

## Frequency of Profiling of Forensic Autopsies

AISHA RASHEED<sup>1</sup>, NASEEM AKHTAR<sup>2</sup>, ISHTIAQUE ALI LANGAH<sup>3</sup>, IJAZ AZIZ<sup>4</sup>, SONO MAL<sup>5</sup>, AZRA ANWAR<sup>6</sup>

<sup>1</sup>Assistant Professor of Forensic Medicine and Toxicology, Liaquat University of Medical & Health Sciences, Jamshoro Sindh, Pakistan

<sup>2</sup>Senior Lecturer, Department of Anatomy, Sindh Medical College, Jinnah Sindh Medical University, Karachi Sindh, Pakistan

<sup>3</sup>Assistant Professor, Department of Forensic Medicine, Loralai Medical College, Loralai, Baluchistan

<sup>4</sup>Assistant Professor, Department of Forensic Medicine, Mekran Medical College, Turbat, Baluchistan

<sup>5</sup>Associate Professor, Department of Forensic Medicine, Sindh Medical College, Jinnah Sindh Medical University, Karachi, Sindh, Pakistan

<sup>6</sup>Lecturer, Department of Forensic Medicine, Ziauddin University, Karachi Sindh, Pakistan

Correspondence to Dr. Ijaz Aziz, E-mail: [ijazaziz62@gmail.com](mailto:ijazaziz62@gmail.com) Cell: 03134344367

### ABSTRACT

**Aim:** To identify the profiling of medicolegal autopsies.

**Study design:** Prospective observational study.

**Place and duration of study:** Medicolegal Section, Liaquat University Hospital, Hyderabad from 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2019.

**Methodology:** Nine hundred and eighty two autopsies of medicolegal nature were performed over a period of five years. The data was collected from forensic autopsy reports and was recorded with the consent of close relatives.

**Results:** Majority of the subject was male (78.92%) and belonged to age group of  $\geq 19$  to  $< 60$  years. The number of subjects reported from urban locality (67.61%) was higher than rural areas (32.39%). The distribution of causes of deaths showed major contribution of road traffic accidents (45.32%) followed by fire arm injury (16.70%), asphyxia (15.31%), train accident (3.46%), and poisoning (1.83%). All of the causes of deaths were higher in males and within age group of adults. Most of the medicolegal nature casualties were reported from urban areas of the region. The number of forensic autopsies was highest in summer season (40.12%).

**Conclusion:** The males outnumbered the females in medicolegal autopsies. The road traffic accidents had highest frequency of causing deaths in both genders and in all age groups irrespective of locality and seasons.

**Keywords:** Forensic autopsy, road traffic accident, fire arm injury, asphyxia, seasons

### INTRODUCTION

The accurate determination of cause of death possesses an immense importance not only for family and relatives on individual level but also facilitates health care planning on population level.<sup>1</sup> For medicolegal purpose, the cause and manner of death are established along with time since death and identity of the deceased. The resultant information works as evidence to support law-enforcement procedures. Autopsy is a scientific method to identify the cause of death through examining the whole surface, organs, and cavities of the body.<sup>2</sup> The clinical autopsy is performed for diagnosis of disease and is considered an important tool for quality assessment in healthcare.<sup>1</sup> Whereas, the autopsies are termed as medicolegal for the cases in which the law enforcement agencies have aspect of interest to confirm or prevent suspicions with reference to criminal offences.<sup>2</sup> The autopsy is also performed often in cases where the cause is believed to be unnatural and is suspicious of being accidental, suicidal, or homicidal in nature.<sup>3</sup> The study of frequency and pattern of the unnatural deaths is important to determine the mortality statistics with aspects of unnatural deaths in a specific region. Moreover, the profiling of medicolegal cases can also contribute to minimize the rate of preventable casualties in future.<sup>4</sup>

The findings of this study could be helpful to understand the incidence of unnatural deaths in the region and could help the public health policy makers, government bodies, and law-enforcement authorities to plan and implement the strategies that can avoid the preventable causes of unnatural deaths.

### MATERIALS AND METHODS

After permission from IRB, the present observational study was prospectively conducted at Medicolegal Section of Liaquat University Hospital, Hyderabad, Sindh, Pakistan over a period of five years from 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2019. Various parameters such as gender, age, address, reporting police station, and cause of death were obtained from autopsy reports and were recorded in a designed data collection sheet after getting consent from close relatives of the deceased. The autopsy reports of medicolegal nature were included in this study for profiling whereas the non-medicolegal autopsies were excluded. Causes of

death were broadly categorized as road traffic accidents, train accidents, fire arm injury, assault, asphyxial death, poisoning, and electric shock. The cause of death was classified as 'other' if it could not fit into mentioned categories. The data was entered and analyzed through SPSS-24.

The objective of the study was to identify the profiling of medicolegal autopsies.

### RESULTS

There were 775 males and 207 females. The age of deceased ranged from one year to 85 years with mean age of 33.06 years. The highest frequency of both males (74.71%) and females (71.50%) belonged to age group between 18 and 60 years old followed by teens (10.29%) and children (8.45%). The least number of autopsies was observed in children with age from 1 to 12 years. The categorization of locality into urban and rural showed that a significant portion i.e. approximately 70%, of the medicolegal autopsies was performed for deceased belonging from urban localities. With reference to seasonal fluctuations, the medicolegal autopsies performed were maximal in summer season irrespective of gender, age groups, and locality (Table 1).

The road traffic accident was concluded in 45% of the studied medicolegal autopsies and was found to be the leading cause of death in this study. The occurrence of road traffic accident was highest in adults (71.69%), in urban locality (68.76%), and during summer season (40.32%). The fire arm injury was second most prominent cause of death followed by asphyxia, assault, train accident, and electric shock (Table 2). Most of the causes of death were higher among adult males belonging from urban locality. After adults, the teenage group had higher frequencies of road traffic accidents, fire arm injury, assault, and electric shock than children and elderly. However, the number of asphyxial deaths was higher in children in comparison to teens. On the other hand, the frequency of poisoning was found equal in both children and teens age groups. The road traffic accident, asphyxia, poisoning, and electric shock were least causatives of deaths in elderly. Only 9 and 17 autopsies remained undetermined and reserved, respectively, out of total 982 autopsies

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Table 1: Frequencies of medicolegal autopsies with different variables

Characteristics	Male (n=775)		Female (n=207)		Total(n=982)		P value
	No.	%	No.	%	No.	%	
<b>Age (years)</b>							
Children (1 - 12)	59	7.61	24	11.59	83	8.45	0.167
Teens (13 - 18)	77	9.94	24	11.59	101	10.29	
Adults (≥19 - <60)	579	74.71	148	71.50	727	74.03	
Elderly (≥60)	60	7.74	11	5.31	71	7.23	
<b>Locality</b>							
Urban	524	67.61	157	75.85	681	69.35	0.02
Rural	251	32.39	50	24.15	301	30.65	
<b>Season</b>							
Winter	178	22.97	53	25.60	231	23.52	0.28
Spring	148	19.10	41	19.81	189	19.25	
Summer	324	41.81	72	34.78	396	40.33	
Autumn	125	16.13	41	19.81	166	16.90	

Table 2: Causes of deaths against various variables

Variable	Causes of Deaths																		P value		
	Road traffic accident (n=445)		Fire arm injury (n=164)		Asphyxial death (n = 150)		Assault (n=78)		Train accident (n = 34)		Poisoning (n = 18)		Electric shock (n = 12)		Others (n = 55)		Undetermined (n = 9)			Reserved (n = 17)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		No.	%
<b>Gender</b>																					
Male	345	77.53	142	86.59	109	72.67	63	80.77	30	88.24	8	44.44	9	75.00	51	92.73	7	77.78	11	64.71	<0.00
Female	100	22.47	22	13.41	41	27.33	15	19.23	4	11.76	10	55.56	3	25.00	4	7.27	2	22.22	6	35.29	1
<b>Age (years)</b>																					
1-12	42	9.44	6	3.66	19	12.67	3	3.85	1	2.94	2	11.11	2	16.67	3	33.33	2	11.76	3	5.45	<0.00
13-18	57	12.81	9	5.49	17	11.33	8	10.26	2	5.88	2	11.11	3	25.00	0	0.00	0	0.00	3	5.45	
≥19-60	319	71.69	142	86.59	109	72.67	60	76.92	28	82.35	14	77.78	7	58.33	4	44.44	12	70.59	32	58.18	
≥60	27	6.07	7	4.27	5	3.33	7	8.97	3	8.82	-	-	-	-	2	22.22	3	17.65	17	30.91	
<b>Locality</b>																					
Urban	306	68.76	111	67.68	83	55.33	63	80.77	22	64.71	17	94.44	9	75	7	77.78	15	88.24	48	87.27	<0.00
Rural	139	31.24	53	32.32	67	44.67	15	19.23	12	35.29	1	5.556	3	25	2	22.22	2	11.76	7	12.73	1
<b>Seasons</b>																					
Winter	110	24.72	48	29.27	21	14	14	17.95	6	17.65	6	33.33	2	16.67	1	11.11	8	47.06	15	27.27	<0.00
Spring	86	19.33	26	15.85	41	27.33	16	20.51	6	17.65	1	5.556	1	8.333	1	11.11	2	11.76	9	16.36	
Summer	181	40.67	63	38.41	56	37.33	34	43.59	15	44.12	4	22.22	8	66.67	4	44.44	4	23.53	27	49.09	
Autumn	68	15.28	27	16.46	32	21.33	14	17.95	7	20.59	7	38.89	1	8.333	3	33.33	3	17.65	4	7.27	

## DISCUSSION

The gender-wise distribution of the present study showed a higher proportion of males as compared to the females. A three-year retrospective study from India determined the pattern of medicolegal autopsies and observed greater percentage of males (71.46%) than females (28.53%)<sup>5</sup> Similar gender distribution in medicolegal autopsies was reported by Radhakrishna et al<sup>3</sup> from India, by Afandi<sup>2</sup> from Indonesia, by Abdellah et al.<sup>6</sup> from Egypt, and by Larsen and Lynnerup<sup>7</sup> from Denmark. Patel et al<sup>8</sup> reported that in their study of medicolegal autopsies the number of females dominated the number of males in age group of 11-20 years. In present study, the number of males was higher in all age groups and the observation is consistent with previously published studies from neighbouring countries implying the regional influence on gender and age distribution among medicolegal autopsies<sup>3,5,9</sup>.

The highest incidence of road traffic accident as cause of death may be attributed to thick density of the city with reference to population and increased number of vehicles on congested roads.<sup>10</sup> Failing to adhere to traffic rules, untrained and unlicensed drivers, over speeding, under-age driving, one-wheeling, improper road conditions, and unfit vehicles are important factors that impact road traffic accidents in Pakistan.<sup>10-12</sup> A provincial analysis of traffic accidents in Pakistan reported highest number of fatal road injuries for Sindh next to Punjab province.<sup>13</sup> Although an year wise increase in road traffic accidents was not observed in present study, other studies have reported a rising trend in road accidents in Pakistan<sup>14</sup>.

A case study of environmental factors influencing road traffic accidents in Pakistan identified the need of extreme care while driving on roads during extreme weather as the relevancy of road traffic accidents could be established with intense heat, severe cold, rainfall, and the fog in both urban and rural settings<sup>11</sup>. The present study also shows that the road traffic accidents were higher in summer which is characterized by hot climate often going to extreme highs of 40°C, and rainfalls. Similarly, the road traffic accidents were higher in winter than spring and autumn as the fog usually forms during winter in most parts of Sindh and other parts of Pakistan.<sup>15</sup> Contrarily, the seasonality of deaths with reference

to cause has been significantly associated with winter peaks in comparatively colder regions of Pakistan.<sup>16</sup> However, as regions of Sindh province experience severity in hot weather rather than cold, the observation of present study may be consistent with increase in road injuries associated with extreme summers.

The present study shows that firearm injuries, asphyxial deaths, and assaults followed the frequency of road traffic accidents as causes of deaths (Table 2). The homicidal and suicidal deaths have been reported from other studies as most obvious causes of deaths after road traffic accidents.<sup>3,5</sup> Conversely, the incidence of firearm injuries leading to death has even been reported to be higher than road traffic accidents in medicolegal autopsies conducted at Faisalabad which is third largest city of Pakistan<sup>10</sup>. These findings may suggest that the causes of deaths may vary between different regions of a country. It has been also reported that a major portion of firearm injuries is homicidal in nature rather than suicidal<sup>10,17,18</sup>.

The frequency of poisoning in medicolegal autopsies of current study in addition to transportation related deaths, firearm injuries, asphyxia, assault, and electric shock highlights the need of increasing safety awareness and social tolerance among the community. Further studies are recommended to explore the factors related to the pattern of causes of deaths identified in the present study.

## CONCLUSION

The frequency of most of the causes of deaths were higher in adult males from urban locality and during summer season

**Conflict of interest:** Nil

## REFERENCES

1. Friberg N, Ljungberg O, Berglund E, Berglund D, Ljungberg R, Alafuzoff I, et al. Cause of death and significant disease found at autopsy. *Virchows Arch* 2019;475(6):781-8.
2. Afandi D. Profile of medicolegal autopsies in Pekanbaru, Indonesia 2007-2011. *Malays J Pathol* 2012;34(2):123-6.

3. Radhakrishna K, Makhani C, Sisodiya N, Chourasia S, Sarala M, Khan R. Profile of medicolegal autopsies conducted at tertiary medicolegal centre in South Western India. *Int J Healthc Biomed Res* 2015;3(2):70-5.
4. Bhabhor R, Parmar A. Profile of medicolegal autopsies at a tertiary centre in bhavnagar region. *J Indian Forensic Sci* 2018;40(4):383-6.
5. Prasad KJ, Venkatesulu B, Khalid MA. Pattern of medicolegal autopsies conducted at Tirupati, Andhra Pradesh: A 3-year retrospective study. *Asian J Pharm Clin Res* 2021;14(12):3.
6. Abdellah N, Ghandour N, Ali H. A retrospective study of autopsy cases carried out in Qena, Luxor and Aswan governorates, Upper Egypt during the Period of 2008–2011. *Zagazig J Forensic Med* 2018;16(1):76-90.
7. Larsen ST, Lynnerup N. Medico-legal autopsies in Denmark. *Dan Med Bull* 2011;58(3):A4247.
8. Patel S, Tomar JS, Jain AP, Patel P. Profile of Medicolegal Autopsies Conducted at Bundelkhand Medical College, Sagar (MP). *Prof. (Dr) RK Sharma* 2020;20(4):550.
9. Gupta S, Panchal R, Sondarva D. An approach to sudden natural deaths in medicolegal autopsies at Karamsad, Gujarat. *J Indian Forensic Sci* 2011;33(1):30-2.
10. Naheed K, Nadeem S, Iqbal M, Qasim AP, Sadia S, Siddiqui BA. Medicolegal autopsies:: audit of medicolegal autopsies in Faisalabad city. *Professional Med J* 2019;26(05):696-701.
11. Hammad HM, Ashraf M, Abbas F, Bakhat HF, Qaisrani SA, Mubeen M, et al. Environmental factors affecting the frequency of road traffic accidents: a case study of sub-urban area of Pakistan. *Environ Sci Poll Res* 2019; 26(12):11674-85.
12. Hussain T, Shu L, Sosorburan T, Adji AS, Khan AH, Raja A. Road traffic accidents: an observational and analytical study exploring the hidden truths in Pakistan and South East Asian countries. *Healthline* 2011;2(1):52-7.
13. Gulzar S, Yahya F, Mir Z, Zafar R. Provincial analysis of traffic accidents in Pakistan. *Acad Res Int* 2012;3(3):365.
14. Imran M, Nasir JA. Road Traffic Accidents: Prediction in Pakistan. *Professional Med J* 2015;22(06):705-9.
15. Yasmeen Z, Rasul G, Zahid M. Impact of aerosols on winter fog of Pakistan. *Pak J Meteorol* 2012;8(16).
16. Asif M, Nawaz K, Zaheer Z, Thygesen H, Abu-Shaheen A, Riaz M. Seasonality of deaths with respect to age and cause in Chitral District Pakistan. *Plos one* 2019;14(12):e0225994.
17. Mirza C, Khan A, Malik L, Malik M, Parveen K. An autopsy based study of pattern of firearm injuries in Karachi, Pakistan. *Emergency Med* 2013;3(165):2-7.
18. Nwafor CC, Akhiwu WO. Profile of Medicolegal Deaths in Females: An Autopsy-Based Study. *Nigerian Med J* 2019;60(6):300-5.