CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.1412717

Available online at: http://www.iajps.com Research Article

A CROSS-SECTIONAL RESEARCH ON CLASSIFICATION OF SPLEEN AND LIVER INJURIES DUE TO BLUNT ABDOMINAL TRAUMA WITH RESPECT TO GENDER & AGE

Dr. Hafiza Madeeha Latif, Dr. Maria Ghafoor, Dr. Rabbia Bajwa
Allied Hospital Faisalabad

Abstract:

Objective: *Objective of our research was to determine the grading of spleen and liver injury frequencies on exploratory laparotomy after the blunt trauma of abdomen.*

Methods: *Our cross-sectional was carried out Service Hospital, Lahore (August 2016 to March 2017). We included all those cases who had a history of blunt trauma of abdomen, intraabdominal haemorrhage, hemodynamic instability (Pulse rate above 100 beats per minute and systolic BP under 90 mmHg) and about to experience exploratory laparotomy. Both male and female patients were included in the research in the age bracket of (16 – 50) years. We did not include non-operative, penetrating injury of abdomen, stampede and natural disaster injured cases with those who were not willing to participate in the research. Informed consent and ethical approval were taken before the commencement of research. Data was analyzed on SPSS.*

Results: *Research sample consisted of 183 blunt trauma of abdomen cases with a mean age of (31.05 ± 9.25) years. In the total sample, 136 males (74.3%) and 47 females (25.7%) were included. Spleen and Liver injuries were reported in 121 and 96 with respective proportions of (66.1%) and (52.5%). Liver injury cases were classified in Grade I, II, III, IV and V with the respective proportion of 38 G-I (20.8%), 29 G-II (15.8%), 24 G-III (13.1%), 3 G-IV (1.6%) and 2 G-V (1.1%) cases. Spleen injury cases were also classified in Grade I, II, III, IV and V with the respective proportion of 40 G-I (21.9%), 24 G-II (13.1%), 27 G-III (14.8%), 24 G-IV (13.1%) and 6 G-V (3.3%) cases.*

Conclusion: the *Most repeated abdominal injury was blunt trauma. Young males were dominantly affected than females. Most commonly injured organ was spleen in the blunt trauma patients than liver. Splenic injuries were mostly graded as Grade I & III.*

Keywords: *Focused Assessment, Blunt Abdominal Trauma, Trauma Sonography, Mortality, Computed Tomography and Diagnostic Peritoneal Lavage.*

Corresponding author:
Dr. Hafiza Madeeha Latif,
Allied Hospital,
Faisalabad

QR code

Please cite this article in press Hafiza Madeeha Latif et al., ***A Cross-Sectional Research on Classification of Spleen and Liver Injuries Due To Blunt Abdominal Trauma With Respect To Gender & Age.,*** *Indo Am. J. P. Sci, 2018; 05(09).*

INTRODUCTION:

An exchange of environmental energy that is more than the resilience of the human body is called trauma [1]. Society is facing the burden of deaths caused by trauma even in the advanced strategies of disease management. People under the age of fifty years face mortality and morbidity all over the world which is also increasing the disease management costs [2]. The abdomen is a large surfaced area which is affected most of all due to injuries [4]. Spleen and Liver are common organs affected by abdominal blunt trauma along with hemoperitoneum in the second and third decade of life [10]. Abdominal blunt trauma cases experiencing laparotomy were reported Liver and Spleen injuries respectively in 47.9% and 61.7% of cases [3]. Liver injuries were mostly found in Grade I, II & III having a respective proportion of 42.8%, 28.35% and 22.85% [4]. Spleen injuries were also reported in Grade I, II, III, IV and V respectively as 31.34%, 19.40%, 23.88%, 20.90% and 4.48% [13]. After the incidence of Spleen and Liver blunt injuries, the rate of mortality was as high as (12%) [4].

The weight of the abdomen is about 1500 grams, which makes it the largest organ and its location is in the abdomen right upper part under diaphragm which is guarded by ribs [5]. The blunt injury was the major cause of liver injuries because of the solid shape of the Liver and compression force applied to it from ribs can burst the liver [6]. Location of Spleen is in between stomach and diaphragm in the guard of rib number nine to eleven [7]. Spleen injuries are caused because of a direct trauma blunt as the force is directly exerted on the mentioned ribs [6]. A rib fracture is forty percent linked with liver injury and twenty-three percent with spleen injury [8]. Emergency operations required for intra-abdominal injuries are high in case of six ribs are damaged which is reported about 51% [9].

It is important to define Liver and Spleen injuries in order to assess and understand the effects of these injuries on the patients. We can associate Liver and Spleen injuries with hematoma, exploratory laparotomy bleeding or wound observed on Liver and Spleen surface area as classified by the American Trauma Surgery Association [1, 4]. SPSS was used for data entry and analysis. Quantitative and qualitative variables were calculated for outcome representation. Gender and age stratification was also carried out to control the effect of the modifiers. Variables effect was also assessed by Chi-Square Test ($P \leq 0.05$).

RESULTS:

The research sample consisted of 183 blunt trauma of abdomen cases with a mean age of (31.05 ± 9.25) years. In the total sample, 136 males (74.3%) and 47 females (25.7%) were included. Spleen and Liver injuries were reported in 121 and 96 with respective proportions of (66.1%) and (52.5%). Liver injury cases were classified in Grade I, II, III, IV and V with the respective proportion of 38 G-I (20.8%), 29 G-II (15.8%), 24 G-III (13.1%), 3 G- IV (1.6%) and 2 G-V (1.1%) cases. Spleen injury cases were also classified in Grade I, II, III, IV and V with the respective proportion of 40 G-I (21.9%), 24 G-II (13.1%), 27 G-III (14.8%), 24 G-IV (13.1%) and 6 G-V (3.3%) cases. Liver injuries were mostly found in Grade I, II & III having respective proportion of 42.8%, 28.35% and 22.85%. Spleen injuries were also reported in Grade I, II, III, IV and V respectively as 31.34%, 19.40%, 23.88%, 20.90% and 4.48%. After the incidence of Spleen and Liver blunt injuries, the rate of mortality was as high as (12%). There was no significant correlation between age groups about the injuries with a significant P-value as 0.64. We also found no correlation between gender and age in terms of outcomes as reflected in the tabular data. There was also no significant association in the gender about Spleen injury.

Table – I: Blunt Trauma, Liver and Spleen Injury

Details		Frequency	Percentage
Gender	**Male**	136	74.3
	Female	47	25.7
	Total	183	100
Age Group (Years)	**17 - 33**	113	61.7
	34 - 49	70	38.3
	Total	183	100
Injury of Liver	**Yes**	96	52.5
	No	87	47.5
	Total	183	100
Spleen Injury	**Yes**	121	66.1
	No	62	33.9
	Total	183	100

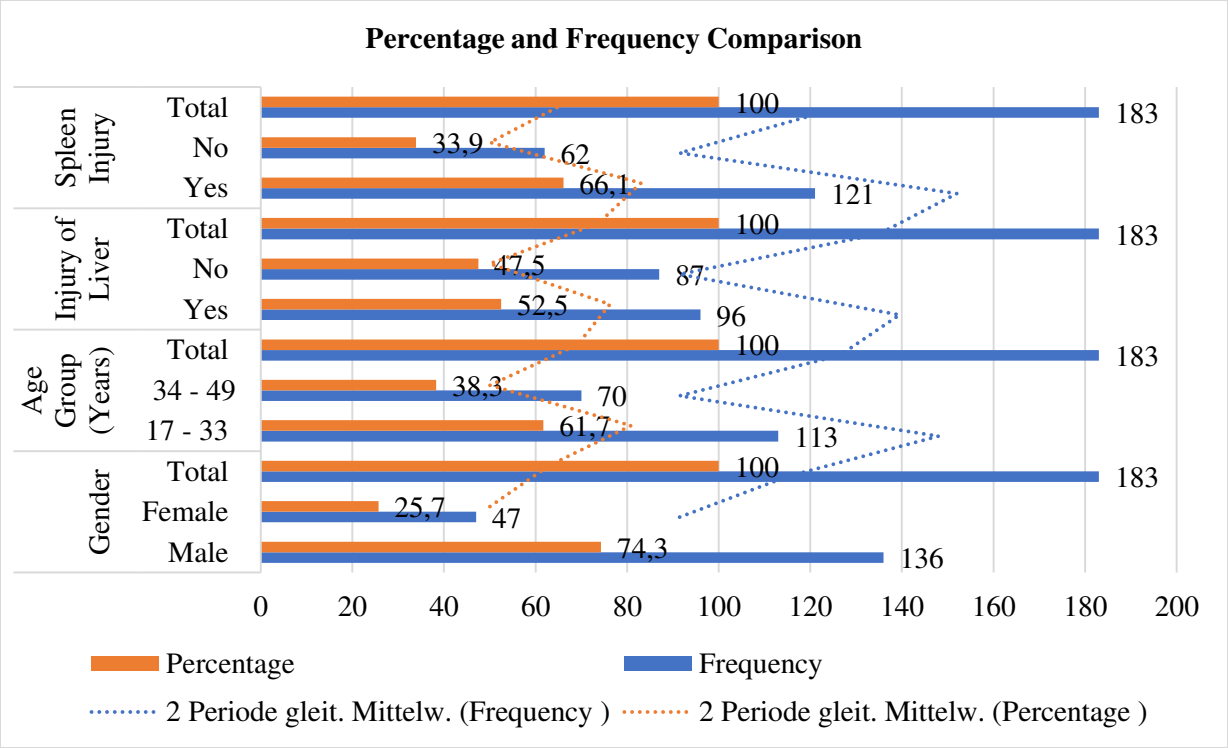
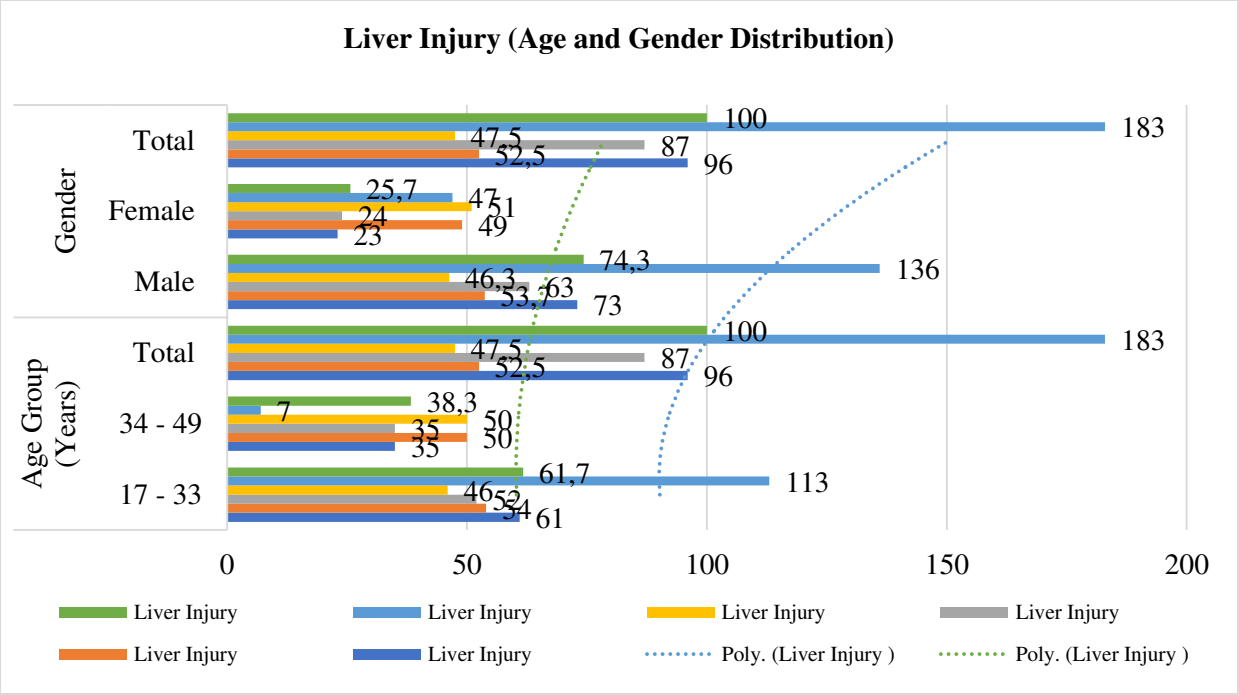
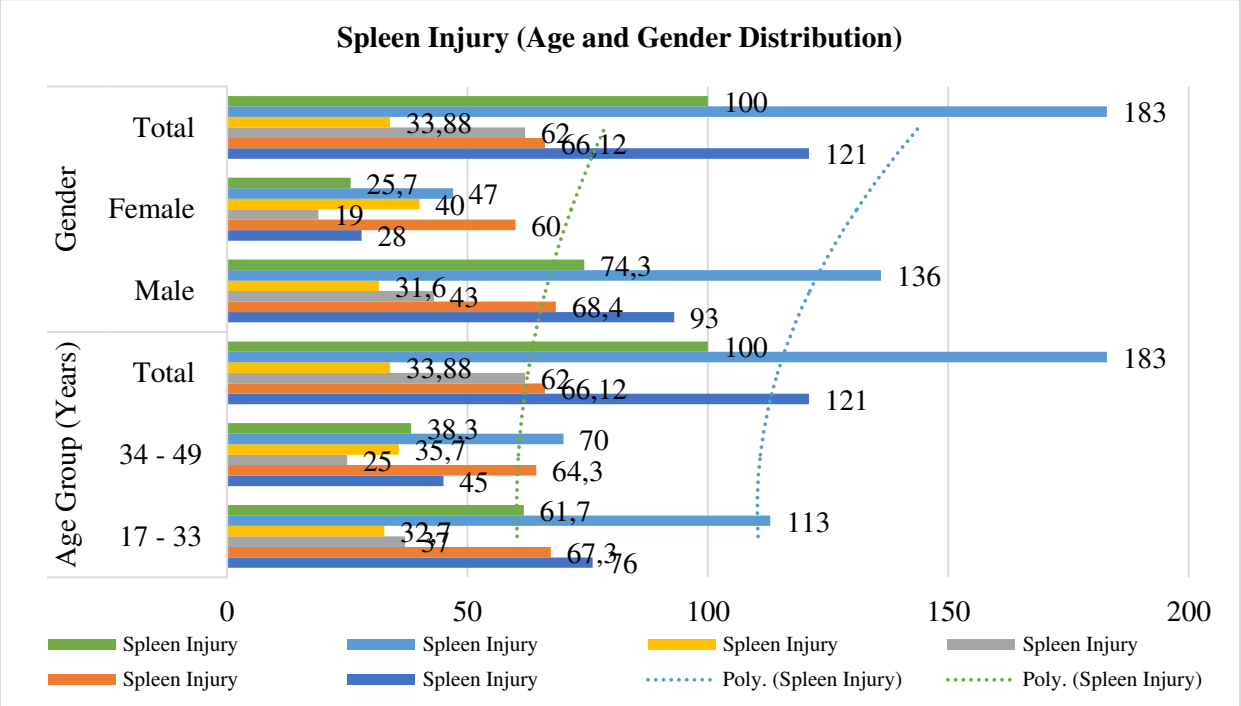
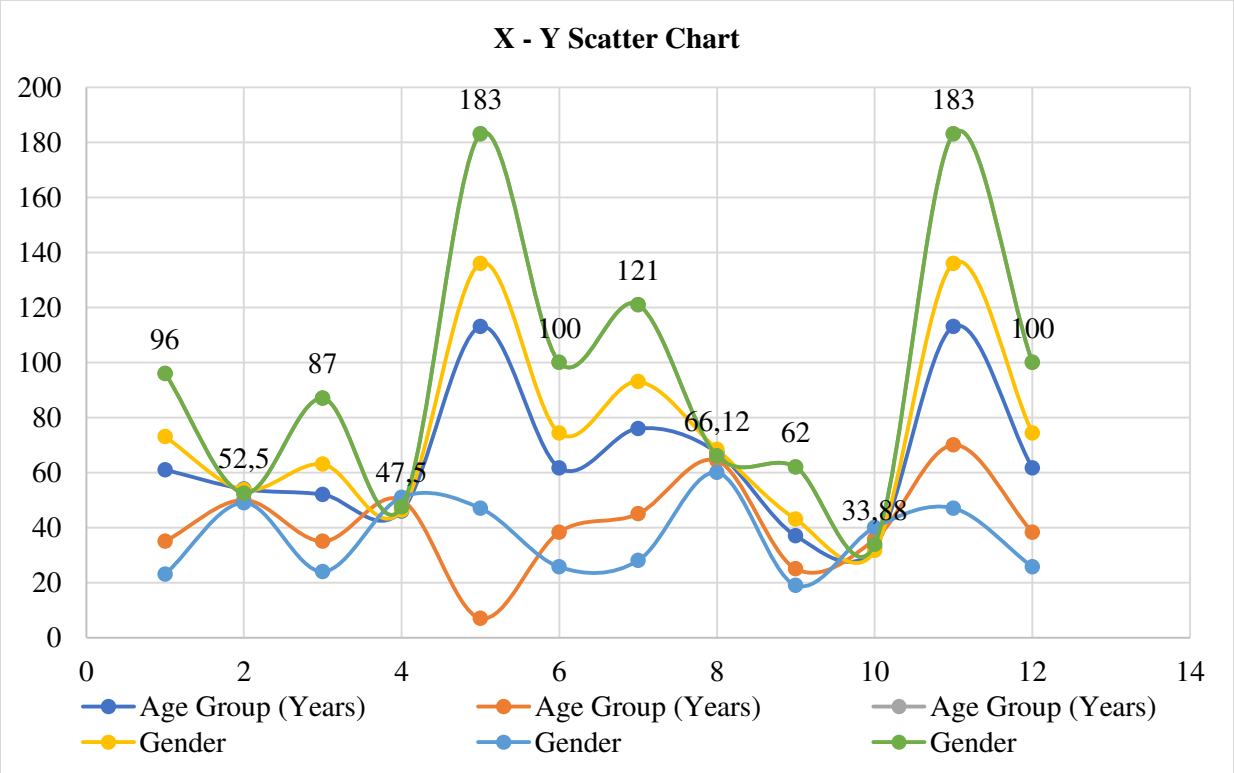


Table – II: Liver and Spleen Injury Distribution

Age and Gender Distribution			Age Group (Years)			Gender		
			17 - 33	34 - 49	Total	Male	Female	Total
Liver Injury	Yes	N	61	35	96	73	23	96
		%	54	50	52.5	53.7	49	52.5
	No	N	52	35	87	63	24	87
		%	46	50	47.5	46.3	51	47.5
	Total	N	113	7	183	136	47	183
		%	61.7	38.3	100	74.3	25.7	100
Spleen Injury	Yes	N	76	45	121	93	28	121
		%	67.3	64.3	66.12	68.4	60	66.12
	No	N	37	25	62	43	19	62
		%	32.7	35.7	33.88	31.6	40	33.88
	Total	N	113	70	183	136	47	183
		%	61.7	38.3	100	74.3	25.7	100
P-Value			0.64, 0.74			0.61, 0.28		


Liver Injury (Age and Gender Distribution)
Gender
Total
Female
Male
Age Group (Years)
Total
34 - 49
17 - 33
0
50
100
150
200
Liver Injury
Poly. (Liver Injury)


Spleen Injury (Age and Gender Distribution)
Gender
Total
Female
Male
Age Group (Years)
Total
34 - 49
17 - 33
0
50
100
150
200
Spleen Injury
Poly. (Spleen Injury)



DISCUSSION:

All age groups are affected by the injuries of blunt trauma of abdomen [10]. Serious pathology of intra-abdomen is sometimes very difficult and challenging. The initial assessment may fail in the manifestation of injuries in the course of treatment. Injury mechanisms may pose other associated injuries which may pose a threat to the life of the patients [11]. Most frequent injuries of blunt trauma are caused by the motor-cycle accidents, vehicle accident, assaults, pedestrians struck and falls [17]. A physical assessment will not suffice the need of diagnosis, various modalities are used for the diagnosis of the injuries such as laparoscopy, ultrasonography and CT scans. Abdominal exploration is required in 25% of trauma patients [12]. Males were dominantly affected than females as 74.3% of the males were involved in the blunt trauma cases which can be compared with the outcomes of Gad MA et al. [13]. The maximum occurrence was reported in the age group of (17 – 33) years which is treated as Group – I in this research and Group – II was a second most affected group with an age bracket of (34 – 49) years. Maximum incidence reporting in the age bracket of (20 – 29) years was reported by Frick EJ et al.; whereas, Mufti reported the age of 27 years [14, 15].

Trauma injuries were reported in 52.5% of the patients which is comparable with the outcomes as reported by Mohamed AA and Memon respectively 47.9% and 53.12% [3, 16]. Raza reported 13.2% liver injury cases with the maximum trend of Grade – III cases (58.8%) which is also comparable with our research [17]. Liver injury incidence was reported about 28.57% by Aman [18]. Liver injury grading was also reported by Saaiq in his research as Grade I, II, III and IV were respectively reported as 32.7%, 36.2%, 25.6% and 6.1% [19].

A common onset of blunt trauma was commonly reported in the age bracket of (17 – 33) years about (61.7%). M Swarnkar reported 64.06% cases of abdomen blunt trauma in the age group of (11 – 40) year, which is almost the same as our outcomes [20]. Spleen is a very vulnerable organ for injuries even in the guard of ribs in almost every age group [1]. It is a vascular and friable organ which carried twenty-five percent of lymphoid tissue with both immunological and haematological functions [15]. We found 66.1% cases of spleen injury; whereas, Raza reported the same as 29.8% [17]. Najafi and Ghazanfar reported 18.5% & 23% cases of spleen injuries [21, 22]. Sample population may be the cause of varying outcomes. Renzulli P reported Spleen injury Grades I, II, III, IV and V with respective proportions of 20.9%, 25.2%, 29.1%, 20.4% and 4.4% [23]. Various reasons are responsible for the difference in the outcomes such as age group and a number of patients enrolled in the research.

CONCLUSIONS:

The most repeated abdominal injury was blunt trauma. Young males were dominantly affected than females. Most commonly injured organ was spleen in the blunt trauma patients than liver. Splenic injuries were mostly graded as Grade I & III.

REFERENCES:

1. Aman Z, Ikramullah AH, Iqbal Z, Aslam R, Aman AWZ, Wahab A. Frequency of hepatic trauma in patients with abdominal firearm injuries. KJMS.2011;3(2):77.
2. Saaiq M, Niaz-ud-Din MZ, Shah SA. Presentation and outcome of surgically managed liver trauma: experience at a tertiary care teaching hospital. JPMA The Journal of the Pakistan Medical Association.2013;63(4):436–9.
3. M Swarnkar, P Singh, S Dwivedi. Pattern of Trauma in Central India: An Epidemiological Study with Special Reference to Mode of Injury. The Internet Journal of Epidemiology.2009 Volume 9 Number 1.
4. Najfi S M, Khan A F A, Gondal K M. Spectrum of injuries in blunt abdominal trauma at Mayo Hospital, Lahore. Biomedica,1995; 11: 18-22.
5. Ghazanfar A, Chaudhary Z A, Zubair M, Nasir S M, Khan S A, Ahmad W. Abdominal solid visceral injuries in blunt abdominal trauma. An experience in busy surgical unit of Mayo Hospital, Lahore. Annals KEMC 2001;7: 85-7.
6. Renzulli P, Gross T, Schnüriger B, Schoepfer AM, Inderbitzin D, Exadaktylos AK, et al. Management of blunt injuries to the spleen. Br J Surg. 2010 Nov;97(11):1696–703.
7. Williams SN, Bulstrode KJC, O'Connell RP. Bailey & Love's Short Practice of Surgery.25th ed. London: Hodder Arnold; 2008.
8. Farquharson M, Moran B. Farquharson's Textbook of Operative General Surgery. 9th ed. London: Hodder Arnold; 2005.
9. Park S. Clinical Analysis for the Correlation of Intra-abdominal Organ Injury in the Patients with Rib Fracture. Korean J Thorac Cardiovasc Surg. 2012 Augt;45(4):246–250.
10. Al-Hassani A, Abdulrahman H, Afifi I, Almadani A, Al-Den A, Al-Kuwari A, et al. Rib fracture patterns predict thoracic chest wall and abdominal solid organ injury. Am Surg. 2010 Aug;76(8):888-91.
11. Mukhopadhyay. Intestinal Injury from Blunt Abdominal Trauma: A Study of 47 Cases. Oman Medical Journal [Internet]. 2009 [cited2014 Jun 9]; Available from: http://www.omjournal.org/OriginalArticles/FullText/200910/FT_IntestinalInjuryfromBlunAbdominalTraumaAStudy.html.
12. Nyongole OV, Akoko LO, Njile IE, Mwanga AH, Lema LE. The Pattern of Abdominal Trauma as Seen at Muhimbili National Hospital Dar es Salaam, Tanzania. East and Central African Journal of Surgery.2013;18(1):40–7.
13. Journal of Emergencies, Trauma, and Shock [Internet]. [cited 2014 Jun 9]. Available from: http://www.linkedin.com/today/post/article/20140419140926-36789366-journal-ofemergencies-trauma-and-shock.
14. Gad MA, Saber A, Farrag S, Shams ME, Ellabban GM. Incidence, Patterns, and Factors Predicting Mortality of Abdominal Injuries in Trauma Patients. N Am J Med Sci. 2012Mar;4(3):129–34.
15. Frick EJ Jr, Pasquale MD, Cipolle MD. Small-bowel and mesentery injuries in blunt trauma. J Trauma. 1999 May;46(5):920–6.
16. Mufti TS, Akbar I, Ahmed S. EXPERIENCEWITH SPLENIC TRAUMA IN AYUBTEACHING HOSPITAL, ABBOTTABAD. J Ayyub Med Coll Abbottabad [Internet]. 2007[cited 2014 Jun 6];19(3). Available from: http://www.ayubmed.edu.pk/JAMC/PAST/19-3/01%20Tariq%20Mufti.pdf.
17. Memon MR, Sanghi AG, Abbasi SA, Memon AA. Role of laparoscopy in blunt abdominal trauma. Rawal Medical Journal.2013;38(1):40–3.
18. Raza M, Abbas Y, Devi V, Prasad KV, Rizk KN, Nair PP. Non-operative management of abdominal trauma-a 10 years review. World J Emerg Surg. 2013;8(1):14.
19. Macleod JBA, Cohn SM, Johnson EW, McKinney MG. Trauma deaths in the first hour: are they all unsalvageable injuries? Am J Surg. 2007; 193:195-9.
20. Saltzherr TP. Optimizing the initial evaluation and management of severe trauma patients [Dissertation]. Amsterdam: University of Amsterdam; 2011.
21. Mohamed AA, Mahran KM, Zaazou MM. Blunt abdominal trauma requiring laparotomy in poly-traumatized patients. Saudi Med J.2010 Jan;31(1):43-8.
22. Khan JS, Iqbal N, Gardezi JR. Pattern of visceral injuries following blunt abdominal trauma in motor vehicular accidents. J Coll Physicians Surg Pak. 2006; 16:645-7.
23. Brunicardi CF, Andersen KD, Billiar RT, Dunn LD, Hunter GJ, Mathews BJ, et al. Schwartz's Principals of Surgery. 9thed. New York: McGraw Hill; 2010.