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Prospective Forensic Autopsy Study of Abdominal and Pelvic Trauma Due To Road Traffic Injuries

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Abstract

Background: Vehicular injuries are one of the most common contributory factors to the abdominopelvic trauma. Injuries to the abdomen and pelvis are often associated with injuries to other body parts like the head, chest, spine, and extremities. AIMS & objectives: To study the pattern, prevalence of abdominal and pelvic injuries in relation to age, sex, type of vehicle, and organ injured. **Methods:** For the present prospective study, 500 cases were collected from the autopsies, showing abdominal and/or pelvic injuries, carried out at the mortuary of Government Medical College, Amritsar. **Results:** The maximum no. of cases 245(49%) were found in the age group of 21-40 years and males constituted 420(84%) of the total cases. The majority of cases were from rural 340(68%) background. The most injured organ was the liver having contusions in 20 cases (4%) and laceration in 125 cases (25%), followed by the spleen, which had contusions in 10 cases (2%) and laceration in 70 cases (14%). **Conclusions:** Abdominal and Pelvic injuries being the potential factor in increasing morbidity and mortality, therefore the main objective is to pay proper attention towards the early, accurate diagnosis and satisfactory management to reduce morbidity and mortality in all road side accident injury cases.

Keywords:- Road Traffic Injuries, Abdomino-Pelvic Injuries, Road Safety.

INTRODUCTION

With the exploding population, increasing registration of automobiles every month, rampant encroachment of roads, the nasty tendency of violating traffic rules, and chaotic traffic systems have contributed significantly to rapid strides in road traffic injuries.[1] Injuries to the abdomen and pelvis are often associated with injuries to other body parts like head, chest, spine, and extremities. So intra-abdominal or intra-pelvic involvement may be overlooked.[2]

Aims and Objectives: To study the pattern of abdominal and pelvic injuries inflicted during

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road side accident in relation to the age, sex, socio-economic status, type of victim and the organ injured.

MATERIAL AND METHODS

The present prospective study was conducted on 500 subjects who died as a result of road traffic injuries and whose medico-legal autopsies were carried out in the mortuary of the department of Forensic Medicine and Toxicology, Government Medical College, Amritsar during the period from11/01/2011 to 29/09/2012.

Inclusion criteria

All those cases of abdominal and pelvic trauma with or without any associated body injuries who were hospitalized following road side accident and subsequently succumbed to their injuries were included in the study.

Exclusion criteria

All the cases in which injuries were caused in the manner other than road traffic injuries and decomposed bodies and those cases where the nature of sustenance of injury was not known were not included in the study.

RESULTS

Most of cases 245(49%), were found in the age group of 21-40 years followed by 140 cases (28%) in the age group of 41-60 years. Individually also road traffic injuries were common in both sexes in the age group of 21-40 years, in males 215 cases (51.19%) and in females 30 cases (37.5%), respectively.

Table 1: Show the external injuries over the abdominopelvic region which included Contusions in 70 (14%) cases, Laceration in 35 (7%) cases, Abrasions in 140 (28%) cases, and externally evident fracture dislocation of the pelvis or lumbar spine were present in 5 (1%) cases.

Area Affected	Contusions		Lacerations		Abrasions		Fractures/Dislocations		No External Injury on abdominopelvic region	
	No.	%	No.	%	No	%	No.	%	No	%
Abdomen and Pelvis	70	14	35	7	140	28	5	1	250	50

Table 2: The most commonly injured organ was the liver, having contusions in 20 cases (4%) and laceration in 125 cases (25%) followed by spleen, which had contusions in 10 cases (2%) and laceration in 70 cases (14%). The omentum was contused in 117 cases (23.4%) and lacerated in 15 cases (3%). The injury to the kidney was in the form of contusion in 25 cases (5%) and lacerated in 45 cases (9%). The pelvis was found fractured in 40 cases (8%) while the sacrum in 10 cases (2%) and the lumbar spine in 4 cases (0.8%). In the distribution of internal injuries of abdominopelvic region, peritoneal haemorrhage was observed in the majority 180 cases (36%). Retro peritoneal haemorrhage seen in 35 cases (7%).

Organ Affected	Contusions		Lacerations		Fractures/Dislocations	
	No.	%	No.	%	No.	%
Diaphragm	0	0	5	1	-	-
Omentum	117	23.4	15	3	-	-
Liver	20	4	125	25	-	-

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Gall Bladder	19	3.8	8	1.6	-	-
Spleen	10	2	70	14	-	-
Pancreas	8	1.6	4	0.8	-	-
Adrenals	10	2	3	0.6	-	-
Stomach	12	2.4	1	0.2	-	-
Small Intestine	5	1	10	2	-	-
Large Intestine	15	3	10	2	-	-
Mesentry	23	4.6	6	1.2	-	-
Kidneys	25	5	45	9	-	-
Urinary Bladder	5	1	35	7	-	-
Urethra	5	1	20	4	-	-
Scrotum	10	2	5	1	-	-
Uterus	4	0.8	1	0.2	-	-
Ovaries	0	0	1	0.2	-	-
Lumbar Spine	6	1.2	1	0.2	4	0.8
Sacrum	-	-	-	-	10	2
Pelvic Bones	-	-	-	-	40	8
Peritoneal Haemorrhage	180		36		-	-
Retroperitoneal haemorrhage	35		7		-	-
Vascular Injury	6		1.2		--	-

Table 3: Distribution of the cause of death in road side accident cases. It shows that the most common cause of death was head injury seen in 275 (55 %) cases that included compression of the Brain in 185 (37 %) and laceration of brain in 90(18%) cases followed by haemorrhage and shock in 213 (42.6 %) cases.

S.No	Cause of Death	No. of Cases	%
1	Compression of Brain	185	37
2	Haemorrhage and Shock	213	42.6
3	Laceration of Brain	90	18
4	Pulmonary Thromboembolism	2	0.4
5	Septicemia	10	2
	Total	500	100

DISCUSSION

In the present study, in deaths due to road side accident cases, the males dominated females in the ratio of 5.25:1.[3] This dominance of males has also been reported by Singh YN et at (2005) in their study showed that the number of male victims was more than the 7/8th of the total cases,[4] with the male: female ratio = 7:1 In another study by Kaul A et al. (2005),[1] a preponderance of males over females M/F ratio of 3:1 have been observed. Singh R et al (2014) also observed similar pattern in which out of total 347 victims,[5] 258 (74.35%) were males, while only 89 (25.65%) were female subjects.

The present study is in alignment with the study by Singh H et at (2004) in which the commonest age group involved was 21-40 years 47.9%.[6] In another study by Kaul A et al. (2005),[1] the

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major age group involved in fatal Road Traffic Injuries was 25-44 years 33.68%. Khajuria B et al. (2008) also observed that 53.01% of Road Traffic Injuries victims were between 20-40 years of age.[7] Singh R et al (2014) states that highest numbers of victims were in 20-30 years age group 141 40.63% patients.[5] Bal v (2018)8 in his study gathered information that most of the accidents occur in age group of 25-44 years (52.07%) followed by 15-24 years 25.64% and similarly. Chavan et al (2018) observed that maximum cases were of age group 21- 30 years.[3]

In the present study, the majority of the accident occurred in the rural areas in 68% cases and rest in the urban areas 32% cases, which is consistent with the study conducted by Singh YN et at (2005) which showed 43.42% in the urban areas and rural was 16.98%. Elango S et al.(2018) also observed that rural population 61.6 % while urban population includes 38.4%.

In the present study, the majority of victims were motorcyclists 38% followed by pedestrians 27% of the cases. Similar results were also observed by Kuchewar SV et at (2012)9 who showed that 39.8% were on two-wheelers. Khajuria B et at (2008) in their study found majority of the victims 31.1% were on two-wheelers and a study conducted by Khare N et at (2012) who also reported that two-wheeler occupants were highest in number 73%.[7,8,9,10]

In the present study, the most common cause of death was head injury seen in 55 % cases that included compression of the brain in 37 % cases and laceration of the brain in 18% cases. It was followed by haemorrhage and shock seen in 42.6 % cases. Kuchewar et al. (2012),[9] in their study reported head injury 49.54% was largest cause of death. Kaul A et al. (2005) in their study found that victims mostly died of head injuries alone,[1] followed by thoracoabdominal injuries in combination with head injuries. Aggarwal KK et al. (2009) also reported that the cause of death as head injury (57%) followed by abdominal injuries (19%) and thoracic injuries (7%).[11] Similarly, Khajuria et al. (2008) stated that head injury accounted for 69.48% of deaths and haemorrhagic shock for 24.49% of deaths.[7]

Distribution of Abdomino-Pelvic Injuries Amongst the Victims

ln, the present study abdominopelvic trauma was encountered in 185 (37%) cases out of the 500 medicolegal autopsies done on Road Traffic accident victims. The external injuries over the abdominopelvic region included contusions 14%, lacerations in 7%, abrasions in 28% cases and externally evident fracture-dislocations of the pelvis or lumbar spine were present in 1% cases. Amongst the internal injuries, the most commonly injured organ was liver having contusions in 4% cases and laceration in 25% cases, followed by spleen which had contusions in 2% cases and laceration in 14% cases. Peritoneal haemorrhage was observed in 36% cases which were mostly due to combined liver and spleen injuries.[12,13,14] The Omentum was contused in 23.4% cases and lacerated in 3% cases out of 37% cases which is consistent with the study of Sarkar S et at (1995) which showed 14% of the helmeted riders had liver injury compared with 12% of unhelmeted riders.[15] Spleen injuries were present in 11% of cases in both helmeted and unhelmeted riders. The site of injury was kidney and intestines in 3% of cases in both helmet and no helmet use situations. Osterberg EC et at studied 84 cases in which, injury to spleen in 41.7%,[16] liver in

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36.9% and mesentery in 10.7% cases, small intestine injury and retroperitoneal haemorrhage in 9.5% cases, which is similar to the present study. Singh H et at (2004) have seen laceration of the liver (26.9%),[6] spleen 12.7%, gut 4.7%, kidneys 3.8%, and bladder 2.9% which is consistent with the present study. Arumugam S et al, in his study found that the commonest organ injured was liver (34%),[17] intestine 20% and spleen 16% kidney and bladder 16% with relatively low accounting for stomach and omentum that is about 8% which is similar to the present study.

CONCLUSIONS

All abdominal and pelvic injuries constitute a potential factor in increasing the amount of morbidity and mortality, and therefore, proper attention towards their accurate diagnosis and satisfactory management is mandatory. In all the patients of head injury admitted with coma and developing shock, intra-abdominal injury must be considered until proven otherwise. Traffic rules and traffic safety education should be made mandatory for all applying for the driving licence.

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