

July - December 2022

Volume 31

Issue 2

PRINT ISSN: 2277-1867

ONLINE ISSN: 2277-8853



JOURNAL OF FORENSIC MEDICINE SCIENCE AND LAW

Official Publication of Medicolegal Association of Maharashtra

Editor-in-chief

Dr Ravindra Deokar

Associate Editors

Dr Sadanand Bhise

Dr Sachin Patil

**MULTISPECIALITY, MULTIDISCIPLINARY, NATIONAL
PEER REVIEWED, OPEN ACCESS, MLAM (SOCIETY) JOURNAL
Indexed with Scopus (Elsevier) & Index Copernicus (Poland)**

Editorial Office Address

Department of Forensic Medicine & Toxicology, Third Floor, Library Building, Seth G S Medical College & KEM Hospital, Parel, Mumbai, Maharashtra, India. Pin-400 012. Email id: mlameditor@gmail.com Phone: 022-24107620 Mobile No. +91-9423016325.



JOURNAL OF FORENSIC MEDICINE SCIENCE AND LAW

(Official Publication of Medicolegal Association of Maharashtra)

Email.id: mlameditor@gmail.com

PRINT ISSN:
2277-1867

ONLINE ISSN:
2277-8853

Original Research Article

Injuries in Riders and Pillion Riders of Fatal Two Wheeler Road Traffic Accidents in Raichur, Karnataka

Sidramappa Gouda^a, Gopinath M^b, Sharanabasavappa Karaddi^{c*}, Suraj^b

^aAssociate Professor, ^bAssistant Professor; Department of Forensic Medicine, Navodaya Medical College, Raichur, Karnataka, India. ^cAssociate Professor, Department of Forensic Medicine, Raichur Institute of Medical Sciences, Raichur, Karnataka, India.

Article Info

Received on: 04.10.2021

Accepted on: 15.05.2022

Key words

Road traffic accidents,
Two-wheeler,
Pillion rider,
Rider.

Abstract

Background: As two-wheelers have become more popular in the absence of public transport, the number of road accidents is also growing. This has become a major issue and an epidemiological concern. **Materials and methods:** A retrospective study was conducted to include all deaths due to two-wheeler accidents involving riders and pillion riders from 1.1.2017 to 31.12.2019. A pretested Performa was used to determine the nature of the incident and the type of vehicle involved. In all 267 cases, autopsy findings were recorded and analyzed. **Results:** Fatal two-wheeler accidents constituted about 71.58% of total fatal road traffic accidents (RTA) during these three years, and 52.80% of them occurred between 6PM and 12PM. The majority of them were between the ages of 21 and 30. Abrasion in the upper limb, contusion and laceration on the head were the most common injuries documented. 59 (39.3%) and 78 (66.6%) of the fatalities were due to skull fractures among riders and pillion riders, respectively. Laceration of the brain was the most common injury found among all internal organ injuries. **Conclusion:** Around three-fourths of the RTA's were two-wheeler accidents. Strict enforcement of laws, improving the roads, and strengthening health care facilities will reduce two-wheeler RTA's.

1. Introduction

Two-wheeler riders' deaths in crashes have more than doubled in a decade, between 2009 and 2019, as these vehicles with the least protective features for occupants have become more popular as they are the most affordable and easiest mode of transport. The trend is almost similar in the case of occupants of cars and jeeps, though the numbers are much bigger in the case of two-wheeler occupants. The comparative analysis of the 10 years data of the National Crime Record

Bureau (NCRB) shows that the share of two-wheeler occupants deaths has increased on a year-on-year basis.¹

Rising fuel prices have also forced people to use two-wheel-drive vehicles as a means of transportation, after which accidents involving two-wheeled vehicles have become commonplace. At least 20 people sustained non-fatal injuries for each person who died in a street traffic crash. These accidents may have had a sizable impact on

How to cite this article: Gouda S, Gopinath M, Karaddi S, Suraj. Injuries in Riders and Pillion Riders of Fatal Two Wheeler Road Traffic Accidents in Raichur, Karnataka. J For Med Sci Law 2022;31(2):15-18.

*Corresponding author: Dr. Sharanabasavappa Karaddi, Associate Professor, Department of Forensic Medicine, Raichur Institute of Medical Sciences, Raichur, Karnataka, India. Email id: sharankaraddi@rediffmail.com

lifestyles and frequently entail tremendous economic fees.² This paper aims to examine a pattern of critical street accidents involving two-wheeler riders and pillion riders so that it will offer more current records on extreme bike injuries in terms of crash configurations and injury causes.

2. Materials and methods:

A retrospective study was conducted in the Department of Forensic Medicine, Navodaya Medical College and Hospital, Raichur. After getting permission from the head of the institute and approval from the Ethical Committee, RIMS, Raichur, all the autopsies conducted from 1st January 2017 to 31st December 2019 at RIMS mortuary were analysed. Out of 1028 autopsies conducted during this 3-year study period, 417 (40.56%) were due to road traffic accidents, out of which 267 (25.97%) were two-wheeler accidents. Data was collected from 267 autopsy reports and analysed. Autopsies where the nature of the incident could not be ascertained were excluded. A copy of the inquest report was used to extract information regarding the nature of the incident and the type of vehicle involved in the accident.

The data was tabulated and analyzed using Microsoft Excel. Frequencies and percentages were calculated for all the variables separately for riders and pillion riders.

3. Results:

Out of the total 1028 autopsies conducted during the study period, road traffic accidents constituted 417(40.56%). Of these, 267 cases (25.97%) involved two-wheeler riders and pillion riders. Fatal riders constituted 150(56.17%) while rest 117(43.82%) victims were pillion riders. Male victims

(70.41%) outnumbered females (29.58%) in both groups. Majority of victims were from age group 21–30 years (34.08%) (**Table 1**).

Table 1: Gender and age distribution of two-wheeler road traffic accidents. (n=267)

Variable	Riders	Pillion riders	Total
Gender			
Males	119	69	188 (70.41%)
Females	31	48	79(29.58)
Age			
00 - 10	0	09	09 (3.37%)
11 – 20	17	13	30 (11.23%)
21 – 30	58	33	91 (34.08%)
31 - 40	28	13	41 (15.35%)
41 – 50	25	18	43 (16.10%)
51 - 60	13	17	30 (11.23%)
61 – 70	07	09	16 (5.99%)
71 – 80	02	05	07 (2.62%)
81 - 90	00	00	00
Total	150	117	267 (100)

Majority of two-wheeler accidents 125(46.81%) occurred in rainy season followed by winter season 81(30.33%). Most of the 2-wheeler lethal accidents 141(52.80%) occurred between 6 pm to 12 pm as shown in **Table 2**.

Table 2: Distribution of two-wheeler road traffic accidents according to season and timing. (n=267).

Season	Riders	Pillion riders	Total
Summer	30	31	61(22.84%)
Rainy	72	53	125(46.81%)
Winter	48	33	81(30.33%)
Timing			
12 AM – 06 AM	11	07	18(06.74%)
06 AM – 12 PM	23	38	61(22.84%)
12 PM – 06 PM	38	09	47(17.60%)
06 PM – 12 PM	78	63	141(52.80%)

Table 3: Showing external injuries among riders and pillion riders. (n=267).

Parts involved	Abrasion		Contusion		Laceration	
	Riders	Pillion riders	Riders	Pillion riders	Riders	Pillion riders
Head	15(10%)	14(11.9%)	61(40.6%)	53(45.2%)	33(22%)	29(24.7%)
Face	33(22%)	35(29.9%)	18(12%)	13(11.1%)	51(34%)	29(24.7%)
Neck	12(08%)	04(03.4%)	03(02%)	02(01.7%)	04(02.6%)	03(02.5%)
Chest	49(32.6%)	41(35.04%)	51(34%)	26(22.2%)	07(04.6%)	02(01.7%)
Abdomen	21(14%)	28(23.9%)	13(08.6%)	08(06.8%)	06(04%)	05(04.2%)
Upper limb	55(36.6%)	67(57.2%)	09(06%)	08(06.8%)	13(08.6%)	11(09.4%)
Lower limb	49(32.6%)	45(38.4%)	05(03.3%)	07(05.9%)	24(16%)	29(24.7%)

Contusion and laceration over the head and abrasion over upper limb was common external injury sustained in both groups (**Table 3**).

Majority of the deceased had lethal skull bone fracture among both riders and pillion riders (**Table 4**) Most of the cases of riders and pillion rider's brain

was commonly injured internal viscera followed by spleen (Table 5).

4. Discussion:

Two-wheeler accidents accounted for 25.97% (267 cases) of those killed in road accidents. Similar findings were seen in a study conducted by Devi *et al.*³ Most fatal riders and pillion riders were from the age group of 21–30 years (34.08%), similar to the findings of Devi *et al.* and Ghosh.⁴ As this age group leads an active and adventurous lifestyle with more mobility, they frequently expose themselves to traffic hazards. Our study found a male to female ratio of 2.3: 1, which differs from the results of Salgado and Colombage⁵, Adeyemo *et al.*⁶ (4.43:1), and Devi *et al.*³ (9.2:1). outdoor activities of females in this

competitive world could be a reason for an increase in female fatalities due to traffic accidents. Peak two-wheeler fatal road accidents were in the rainy season, 125 (46.781%), which was similar to the study by Kumar *et al.*⁷

Table 4: Showings fractures among riders and pillion riders. (n=267).

Body parts	Riders	Pillion riders
Skull	59(39.3%)	78(66.6%)
Face	31(20.6%)	23(19.6%)
Neck	01(00.6%)	02(01.7%)
Thorax	48(32.0%)	21(17.9%)
Pelvis	21(14.0%)	06(05.1%)
Upper limb	13(08.6%)	03(02.5%)
Lower limb	33(22.0%)	11(09.4%)

Table 5: Showing injuries to the organs among riders and pillion riders. (n=267).

Viscera	Riders		Pillion riders	
	Contusion	Laceration	Contusion	Laceration
Brain	23(15.3%)	48(32%)	15(12.8%)	61(52.1%)
Lungs	30(20%)	44(29.3%)	13(11.1%)	18(15.3%)
Pleura	05(03.3%)	44(29.3%)	08(06.8%)	20(17%)
Heart	05(03.3%)	04(02.6%)	03(02.5%)	09(07.6%)
Pericardium	04(02.6%)	05(03.3%)	04(03.4%)	12(10.2%)
Great vessels	03(02%)	13(08.6%)	05(04.2%)	17(14.5%)
GI Track	07(04.6%)	03(02%)	04(03.4%)	21(17.9%)
Liver	13(08.6%)	38(25.3%)	08(06.8%)	31(26.4%)
Spleen	09(06%)	43(28.6%)	06(05.1%)	33(28.2%)
Mesentery	06(04%)	23(15.3%)	07(05.9%)	16(13.6%)
Kidney	13(08.6%)	09(06%)	15(12.8%)	07(05.9%)
Urinary bladder	02(01.3%)	11(07.3%)	01(0.8%)	07(05.9%)

This was in contrast to a study by Bairagi *et al.*,⁸ who found the majority of the two-wheeler RTAs were in the spring season. Increased alcohol consumption, overcrowding on the streets, and rash driving on damaged and poorly maintained roads in the rainy season may be the causes of leading fatalities this season. Most two-wheeler accidents occurred between 6 p.m. and 12 p.m., accounting for 141 cases (52.80%). This may be due to inefficient lighting, traffic congestion, many people returning home from work in the evening, drinking alcohol in the middle of the night, etc. These results are consistent with Sevit S⁹ and Kumar A *et al.*⁷

Fracture of the skull was most commonly seen in riders 59 (39.3%) and pillion riders 78 (66.6%) of all motorcycle fatal accidents, which was similar to the study results of Devi *et al.*³ A study conducted by

Arun Prakash *et al.*¹⁰ found that head and neck injuries were more common among two-wheeler riders. Another study conducted by Brinda and Ranjan also showed similar findings.¹¹

Wearing helmets might have prevented skull fracture and fatality in riders, a practice rarely practiced by pillion riders, thus predisposing them to more head injuries. Lower limb bones fracture was commonly seen in riders 33(22.0%) followed by skull fracture. Our study showed that, among all internal organs, brain laceration was the most common injury, involving 48 cases (32%) of riders and 61 cases (52.1%) of pillion riders. Again, not following the traffic rules and not wearing protective headgear while riding a 2-wheeler can be an important cause of these fatalities involving laceration of the brain.

5. Conclusion

Around three-fourth of the RTA's were two-wheeler accidents. Among them, more than half were fatal riders and remaining were among pillion riders. Majority of them had skull fractures and brain was the most common internal organ involved during RTA.

Recommendations:

1. Strict enforcement of laws requiring riders and pillion riders to wear protective head gears are mandatory for two-wheeler drivers.
2. Proper setting and enforcement of speed limits on roads.
3. Making compulsion of having day time running lights for two-wheeler by manufacturing company.
4. Managing existing road infrastructure to promote safety, through provision of safer routes for pedestrians and cyclists.
5. Health facilities should be strengthened to decrease the road traffic fatalities.

Ethical Clearance: IEC approval is taken from the Institutional Ethical committee.

Contributor ship of Author: All authors equally contributed.

Conflict of interest: None to declare.

Source of funding: None to declare.

References:

1. [The times of India. Two-wheeler crash deaths more than double in a decade.2020. \[Cited 25th January 2022\]. Available from: https://timesofindia.indiatimes.com/india/two-wheeler-crash-deaths-more-than-double-in-a-decade/articleshow/77923795.cms](https://timesofindia.indiatimes.com/india/two-wheeler-crash-deaths-more-than-double-in-a-decade/articleshow/77923795.cms)
2. [World Health Organization. Global status report on road safety 2015. World Health Organization; 2015 Dec 17. \[Cited 20th January 2022\]. Available from: https://books.google.co.in/books?hl=en&lr=&id=wV40DgAAQBAJ&oi=fnd&pg=PP1&dq=WHO+World+Health+Organization,+Global+status+report+on+road+safety,+2015+Switzerland.&ots=DKXxDXfXvg&sig=kRzEAP0-1pEgciOqn7Rj5HxaU2M&redir_esc=y#v=onepage&q=WHO%20World%20Health%20Organization%2C%20Global%20status%20report%20on%20road%20safety%2C%202015%20Switzerland.&f=false](https://books.google.co.in/books?hl=en&lr=&id=wV40DgAAQBAJ&oi=fnd&pg=PP1&dq=WHO+World+Health+Organization,+Global+status+report+on+road+safety,+2015+Switzerland.&ots=DKXxDXfXvg&sig=kRzEAP0-1pEgciOqn7Rj5HxaU2M&redir_esc=y#v=onepage&q=WHO%20World%20Health%20Organization%2C%20Global%20status%20report%20on%20road%20safety%2C%202015%20Switzerland.&f=false)
3. Devi TM, Momonchand A, Fimate L. Pattern of injuries in two-wheeler fatal road traffic accidents. *Journal of Medical Society RIMS, Imphal.*1998;12:33-6.
4. Ghosh PK. "A critical observation from the pattern of injury vis-à-vis vehicle and the road users in the city of Delhi" a scientific article XIV annual conference (10-1-92 to 12- 01-92) of Indian Association of Forensic Medicine.
5. Salgado MSL, Colombage SM. Analysis of fatalities in road accidents. *Forensic Sci Int.* 1988;36: 91-6.
6. Adeyemo AO, Arigbabu AO, Adejuyibde O. Thoracic injuries in road traffic accidents: analysis of 148 cases. *Injury.*1984; 14(1): 30-4.
7. Kumar A, Qureshi GU, Aggarwal A, Pandey DN. Profile of thoracic injuries with special reference to road traffic accidents in Agra. *J Indian Acad Forensic Med.*1999; 21(4): 104-9.
8. Bairagi KK, Barbhuiyan SI, Hazarika N. Injuries in riders and pillion riders of fatal two-wheeler road traffic accidents in city of Guwahati. *Indian J Forensic Med Toxicol.*2010;4(2):25-7.
9. Sevitt S. Fatal Road accidents in Birmingham, time to death and their causes. *Injury: The British Journal of Accident Surgery.* 1973;4(4):281-93.
10. Arun Prakash KS, Sanjeev K, Gambhir Singh O. Prospective Studies on Pattern of Two-Wheeler Injuries in Road Traffic Accidents. *Medico-legal Update.*2021;21(1):82-6.
11. Patel B, Parashar R. Study of pattern of injuries sustained by two-wheeler drivers in a tertiary care hospital of Bhopal city. *IP Int J Forensic Med Toxicol Sci.*2020;5(3):95-8.