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Research Article

A CROSS-SECTIONAL RESEARCH TO ESTIMATE THE ASSOCIATION OF ORGANAL INJURY WITH BLUNT ABDOMINAL TRAUMA

¹Dr Mudassar Abbas, ²Dr Ayesha Rehman, ³Dr Aqil Hassan ¹Medical Officer Rural Health Centre Maghian, Pindigheb, Attock ²Children hospital Faisalabad ³Islamic International Medical College

Abstract:

Objective: The objective of this research was to evaluate the injured intra-abdominal organs correlated with abdominal trauma. **Methodology:** This cross-sectional research was carried out at Jinnah Hospital, Lahore (February to November 2018). The total research sample included 110 patients who presented blunt trauma abdomen history who underwent investigative laparotomy. Patients gave their consent before the commencement of this study. Ethical review committee permission was also taken before the commencement of research. The patients were selected in the age limit of 12 years to 60 years. Blunt abdominal trauma diagnosis was carried out with the presence of rigidity, tenderness and bruise on the wall of the abdomen. All those patients sustaining an injury for twelve hours were made a part of the research. We did not include all those patients who were treated non-operatively, moribund ASA-5 patients and penetrating abdominal injuries.

Results: In the total sample of 110 we included all those patients who presented a history of blunt abdominal trauma with a mean age of (36.11 ± 12.57) years. There were 92 males (83.64%) and 18 females (16.36%). There were 64 road accident cases (58.18%), 29 height fall cases (26.36%) and 17 cases of physical assault (15.46%). In terms of injuries, 28 cases were of the injured pancreas (25.45%), 30 with injured Duodenum (27.27%), 34 with injured kidney (30.91%) and 18 suffered pancreaticoduodenal injuries (16.36%).

Conclusion: Most of the patients suffered injuries due to road accidents with the common injured site of blunt abdominal trauma and the next most common occurrence of injuries was reported about the kidney. Research highlights prioritization of public health approach for the awareness about traffic laws and abiding by those laws along with prevention about violence in the country as most of the injuries resulted due to violence and road accidents. Outcomes also show that most of the injured cases were male than females and they experienced blunt abdominal trauma. Most involved group for injures was from 12 years to 35 years of age. **Keywords:** Retroperitoneal Organs, Blunt Trauma, Abdominal, Laparotomy, Road Accident, Traffic, Violence and Injury.

Corresponding author:

Dr.Mudassar Abbas, *Medical Officer Rural Health Centre Maghian, Pindigheb, Attock*



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INTRODUCTION:

Abdominal trauma causes a higher rate of mortality and morbidity as it is a general health issue even in the developed financial stage [1]. Death is mainly attributed to trauma along with disabilities and prolonged hospitalization [2]. The global percentage of stress and death due to trauma is 33%. Due to negligible protection abdomen is a major affected organ as no bone protection exists for the internal organs. The increase in the rate of trauma is attributed to increased violence, urbanization, use of criminal force and wars [3]. These occurrences vary from region to region due to various trauma mechanisms and etiological range [4].

Abdominal trauma is more penetrating and blunter than other injuries [1]. An improper diagnosis also causes an increase in the mortality rate after experiencing abdominal trauma [5]. The major reasons behind abdominal blunt trauma are height falls, road traffic accidents and related industrial events [5]. Road Traffic accidents cause 83.6% burden of blunt trauma including 45.5% due to vehicles accidents and 38.1% due to bike accident [6]. Death is reported less in penetrating trauma cases than blunt trauma cases due to the absence of proper diagnosis and timely management. The determination of internal injuries among patients due to abdominal blunt trauma is quite difficult and not easy to diagnose [7]. Internal injuries compose 13% of the abdomen related trauma [8]. Above 50% of the patients received spleen injuries due to blunt abdominal trauma [9]. Few of the authors presented the most affected areas in the form of hepatic injuries [10]. The objective of this research was to evaluate the injured intra-abdominal organs correlated with abdominal trauma.

MATERIAL AND METHODS:

This cross-sectional research was carried out at Jinnah Hospital, Lahore (February to November 2018). The total research sample included 110 patients who presented blunt trauma abdomen history who underwent investigative laparotomy. Patients gave their consent before commencement of this study. Ethical review committee permission was also taken before the commencement of research. The patients were selected in the age limit of 12 years to 60 years. Blunt abdominal trauma diagnosis was carried out with the presence of rigidity, tenderness and bruise on the wall of the abdomen. All those patients sustaining an injury for twelve hours were made a part of the research. We did not include all those patients who were treated non-operatively, moribund ASA-5 patients and penetrating abdominal injuries.

We filled a pre-designed Performa with the demographic profile of the patients and documented intraabdominal injuries, mode of injury, injuries related to pancreas, duodenum and kidney with the help of scale devised by American Surgical Association for the grading of different organ-related injuries. A consultant performed organ injury grading. SPSS software was used for the statistical analysis of the outcomes (P-Value 0.05).

RESULTS:

In the total sample of 110, we included all those patients who presented a history of blunt abdominal trauma with a mean age of (36.11 ± 12.57) years. There were 92 males (83.64%) and 18 females (16.36%). There were 64 road accident cases (58.18%), 29 height fall cases (26.36%) and 17 cases of physical assault (15.46%). In terms of injuries, 28 cases were of the injured pancreas (25.45%), 30 with injured Duodenum (27.27%), 34 with injured kidney (30.91%) and 18 suffered pancreaticoduodenal injuries (16.36%).

Table – I (Mode of Injury), Table – II (Organ/Grade Wise Division of Injury) and Table – III (Comparison of Age and Gender) shows related outcomes in detail.

Tabl	e –	I:	Mode	of	Inj	ury
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Injury Mode	Number	Percentage	
Physical Assault	17	16.45	
Height Fall	29	26.36	
Road Accidents	64	58.18	



 Table – II: Organ/Grade Wise Division of Injury

Injury Organ/ Injury Grade		Pancreas	Duodenum	Kidney	Pancreato-duodenal	Total
Grade – I	Number	7	5	4	13	28
	Percentage	25	16.67	11.8	72.2	25.45
Grade – II	Number	10	15	10	3	37
	Percentage	35.7	50	29.4	16.67	33.64
Grade – III	Number	7	8	10	1	27
	Percentage	25	26.27	29.4	5.6	24.56
Grade – IV	Number	3	2	6	1	12
	Percentage	10.7	6.8	17.6	5.5	10.9
Grade – V	Number	1	0	4	0	6
	Percentage	3.4	0	11.8	0	5.4
Total	Number	28	30	34	18	110
	Percentage	25.45	27.27	30.91	16.36	100



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Gender and Age			Road Accidents	Height Fall	Physical Assault	Total	P-Value
Gender -	Male	Number	53	24	15	92	0.857
		Percentage	82.81	82.76	88.24	83.64	
	Female	Number	11	5	2	18	
		Percentage	17.19	17.24	11.76	16.36	
Age	12 – 35 Years	Number	38	17	14	87	0.546
		Percentage	59.38	58.62	63.64	58	
	36 – 50 Years	Number	21	8	4	46	
		Percentage	32.81	27.59	18.18	11.33	
	51 – 70 Years	Number	5	4	4	17	
		Percentage	7.8	13.8	18.18	11.33	

Table –	III:	Com	parison	of Age	and	Gender
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DISCUSSION:

Retroperitoneal injuries to different organs after blunt abdominal trauma cause a challenging situation for the surgeons; it also requires early diagnosis and initiation of suitable treatment. Every age group faces an increased mortality and morbidity rate due to blunt abdominal trauma [11].

In this research, the male was more involved in injuries than females due to increased exposure to the outer world which is in agreement with the outcomes presented by Khan [6]. Most frequently affected age group was of 20 years to 30 years aged young males. There were 92 males (83.64%) and 18 females (16.36%). There were 64 road accident cases (58.18%), 29 height fall cases (26.36%) and 17 cases of physical assault (15.46%). In terms of injuries, 28 cases were of the injured pancreas (25.45%), 30 with injured Duodenum (27.27%), 34 with injured kidney (30.91%) and 18 suffered pancreaticoduodenal injuries (16.36%). Few other authors also reported different proportions of abdominal blunt trauma caused by height falls, interpersonal violence and vehicle accidents [12, 13].

According to Ahmed, trauma caused more death in the age bracket of (1 - 44) years [9]. Blunt abdominal trauma was reported in 79% patients which included a majority of males than females. Most of the automobile accidents involved most of the male victims of blunt abdominal trauma in the age bracket of (21 - 30) years [14]. We reported 27.27% of

patients with an injured duodenum. Another study indicated a number of patients injured with a vertical declaration such as height fall cases; whereas, blunt trauma injury was only reported among 5.9% patients [15]. Two other studies also reported abdominal trauma injuries (5%) and duodenum injuries (3%) [14, 16]. Blunt abdominal trauma is an outcome of a direct hit to epigastrium due to sports trauma and RTA which causes duodenal injuries (26%) [17, 18]. During cycling, handle causes such injuries in sports activities.

Damage to the kidney was reported among 30.91% of patients. In terms of injury grading, there were 11.8% (Grade – I), 29.4% (Grade – II), 29.4% (Grade – III), 17.6% (Grade - IV) and 11.8% (Grade - V) injuries. Wong also reported similar outcomes with respect to injury grading [19]. Motorcycle and vehicle accidents caused most of the renal injuries (48.3%). There were 25.45% cases of the injured pancreas in this research; whereas the pancreaticoduodenal injuries proportion was 16.36%. Pancreas traumatic injuries occur due to penetrating sounds and blunt abdominal trauma characterizing higher rates of mortality and morbidity (40% - 50%) [17, 20]. The occurrence rate of pancreatic injuries is in the bracket of (3% - 15%). There is no common occurrence of isolated traumatic injuries; in 50% - 98%, these injuries have a correlation with other organ injuries like arteries, veins, large intestine, small intestine, kidney, liver and spleen. Isolated pancreatic injury occurrence is under 5% because of the retroperitoneal location [21].

CONCLUSION:

Most of the patients suffered injuries due to road accidents with the common injured site of blunt abdominal trauma and the next most common occurrence of injuries was reported about the kidney. Research highlights prioritization of public health approach for the awareness about traffic laws and abiding by those laws along with prevention about violence in the country as most of the injuries resulted due to violence and road accidents. Outcomes also show that most of the injured cases were male than females and they experienced blunt abdominal trauma. Most involved group for injures was from 12 years to 35 years of age.

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