

“PATTERN AND OUTCOME OF OTOLARYNGOLOGICAL AND FACIAL INJURY IN ROAD TRAFFIC ACCIDENTS AT A TERTIARY CARE CENTRE IN EASTERN NEPAL”

Sanjeev Kumar Thakur^{1*}, Gyan Raj Aryal², Rishikesh Thakur³, Nisha Ghimire⁴

Affiliation

1. Associate Professor, ENT, Nobel Medical College and Teaching Hospital, Biratnagar, Nepal
2. Resident, ENT, Nobel Medical College and Teaching Hospital, Biratnagar, Nepal
3. Lecturer, ENT, Nobel Medical College and Teaching Hospital, Biratnagar, Nepal
4. Associate Professor, Department of Physiology, Nobel Medical College and teaching Hospital.

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Corresponding Author

Dr. Sanjeev Kumar Thakur
Associate Professor
ENT

Nobel Medical College and Teaching Hospital, Biratnagar, Nepal

Email: sanjeevkr055@gmail.com

ORCID No.: <https://orcid.org/0000-0002-2855-1766>

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ABSTRACT

Introduction

Otolaryngological trauma is prevalent in road traffic accidents (RTA), with or without multiple organ injuries.

Objective

The aim was to report the number and pattern of otolaryngological injuries in cases of road traffic accidents (RTA) and their outcome.

Methodology

A prospective study over one year of cases of RTA was done. The pattern and outcome of the otolaryngological and facial injury was recorded.

Result

Out of 90 cases, 69(76.66%) were male, 21 (23.33%) were female. The mean age was 32.33 ± 13 Yrs. The mean time of presentation to emergency was 16.24 ± 19.61 hrs. Motor vehicle accident was more common, 75 (83.33%). Multiple injury was found in 68(75.55%) cases. Among 89 cases with ear problem, common complaints were hearing loss, 20(22.47%), otalgia, 17(19.1%) and laceration of pinna 13(14.6%). Ear complications were seen in 16 (17.97 %) cases. Among 55 cases of nose/face injury, common presentation were epistaxis, 20 (36.36%) and nasal bone fracture, 12 (21.81%). Nasal complications were found in 8 (14.54%) cases. In 32 cases of neck/throat trauma, laceration was found in 11 (34.37%) cases. 4(12.5%) cases had undergone tracheostomy. Complications (stenosis and hoarseness) were found in 6(18.75%) cases. Patients who required admission were 81(90%).

Conclusion

Motor vehicle accidents were more common. It was commoner in male. Ear was most commonly affected by injury and complications. The complication of nose and neck/throat was associated with prolonged admission.

KEY WORDS

Accidents, Traffic, Epistaxis, Temporal bone, Tympanic membrane perforation.



INTRODUCTION

Road traffic accidents (RTA) are a significant contributor to death and disability globally.¹ Atreya and colleagues found an increasing trend in RTA in Nepal, with 25,788 vehicles collision in 2019/20.² Global burden of disease study estimated that road traffic injuries caused 73 million Disability adjusted life Years (DALYs) in 2019.³

Otolaryngological trauma is prevalent in RTA cases, with or without multiple organ injuries, since it is one of the most exposed part, vulnerable to trauma.⁴ Road traffic accident is an important cause of ENT (Ear, nose, throat) injuries in developing countries. Otolaryngological trauma incurs high costs of care due to prolonged admission, costly procedures and complications.

In developing countries, like Nepal, the morbidity and mortality of RTA associated ENT injuries remain neglected. ENT injuries are preventable and can be avoided as a cause of death and disability. The causes and mechanism of ENT injuries have been reported to vary with age and geographic distribution.⁵⁻⁷

This study aims at reporting the prevalent number and pattern of Otolaryngological/ ENT injuries in cases of road traffic accidents (RTA) and their outcome. The results thus obtained will help to provide base line information and necessary actions to be taken by health policy makers. It will also create an awareness among the health care workers in emergency department to perform a thorough otolaryngological examination and ENT consultation.

METHODOLOGY

This is a prospective, descriptive study of 90 patients attending the emergency department of Nobel Medical College, Biratnagar, Nepal secondary to road traffic accidents (RTA), who were diagnosed as cases of head and neck trauma and having ENT (Ear, Nose, Throat) injuries. This study was carried out over one year, from 15 October, 2020 to 14 October, 2021. Ethical clearance was obtained from Institutional review committee (381/2020). Informed consent was obtained from the participants/guardian before enrolling the participants in the study.

All the cases of RTA with ENT injury, presenting to emergency were included. The cases who did not provide consent for study were excluded. Convenient sampling method was applied.

After triage and resuscitation, a detailed history, as pertaining to age, gender, time of arrival to emergency, mode of injury/trauma, and presenting symptom was recorded in a proforma. After general physical examination, local otorhinolaryngological examination (Otoscopy, Rhinoscopy, Examination under microscope, Laryngoscopy) was done as per requirement on all the patients and recorded. X ray, Computed tomography (CT Scan), Magnetic resonance Imaging (MRI) was done, as needed. Other investigations as per requirement were done, like, routine biochemical and haematological examination. Cerebrospinal fluid (CSF) examination was done, as indicated.

Patients with minor injuries were treated and discharged to

be followed up in ENT OPD. Other cases were admitted and treated. Multi-disciplinary treatment was provided, as per the nature of injury.

Depending on the type of injury, the patients were treated either conservatively or by surgery. All patients were followed up till discharged or death.

Outcome variables were the complications, admitted or discharged, length of stay in the hospital, disability and mortality.

Statistical data analysis was done using SPSS software (Statistical Package for the Social Sciences, version 17.0, SPSS Inc, Chicago, Ill, USA). Data was summarized in form of proportions and frequency tables for categorical variables. Continuous variables were summarized using range. P-values were computed for categorical variables using Fisher's exact test. A p-value of less than or equals to 0.05 was considered to constitute a statistically significant difference.^{5,8}

RESULTS

Table 1: Age and Gender distribution (Range 4-80 years)

Age Range	Male	Female	Total
Upto 18 years	2 (2.22%)	2 (2.22%)	4 (4.44%)
>18-40 years	53 (58.88%)	13 (14.44%)	66 (73.33%)
>40-60 years	12 (13.33%)	4 (4.44%)	16 (17.77%)
>60 years and above	2 (2.22%)	2 (2.22%)	4 (4.44%)
Total	69 (76.66%)	21 (23.33%)	90 (100%)

As shown in Table 1, out of 90 patients examined, 69(76.66%) were male, and 21 (23.33%) were female patients. The age ranging from 4-80 years. The overall mean age was 32.33 years \pm 13.29, with mean male age 32.59 years \pm 12.46 and mean female age 31.48 years \pm 16.05. Most of the cases were in the age group of >18-40 years, 66(73.33%), followed by >40-60 years age group, 16(17.77%). Least were in the less than and up to 18 years age group, 4 (4.44%) and above 60 years, 4 (4.44%).

Table 2: Mode of Injury

Mode of accident	Male	Female	Total
Motorbike	38 (42.22%)	6 (6.66%)	44 (48.88%)
Motor vehicle	22 (24.44%)	9 (10%)	31 (34.44%)
Non motor vehicle/ Pedestrians	9 (10%)	6 (6.66%)	15 (16.66%)
Total	69 (76.66%)	21 (23.33%)	90 (100%)

As shown in Table 2, the commonest injury was that of motorbike accident, 44(48.88%), followed by motor vehicle in 31(34.44%) cases. Non-motor vehicle/cycle or pedestrians were 15 cases. Males were more common in each mode of injury.

The time of presentation to emergency ranged from 1-122 hours, with a mean time of 16.24 hours \pm 19.61.

Table 3: Mode of Injury vs Gender

	Motor vehicle accident	Non-motor vehicle accident/Pedestrian	Total
Male	60 (66.66%)	9 (10%)	69 (76.66%)
Female	15 (16.66%)	6 (6.66%)	21 (23.33%)
Total	75 (83.33%)	15(16.66%)	90 (100%)



As shown in Table 3, males were common in both motor vehicle (including motor cycle), 60(66.66%) and, non-motor vehicle (including cycle and pedestrian accident) group 9(10%), as compared to the number of female.

Out of a total of 90 cases, 68 (75.55%) patients had multiple injury, along with head and neck injury.

Table 4: Ear Injury (89 cases)

Presenting complaints	N (%)	Head injury/multiple injury No. (%)	Treatment principle	N (%)	Complications	N (%)
Hearing loss	20(22.47%)	15 (16.85%)	Conservative	20 (22.47%)		
Otalgia	17 (19.1%)		Conservative	17 (19.1%)		
Laceration	13 (14.6%)	10 (11.23%)	Surgical Repair	13 (14.6%)	Pinna Loss Perichondritis	2(2.24 %) 4 (4.49%)
Traumatic perforation of tympanic membrane (TM)	12 (13.48%)	10 (11.23%)	Conservative			
Tinnitus	8 (8.98%)	7 (7.86%)	Conservative	8 (8.98%)		
Bleeding ears	8 (8.98%)	5 (5.61%)	Conservative	8 (8.98%)		
Temporal bone fracture	7(7.86%)	6 (6.74%)	Conservative	7(7.86%)	SNHL Facial Palsy TM perforation	4 (4.49%) 2(2.24 %) 4(4.49%)
Vertigo	2(2.24%)	2(2.24%)				
Facial Palsy	1(1.12%)	0	Conservative	1(1.12%)		
CSF Otorrhoea	1(1.12%)	1(1.12%)	Conservative	1(1.12%)		

As shown in Table 4, A total of 89 cases had some kind of ear problem. Commonest presenting complaint was hearing loss in one or both ear, 20(22.47%), followed by otalgia, 17(19.1%), laceration 13(14.6%), traumatic perforation of tympanic membrane (TM), 12 (13.48%), tinnitus, 8(8.98%) and bleeding ears, 8(8.98%). Temporal bone fracture was found in 7(7.86%) cases. Vertigo, 2 (2.24 %), facial palsy, 1 (1.12%) and CSF Otorrhoea, 1 (1.12%) were other ear problems found. Multiple and or head injury was associated with in 56(62.92%) cases. Repair of laceration was done in 13(14.6%). Rest of the 76 (85.4%) cases were managed by conservative treatment plan. Ear complications were found in 16(17.97%) cases. Various complications were, like, pinna loss in 2(2.24 %), perichondritis, 4 (4.49%), sensorineural hearing loss, 4 (4.49%), facial palsy, 2(2.24 %) and tympanic membrane perforation in 4 (4.49%) cases.

Table 5: Nose Injury (55 cases)

Presenting complaints	N (%)	Head injury/multiple injury no (%)	Treatment principle	N (%)	Complications	N (%)
Epistaxis	20 (36.36%)	18 (32.72%)	Packing	20(36.36%)	Recurrent bleed	1(1.81%)
Nasal bone fracture	12 (21.81%)	11 (20%)	Reduction of fracture	12(21.81%)	Recurrent bleed Nasal deformity	3(5.45%) 2(3.63%)
CSF Rhinorrhoea	6 (10.9%)	6(10.9%)	Conservative	3(5.45%)		
Laceration	6(10.9%)	6(10.9%)	Surgical repair	3 (5.45%)		
Le Forte's Fracture	6(10.9%)	6(10.9%)	Wound debridement/repair	6(10.9%)		
Septal Injury/hematoma	5(9.09%)	5 (9.09%)	Surgical repair	6(10.9%)		
			Surgery/packing	5(9.09%)	Septal abscess	2 (3.63%)

As shown in Table 5, a total of 55 cases had different kinds of nose related problems. Multiple/head injury was associated with in 52(94.54%) cases. Commonest presentation was that of epistaxis, 20 (36.36%), followed by nasal bone fracture, 12 (21.81%), CSF rhinorrhoea, 6 (10.9%), laceration, 6 (10.9%), and Le forte's fracture in 6 (10.9%) cases. Septal injury/hematoma was found in 5 (9.09%) cases. Treatment was done by surgical repair in 52 cases, (94.5%). Conservative management was done in 3 cases, (5.45%). Complications were found in 8 (14.54%) cases. Recurrent bleeding nose in 4 cases (7.27%), nasal deformity in 2(3.63%) cases and septal abscess in 2 (3.63%) cases.

Table 6: Pattern of Neck/Throat/Oropharyngeal Injury (32 cases)

Presenting complaints	N (%)	Head injury/multiple injury N (%)	Treatment principle	N (%)	Complications	N (%)
Open wound /Laceration	11 (34.37%)	11 (34.37%)	Repair Tracheostomy	11(34.37%) 1 (3.12%)	Stenosis	1 (3.12%)
Abrasion, Hematoma, fracture of Laryngeal framework/dysphonia	21 (65.62%)	12 (37.5%)	Conservative repair Tracheostomy	18(56.25%) 3 (9.37%)	Hoarseness Stenosis	4 (12.5%) 1 (3.12%)

As shown in Table 6, a total of 32 cases had different types of neck/throat or oropharyngeal trauma. Multiple/head injury was associated with in 23(71.87%) cases. Open wound or laceration was found in 11 (34.37%) cases. Abrasion, hematoma, fracture of laryngeal framework and dysphonia was found in 21 (65.62%) cases. Surgical repair or intervention was done in 15(46.87%) cases and 4(12.5%) cases had undergone tracheostomy. Conservative management was done in 18(56.25%) cases. Various complications like stenosis, 2(6.25%) and hoarseness, 4(12.5%) were found.

Table 7: Mode of injury vs complications association

Complications	Motor vehicle/motorcycle	Non-motor vehicle/cycle / Pedestrian	Total	P-value
Ear complications				
Present	13 (14.44%)	3 (3.33%)	16 (17.77%)	0.694(>0.05)
Absent	62 (68.88%)	12 (13.33%)	74 (82.22%)	
Nose Complications				
Present	7 (7.77%)	1 (1.11%)	8 (8.88%)	0.122(>0.05)
Absent	68 (75.55%)	14 (15.55%)	82 (91.11%)	
Neck/Throat complications				
Present	6 (6.66%)	0	6 (6.66%)	0.844(>0.05)
Absent	69 (76.66%)	15 (16.66%)	84 (93.33%)	

As shown in Table 7, out of a total of 90 cases of ENT trauma, 16 (17.77%) cases of ear, 8 (8.88%) cases of nose and 6 (6.66%) cases of neck/throat /oropharynx had some kind of complications. Complications were found in 26(86.66%) cases of motor vehicle accident, and 4 (13.33%) in non-motor vehicle accident/Pedestrian, out of a total of 30 complications. However, p-value of mode of injury against the number of complications of ear, nose and neck/throat injury were not found significant (p-value for each category was >0.05). Discharge from the emergency was done in 9(10%) cases, while, 81 (90%) patients required admission and further treatment.

Table 8: Admission duration vs type of complications

Duration of admission	Complication		Total	P-value
	Absent	Present		
Ear injury				12.720(> 0.05)
Less than 2 weeks	58 (64.44%)	14 (15.55%)	72 (80%)	
More than 2 weeks	7 (7.77%)	2 (2.22%)	9 (10%)	
Nose injury				15.415 (>0.05)
Less than 2 weeks	42 (46.66%)	0	42 (46.66%)	
More than 2 weeks	4 (4.44%)	8 (8.88%)	12 (13.33%)	
Throat injury				21.817(>0.05)
Less than 2 weeks	17 (18.88%)	0	17 (18.88%)	
More than 2 weeks	9 (10%)	6 (6.66%)	15 (16.66%)	

As shown in Table 8, The duration of admission was divided in to less than 2 weeks and more than 2 weeks and individual complications of organ of trauma was compared. The presence of complication had no significant association to the duration of admission in ear trauma, nose or throat injury cases.

DISCUSSION

In our study, male, 69(76.66%) were more commonly affected with ENT trauma and injury, following road traffic accidents (RTA) compared to female, 21(23.33%), with an age range of 4-80 years. The mean age was 32.33 years \pm 13.29. Most of the cases were in the younger age group. A similar study by Singhai and co-authors also found male to be commoner.⁸ Those affected were of younger age group, with a mean age of 27.2 years. Similar results were reported by Madubueze and colleagues. The reason of male, and younger age group to be affected could be because that they are more active, outgoing for jobs and slightly carefree in attitude leading to a risky behaviour, making them prone to accidents.⁹

The mode of injury was divided into motor vehicle/motor cycle group and non-motor vehicle/cycle/pedestrian group. Motor vehicle/motor cycle injury was found in 75(83.33%) cases, in our study, which was the commoner one as compared to non-motor vehicle/cycle/pedestrian group. Male were commoner in each category.

Road traffic accidents are a common cause of ENT injury.¹⁰ ENT injuries secondary to RTA were more frequent in male in a similar study.⁸

The time of presentation to emergency ranged from 1-122 hours, with a mean time of 16.24 hours \pm 19.61, in our study. The mean time of arrival to emergency department was 18 hours in a study by Gilyoma and colleagues.⁵ Other studies also reported similar time of presentation to the emergency.⁷

Injuries to the ear, nose and throat can occur as an isolated injury or may be associated with multiple injuries. Out of a total of 90 cases, 68 (75.55%) patients had multiple injury, along with head and neck injury in our study. Multiple injury along with ENT injury is commonly reported in other studies as well.^{9,10}

Face, and ENT region injuries are commonly reported in various studies, because face and ENT region is the most exposed and unprotected part of body.^{11,12} The clinical presentation depends on the part of head and neck region involved. The commonest presenting complaints of ear trauma was hearing loss, 20(22.47%), along with, other various symptoms like otalgia, tinnitus, bleeding ears and vertigo. Other presentations were laceration, perforation of tympanic membrane, temporal bone fracture, facial palsy and CSF otorrhoea. Epistaxis, 20(36.36%) was the commonest presentation of nose injury, along with other symptoms and conditions like nasal bone fracture, CSF rhinorrhoea, laceration, Le Fort's fracture and septal hematoma. Similarly, abrasion, fracture of laryngeal framework, hematoma and dysphonia were common presentation in 21 (65.62%) cases. Laceration and open wounds of neck were also found in our study.

Similar pattern of injury of ear, nose and neck/throat was reported in a study, where ear injury was the commonest (59%).⁵ Ear injury was common in other studies as well.¹⁰ Pain (99%), bleeding from different regions (74%) are the

most common presenting symptoms in trauma patients. Laceration/ cut injury of various parts of ENT region and facial nerve palsy were reported in various other studies.^{13,14} Most of the ear injury was managed conservatively, while surgical intervention was required in 13 (14.6%) cases, in our studies. Most of the cases of nose injury were managed surgically, 52 (94.5%).¹⁵ Surgical repair was done in (46.87%) cases of neck injury, and, 4 (12.5%) cases underwent tracheostomy.

Almost, more than half of cases underwent surgical intervention in a similar study. Repair of lacerated wound was done in 52.5 % cases and Tracheostomy in 13% cases. Fracture treatment, nasal packing, drainage of hematoma were other treatment modalities used to manage the trauma cases.⁸ Similar treatment modalities were used by other authors, too.^{10,14}

Out of a 16 (17.97 %) cases of ear injury with complications in our study, pinna loss was seen in 2(2.24%) cases. Other complications found were perichondritis, sensorineural hearing loss, facial palsy and tympanic membrane perforations. Similarly, recurrent epistaxis was found in 4 (7.27%) cases of nose injury. Other nasal complications were nasal deformity and septal abscess. Among neck injury cases, hoarseness persisted in 4 (12.5%) cases while 2 (6.25%) cases had stenosis of airway. Most of the ENT complications were found in motor vehicle/motor cycle injury, though, it was not statistically significant (p-value >0.05).

Complications related to ENT injuries were found in 14.9% cases, in a study. Ear injury had the highest complications. Persistent epistaxis and hoarseness of voice were the commonest complications in the nose and throat respectively.⁵

ENT injuries are commonly associated with other body parts injury and these may complicate the management and affect the outcome. It may lead to significant morbidity and prolonged stay in hospital. Delayed presentation to tertiary care centre emergency may be attributed to various types of serious presentation and complication pattern in our study.¹⁵

Discharge from the emergency was done that of 9 (10%) patients, while, 81 (90%) patients required admission and further treatment, in our study. The presence of complication had no significant association to the duration of admission in ear, nose or neck/throat injury. There was no mortality in our series.

Patients who developed complications and those who had associated injuries stayed longer in the hospital (p < 0.001), according to a study. Prolonged hospitalization is associated with a burden on the resources and the productive time of population is lost.⁵

Social preventive measures, early transfer of injured patients to emergency, early intervention as to the management of ENT trauma can avoid complications. A good, prompt and primary wound repair, early management of tympanic membrane rupture, temporal



bone fracture, septal haematoma etc. can prevent facial disfigurement, ear discharge, hearing loss, facial nerve palsy, septal abscess respectively.⁵

The preventive measures of road traffic accidents can be done with better road conditions, modern safety systems of vehicle, avoiding drink and drive, safe speed limits and use of helmets.¹⁶

CONCLUSION

Otolaryngological trauma is common in road traffic accidents, and motor vehicle accidents are more common. Road traffic accidents are more common in male, and mostly it affects the younger age group. Ear was most commonly affected by injury and the complications were also common. Surgical repair was more common in nose injury.

LIMITATIONS OF THE STUDY

Since this was a single centred study with a limited number of participants, the conclusions may not be applicable to entire population. Only the cases where ENT consultation was sought for has been included, minor injury being discharged by emergency doctors.

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CONFLICT OF INTEREST

None

FINANCIAL DISCLOSURE

None

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