ORIGINAL ARTICLE

PATTERN OF INJURIES IN ROAD TRAFFIC ACCIDENTS AT PESHAWAR: AN AUTOPSY BASED STUDY

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ABSTRACT

Objective: To assess the pattern of injuries in autopsy examination of road traffic accident cases at Peshawar.

Material and Methods: A community-based descriptive cross-sectional study included a total of 94 candidates presented for autopsy at the forensic medicine department, Khyber medical college from 01st July 2020 to 30th June 2021.

Results: The age of the subjects ranged from 2-80 years with a mean age of 36.9 ± 20.7 years. 96.8 % of subjects were having multiple injuries whereas, 3.2% were having a single injury. Overall, 94 cases had a total number of 303 injuries, out of which 90.76% were small-sized, 7.92% were medium-sized and 1.32% were large-sized including all kinds of injuries. The most common presenting injury was laceration (87.2%), preceded by abrasion (59.6%), then contusion (51.1%), fracture (23.4%), and hematoma (2.1%). The most common region involved in RTA was head & neck with 86.17%. Maximal deaths occurred within 3-6 hours following an RTA. The most common cause of death was an injury to the brain and its associated vessels. There is no significant correlation noted between the patterns of injury and the cause of death of subjects ($p<0.05$).

Conclusion: Our study shows the pattern of injuries and causes of death via RTA, as there is no study conducted in this region. It will be useful to Law Enforcement agencies in implementing rules and regulations in preventing RTA and public awareness.

Keywords: Road Traffic accidents, Autopsy findings

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INTRODUCTION

A Road Traffic Accident (RTA) is defined as an incident that arises on a way or street open to public traffic; which results in the injury or killing of one or multiple individuals and involves at least one mobile vehicle. It's a human disaster. It costs untimely deaths, injuries, and loss of productivity by including severe human miseries and socioeconomic costs.[1] Road traffic accidents causing injuries and death are a major health issue in developing countries, as well as in developed countries causing 85% of all deaths and 90% of total cases of injuries and disabilities in younger life. Road traffic accidents will become 5th leading cause of death globally by 2030. About 91% of total road traffic accident victims are from lower to middle socio-economic countries. The majority of victims of RTA were aged between 5 and 25 years. About 186,300 children (under 18) died from RTA every year which is 3 times greater than in developed countries. [2] According to the most recent WHO data published in 2018, the mortality rate in Pakistan reached 30,046 or 2.42% of total deaths. The age-adjusted death rate is 17.12 per 100,000 of the population making Pakistan the 95th in the world. [3]

The highest risk factors for road traffic accidents are a distraction while driving, not following the right path, and high speeds. Generally, high speed increases the risk of an incident and its severity. Pedestrians have a 4.5-fold increased risk to die if hit by a vehicle traveling at high speed. Other risk factors include alcohol and drug intake, the non-use of helmets, and seatbelts, the use of mobile phones, impaired vehicles and roads, inadequate emergency medical treatment, and enforcement of traffic laws [4]. Age and gender are the utmost important risk factors in assessing RTAs. According to gender and age, young males have been reported to be more prone to this. [5,6] Hence, it is important to understand RTA fatalities in terms of age and gender-based variation occurring in the populated cities of Pakistan to identify the population at risk and implement safety measures. RTAs can also be classified based on the anatomical cause of death and site of fracture. RTA fatalities are more prone to head and cerebral injuries. [5-7] The highest proportion of traumatic head injuries was sustained by pedestrians, followed by cyclists, car occupants, and motorcyclists. It was observed that sub-

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dural and subarachnoid hematomas were more frequent in pedestrians and cyclists, followed by motorcyclists and car occupants because of a direct hit of the skull to the road. In motorcyclists, top fracture of neurocranium is very common. Different regions have different types of victims of RTA.

It depends on the types of vehicles used, traffic safety rules, public awareness, and the condition of the road. Such information enables medical practitioners in casualty departments to recognize the severity of RTA cases and provide quick and accurate medical care. It has been observed that after trauma from RTA many people had psychological effects. of these, some had long-lasting effects which deteriorated the quality of their lives. This study will add new data for the pattern of injuries in road traffic accidents in Peshawar. Previously, no such study in this region is available.

The data would be helpful for Forensic Experts, Public Health Experts, and Law Enforcement agencies to cover and cope with the evil of Road Traffic Accidents. The data further can be used to aware the public has the maximum preventive measures to avoid major fatal injuries in the future. Additionally, laws and legislation can be amended based on the data. To assess the pattern of injuries in autopsy examination of road traffic accident cases at Peshawar.

MATERIALS AND METHODS

This cross-sectional chart review was conducted at the Department of Forensic Medicine, Khyber Medical College, Peshawar from 1st July 2020 to 30th June 2021. All the cases reported in the department during the period were enrolled in the study. All Road Traffic Accidents (RTAs) of any age and gender were included and cases with incomplete documentation or being referred from other districts were excluded.

The data as per the study sample shall be collected after taking Ethical/Institutional approval for the said study. After following principle guidelines, maintaining the ethical concerns and confidentiality of the participant, a pre-designed autopsy Performa shall be used to extract the data.

The pre-designed Performa will have a demographic component and closed-ended questions regarding the pattern of injuries in road traffic accident cases. The data will be extracted in Microsoft Excel software for analysis. SPSS v.25.0 was used to analyze the data. Categorical variables will be analyzed descriptively in the form of frequency and percentages while numerical variables will be analyzed descriptively in the form of mean and stand deviation.

Post stratification two categories will be associated by Chi-Square Test. Analysis will be presented in the form tables and figures. The patterns of injuries included the types, sites, dimensions, duration, and fatal injuries.

RESULTS

A total of 94 cases were included in the study, out of which 93.6% (88/94) were males and 6.4% (6/94) were females. The age of the subjects was ranging from 2-80 years with a mean age of 36.9 ± 20.7 years. The group-wise distribution is given in Table 1. In total 94 cases of road traffic accidents, minimum of 1 and maximum of 6 injuries were noted, where 3.2% (3/94) had a single injury and 96.8% (91/94) had multiple injuries, with a maximum frequency of 2 injuries, of all kinds.

Table 2 shows the frequency of different types of injuries in the total cases. In the cases, of the subjects with single injuries, 2 out of 3 had head & neck injuries, whereas 1 had a pelvic injury.

However, cases with multiple injuries include different regions given their frequencies and percentages in table 3. Moreover, overall 94 cases had a total number of 303 injuries, out of which 90.76% (275/303) were small-sized, 7.92% (24/303) were medium-sized and 1.32% (4/303) were large sized including all kinds of injuries.

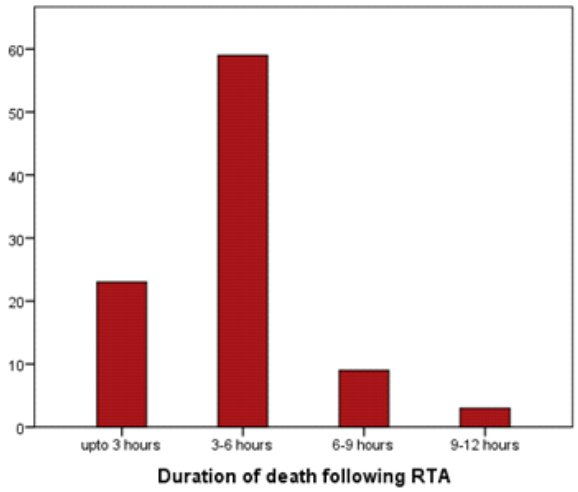

Fig 1: Frequencies illustrating duration of death following RTA

Table 1: Group-wise distribution of our subjects (n=94)

Sr. No	Age (in groups)	Number	Percentage (%)
1.	< 11 years	8	8.5
2.	11-20 years	16	17.0
3.	21-30 years	26	27.7
4.	31-40 years	12	12.8
5.	41-50 years	7	7.4
6.	51-60 years	8	8.5
7.	> 60 years	17	18.1

Table 2: Frequencies and percentages of different types of injuries

Sr. No	Type of injury	Present (%)
1.	Abrasion	56 (59.6)
2.	Contusion	48 (51.1)
3.	Laceration	82 (87.2)
4.	Hematoma	2 (2.1)
5.	Fracture	22 (23.4)

Table 3: Frequencies and percentages of different types of regional injuries

Sr. No	Regional Injuries	Frequencies	Percentages
1.	Head & Neck Injures	81	86.17
2.	Lower Extremity Injuries	58	61.70
3.	Upper Extremity Injuries	33	35.11
4.	Abdomen & Pelvis Injuries	27	28.72
5.	Thorax Injuries	22	23.40

Table 3: Frequencies and percentages of different types of regional injuries

Sr. No	Cause of death	Frequencies	Percentages
1.	Injury to brain and associated vessels	61	64.89
2.	Injury to femoral vessels	11	11.70
3.	Injury to thoracic/abdominal aorta or both	8	8.51
4.	Injury to brain and femoral vessels	5	5.32
5.	Injury to brain and thoracic viscera	5	5.32
6.	Injury to abdominal viscera and associated vessels	2	2.13
7.	Injury to thoracic viscera and associated vessels	1	1.06
8.	Injury to brain and abdominal viscera	1	1.06

Table 4: Correlation between the pattern of injuries and cause of death

Sr. No	Cause of death		Abrasion		Contusion		Laceration		Hematoma		Fracture	
			Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	Injury to brain and associated vessels	Count	37	24	31	30	56	5	1	60	15	46
		Exp. Count	36.3	24.7	31.1	29.9	53.2	7.8	1.3	59.7	14.3	46.7
2	Injury to femoral vessels	Count	5	6	6	5	8	3	0	11	4	7
		Exp. Count	6.6	4.4	5.6	5.4	9.6	1.4	.2	10.8	2.6	8.4
3	Injury to thoracic/abdominal aorta or both	Count	3	2	1	4	4	1	1	4	3	2
		Exp. Count	3.0	2.0	2.6	2.4	4.4	.6	.1	4.9	1.2	3.8
4	Injury to brain and femoral vessels	Count	4	4	4	4	7	1	0	8	0	8
		Exp. Count	4.8	3.2	4.1	3.9	7.0	1.0	.2	7.8	1.9	6.1
5	Injury to brain and thoracic viscera	Count	1	0	0	1	1	0	0	1	0	1
		Exp. Count	.6	.4	.5	.5	.9	.1	.0	1.0	0.2	0.8
6	Injury to abdominal viscera and associated vessels	Count	2	0	1	1	1	1	0	2	0	2
		Exp. Count	1.2	.8	1.0	1.0	1.7	.3	.0	2.0	0.5	1.5
7	Injury to thoracic viscera and associated vessels	Count	4	1	4	1	4	1	0	5	0	5
		Exp. Count	3.0	2.0	2.6	2.4	4.4	.6	.1	4.9	1.2	3.8
8	Injury to brain and abdominal viscera	Count	0	1	1	0	1	0	0	1	0	1
		Exp. Count	.6	.4	.5	.5	.9	.1	.0	1.0	0.2	0.8
		P-value	0.58		0.57		0.48		0.30		0.18	

DISCUSSION

Road traffic accidents are one of the major causes of morbidity and mortality among humans. It is believed to be the fifth leading cause of death within the next 10 years. It was important in our setting to determine the various aspects of RTAs presenting to trauma centers in Peshawar. Our study showed a total of 93.6% males and 6.4% females involved in RTAs presenting to trauma and emergency. This can be attributed to a lot of known factors that increase a male susceptibility to be involved in RTAs. Similar findings were noted in a study done in Yazd, Iran by Yashar et al.[9] which showed 80.5% of males and

19.5% of females were involved in RTAs. Our results are also in accordance with a similar study done in Karachi, Pakistan by Khurshid, A. et.al[10] which showed 85.8% male and 14.2% female involvement.

Age-wise distribution of patients showed the majority of them occurring in the age group 21-40 years (40.5%). A similar study showed 54.5% of patients in the age group 18-40 [10]. The difference in reference range can be attributed to the different age group ranges used in both studies. With respect to the number of injuries occurring in each patient that presented with RTA, the majority of patients had multiple injuries amounting to 96.8% whereas 3.2% of patients had single injuries. In comparison to this, two similar studies done in India and Ghana respectively showed results in close accordance with our results [(11-12)]. Variation in results can be attributed to multiple factors including abiding by traffic laws, use of protection on roads such as wearing a helmet, and seat belt use and strictly following the speed limitations individually.

Regionally, our study indicated that most injuries that occurred were located in the head and neck region accounting for 86.17% of patients. This was followed by lower and upper extremity injuries occurring in 61.7% and 35.11% of injuries respectively. Comparing it to a similar study done in Saudi Arabia [13], showed lower limb injuries occurred in 40.77% of patients, upper limb in 38.08% of patients, and skull injuries occurred in 7.21%. The difference in statistical findings can be attributed to the use of protective gear being more prevalent in Saudi Arabia compared to our study population.

The most common cause of death from RTA occurred due to the brain and associated vessel injury in our study accounting for 64.89% of total deaths. This finding is in accordance with a similar study done in Karachi, Pakistan [(10)] which showed deaths from injury to the brain and skull accounting for 64.6% of all fatalities. Comparatively, our study finding was in discordance with a similar study done in India which showed only 47% of deaths occurred from the head and associated injuries [14]. Thus, correlating the pattern of the injuries with the cause of death showed p-values above 0.05, which signifies that there is no impact on each other. No such relation is conducted in the region.

CONCLUSION

Our study shows the pattern of injuries and causes of death via RTA, as there is no study conducted in this region. It will be useful to Law Enforcement agencies in implementing rules and regulations in preventing RTA and public awareness.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Nadeem F: Concept, design, data collection

Wasif M: Data collection, writing, review

baqi NU: Data collection, review

Ahmad I: Concept, review

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.