Most essential causes behind the increment of mortality due to blunt trauma of abdomen is moreover interruption in right time diagnostic evaluation or not proper diagnosis.<sup>5</sup> Most basic reasons for blunt trauma of

abdomen are RTA, falls and industrial events.<sup>5</sup> In the literature RTA represented 83.6% of blunt trauma of abdomen as well as vehicles 45.5% and bike accident 38.1%,<sup>6</sup> and death ratio is greater in cases having blunt trauma as compare to penetrating due to the absence of the complete early diagnosis and appropriate management. It is quietly hard to determine a patient having internal injuries of abdomen light of the fact that examination of the abdomen does not dependably order in cases having internal injuries of abdomen.<sup>7</sup> Incidence of internal injuries of abdomen among patients with trauma of abdomen is around 13%.<sup>8</sup> The spleen was most ordinarily injured due blunt trauma of abdomen happening in above than 50% of patients.<sup>9</sup> On other hand few studies demonstrated that Hepatic injuries were most common associated to blunt trauma of abdomen.<sup>10</sup> This study was carried out to evaluate the frequency of injured intra-abdominal organs associated to abdominal trauma.

#### MATERIAL AND METHODS:

It was a cross sectional study and conducted at Department of Surgery, DQH Hospital, Faisalabad from January 2017 to June 2017. Total 110 consecutive cases sustaining blunt trauma abdomen were included in this study. Approval was taken from institutional review committee and written informed consent was taken from every patient. All patients either male or female having age 12 to 60 years, presenting with history of blunt trauma abdomen and undergoing exploratory laparotomy were included in the study. The diagnosis of blunt abdominal trauma was made on the basis of presence of tenderness, rigidity, and bruise on the abdominal wall. Patients presenting within 12 hours of sustaining injury will be included in the study. Patients managed non-operatively, patients suffering from any kind of penetrating abdominal injury and moribund patients of ASA-5 were excluded from the study. Demographic profile of all the subjects was entered in pre-designed proforma. Mode of injury and intra-abdominal injuries involving the kidney, duodenum and pancreas were noted. The scale

devised by the Organ Injury Scaling Committee of the American Association for the Surgery of Trauma was used to grade the injuries to various organs. Grading of injuries was verified by attending consultant.

Data was analyzed by using SPSS version 17. Mean and SD was calculated for numerical data. Frequencies and percentages were calculated for categorical data. Chi square test was used as a test of association. P. value 0.05 was considered as significant.

#### RESULTS:

Total of 110 subjects who suffered from blunt trauma abdomen presented at the Department of Surgery DHQ Hospital, Faisalabad were included in this study. Mean age of the subjects was 36.11±12.57 years. Among the 110 subjects mode of injury was: Physical Assault 17 (15.45%), Fall from height 29 (26.36%) Road Accidents 64 (58.18%). (Fig. 1)

As shown in table 1, Pancreas was injured in 28 (25.45%) subjects and Grade I, II, III IV and V injuries were seen in 7 (25%), 10 (35.7%), 7 (25%), 3 (10.7%) and 1 (3.4%) respectively. In 30 (27.27%) subjects duodenum was injured followed by Grade I, II, III and IV injuries were seen in 5 (16.67%), 15 (50%), 8 (26.27%), 2 (6.8%) respectively and Grade IV injury was not seen in any subject. Out of 34 (30.91%) subjects with injured kidney Grade I, II, III IV and V injuries were seen in 4 (11.8%), 10 (29.4%), 10 (29.4%), 6 (17.6%) and 4 (11.8%) subjects.

Stratification of mode of injury in relation to gender was done. Out of 64 (58.18%) subjects injured with road accidents 53 (82.81%) was male and 11 (17.19%) was female. Among the 29 (26.36%) subjects injured due to fall from height, 24 (82.76%) was male and 5 (17.24%) was female and subjects injured with physical assault 17 (15.46%), male was 15 (88.24%) and female was 2 (11.76%). No association was seen between mode of injury and gender. P. value 0.857. (Table 2). Stratification for age was done. Out of 64 (58.18%) subjects of road accident, 38 (59.38%), 21 (32.81%) and 5 (7.8%) subjects

belonged to age group 12-15 years, 36-50 years and 51-70 years respectively. Out of 29 (26.36%) injured with fall from height, 17 (58.62%) belonged to age group 12-35 years, 8 (27.59%) 26-50 years and 4 (13.8%) belonged to 51 – 70 years age group. Subjectshaving history of

physical assault was 17 (15.46%), 14 (63.64%) belonged to age group 12-35 years, 4 (18.18%) to age group 36-50 years and 4 (18.8%) subjects belonged to age group 51-70 years. No association was seen between mode injury and age group. P. value 0.546. (Table 3).

Fig. 1: Mode of injury

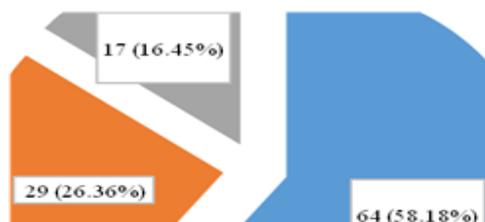


Table 1: Organ and Grades wise injures

Organ injury	Grade of injury					Total (%)
	I (%)	II (%)	III (%)	IV (%)	V (%)	
Pancreas	7 (25)	10 (35.7)	7 (25)	3 (10.7)	1 (3.4)	28 (25.45)
Duodenum	5 (16.67)	15 (50)	8 (26.27)	2 (6.8)	0	30 (27.27)
Kidney	4 (11.8)	10 (29.4)	10 (29.4)	6 (17.6)	4 (11.8)	34 (30.91)
Pancreatoduodenal	13 (72.2)	3 (16.67)	1 (5.6)	1 (5.5)	0	18 (16.36)
<b>Total</b>	<b>28 (25.45)</b>	<b>37 (33.64)</b>	<b>27 (24.56)</b>	<b>12 (10.9)</b>	<b>6 (5.4)</b>	<b>110</b>

Table 2: Stratification for gender

Mode of injury	Gender		Total (%)	P. value
	Male (%)	Female (%)		
Road accidents	53 (82.81)	11 (17.19)	64 (58.18)	<b>0.857</b>
Fall from height	24 (82.76)	5 (17.24)	29 (26.36)	
Physical assault	15 (88.24)	2 (11.76)	17 (15.46)	
<b>Total</b>	<b>92 (83.64)</b>	<b>18 (16.36)</b>	<b>110</b>	

Table 3: Stratification for Age

Mode of injury	Age Group			Total (%)	P. value
	12-35 years	36-50 years	51-70 years		
Road Accident	38 (59.38)	21 (32.81)	5 (7.8)	64 (58.18)	<b>0.546</b>
Fall from Height	17 (58.62)	8 (27.59)	4 (13.8)	29 (26.36)	
Physical Assault	14 (63.64)	4 (18.18)	4 (18.18)	17 (15.46)	
<b>Total</b>	<b>87 (58.0)</b>	<b>46 (30.67)</b>	<b>17 (11.33)</b>	<b>110</b>	

## DISCUSSION:

Retroperitoneal organ injuries following blunt abdominal trauma have remained a challenge to surgeons with an ever-present desire to improve the early diagnosis and the outcome of the management. Blunt abdominal trauma is a leading cause of morbidity and mortality among all age groups.<sup>11</sup>

In our study, male subjects were more victims of abdominal trauma as compared to female subjects which is in agreement with study by Khan et al.<sup>6</sup> Young males, most of all those aged 20 to 30 years, have been reported to be the most frequent victims. Vehicle accidents were the most common cause of blunt abdominal trauma. The second most common cause was falling from a height and the third was Physical assault. Our study showing regarding mode of injury, total 58.18% of subjects suffered from Road Accidents, 26.36% had a history of fall from height whereas 15.45% subjects had a history of Physical Assault. Some other studies also reported road accidents, interpersonal violence and falls from height as main causes of blunt abdominal trauma.<sup>12,13</sup> Ahmed et al also reported trauma as the leading cause of mortality in subjects having age 1-44 years.<sup>9</sup> Blunt abdominal trauma accounted for 79% cases and males are more victims of blunt abdominal trauma as compared to female. In one study by Bhattacharjee et al,<sup>14</sup> blunt abdominal trauma is more frequent in males aged 21-30 years; the majority of patients were injured in automobile accidents. In our study duodenum was injured in 27.27% subjects. A study by Zaydfudim et al.,<sup>15</sup> indicated that most of patients with vertical deceleration injuries (i.e., falls from heights), only 5.9% had blunt abdominal injuries. Consistent with these results, studies by Bhattacharjee et al<sup>14</sup> and Antonacci et al,<sup>16</sup> injuries to the duodenum account for approximately 3% to 5% of abdominal trauma. Blunt abdominal trauma as a result of direct blow to the epigastrium, mainly due to road traffic accident and sports trauma (bicycle handle injury), accounts for 25% of all duodenal injuries as shown by Chinnery et al and Girgin et al.<sup>17,18</sup>

In our study kidney damage was noted in 30.91% subjects. Grade I injury was seen in 11.8% subjects, Grade II, III, IV and V injuries were seen 29.4%, 29.4%, 17.6% and 11.8% respectively. Similar findings were reported by Wong et al,<sup>19</sup> 89 cases of Grade 2 renal injuries were recorded with blunt trauma accounting for 94.4%; 57.3% were Grade 2 injuries, 12.4% Grade 3, 25.8% Grade 4, and 4.5% Grade 5. MVAs and motorcycle accidents were the most common cause of injury, accounting for 48.3% of all renal injuries.

In our study pancreas was injured in 25.45% patients, whereas 16.36% had pancreato-duodenal injuries. Traumatic injuries of the pancreas occur after blunt abdominal traumas or penetrating wounds with a ratio of 3:1.<sup>16</sup> These are characterized by high morbidity and mortality with a 45-50% combined rate as reported in the reviewed literature.<sup>17,20</sup> Pancreatic injuries occur in 3-15% of all abdominal trauma. Isolated traumatic injuries of the pancreas are uncommon; in 50-98% of cases they are associated with injuries to other organs, such as spleen, liver, kidney, large/small intestine, veins or arteries. Due to the retroperitoneal location of the pancreas, isolated pancreatic injury occurs in less than 5% of cases of major blunt abdominal trauma.<sup>21</sup>

## CONCLUSION:

In this study road accidents were the most common cause of blunt abdominal trauma and most of the subjects were found with injury of kidney. This study highlights the need for prioritizing a public health approach to abide by traffic laws and violence prevention in Pakistan. Results of this study also reveal that male subjects were more victims of blunt abdominal trauma as compared to female subjects and age group 12-35 years was the most common age group of cases with blunt abdominal trauma.

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