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Mortality Profile of Cervical Spinal Cord Injury in South India – A Cross Sectional Study

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ABSTRACT

Background: *Road traffic accidents are increasing as an alarming annual rate of 3 per cent in India experiencing an increasing trend in spinal injuries. The Cervical spine injury is becoming very common and causing many medico legal implications. To this purpose we have evaluated to identify different types of cervical spine injuries pattern and to correlate with mortality.*

Methods: *This study was conducted at Osmania General Hospital, Hyderabad for 12 months during the period of January 2004 to December 2004 and the data was collected from autopsy reports maintained in the department of Forensic Medicine, Osmania General Hospital.*

Results: *Spinal cord injuries were observed in 85 autopsy cases/ records in the study period. There were 74 (87%) males and 11 (13%) females of which 29 victims (34%) were between 30 and 39 years of age, followed by young adults between 20 and 29 yr (19.35%).The Manner of Cervical Spine Injury to the spinal cord with homicide-5 (6%); suicide-20 (23%); RTA-60 (70%).*

Conclusion: *In majority of accidental events fracture dislocation of cervical spine vertebrae C5 is involved followed by C4 and C6.*

Keywords: *Cervical spinal cord Injury, Road traffic Accidents, Suicide, Homicide*

INTRODUCTION

Road traffic accidents are increasing as an alarming annual rate of 3 per cent in India experiencing an increasing trend in spinal injuries.(1) Even though similarly distressing injuries, spine injuries are often reported as being rare and an uncommon cause of death among in road traffic accident victims.(2-3) The Cervical spine injury is becoming very common and causing many medicolegal implications. Evidence supports the fact that appropriate referral to trauma centers, equipped with proper facilities to

deal with serious injuries, results in reduction of mortality among spinal injury victims [4] we do not have National spinal cord injury (SCI) registry available in India to describe the mortality characteristics of the traumatic spinal cord injury (SCI). [5] To this purpose we have evaluated to identify different types of cervical spine injuries pattern and to correlate with mortality.

METHODS

This study was conducted at Osmania General Hospital, Hyderabad for 12 months during the period of January 2004 to December 2004. A Retrospective data was collected from autopsy reports maintained in the department of Forensic Medicine, Osmania General Hospital. The study protocol was approved by the Institutional ethics committee. All the autopsy reports with spinal injuries whether in isolation (Suicide and Homicide) or as a part of polytrauma were reviewed. In most of the cases anterior approach for spinal dissection was undertaken to prevent disfigurement to the bodies. The total number of cervical spine injury related deaths were noticed as 85. The demographic data, type of trauma, duration of survival, body areas involved, level of spinal injury and associated injuries were recorded. Level of injury was defined as cervical spine injury (CSI) when it included C1–C7

RESULTS

Spinal cord injuries were observed in 85 autopsy cases/ records in the study period. There were 74 (87%) males and 11 (13%) females of which 29 victims (34%) were between 30 and 39 years of age, followed by young adults between 20 and 29 yr (19.35%) (Table-1). The Manner of Cervical Spine Injury to the spinal cord with homicide-5 (6%); suicide-20 (23%); RTA-60 (70%) (Table-2). The Level of Cervical Vertebra/ Vertebrae involved in homicide Cases is C5 Followed by C4 and C6. (Table-3)

TABLE- 1-Age & Sex Wise Distribution Of Cervical Spine Injuries

Age	**0-9**	**10-19**	**20-29**	**30-39**	**40-49**	**50-59**	**60-69**	**70-79**	**Total**
Male	0	3	20	27	8	13	2	1	**74**
Female	1	1	5	2	0	2	0	0	**11**
Total	**1**	**4**	**25**	**29**	**8**	**15**	**2**	**1**	**85**

TABLE-2-Tabulation Based On Manner Of Cervical Spine Injury

Manners of Injury	**Female N=11**	**Male N=74**	**Total N=85**
Homicide	1	4	5
Suicide	2	18	20
RTA	8	52	60
Total	11	74	85

TABLE-3-Level Of Cervical Vertebra/ Vertebrae Involved In Homicide Cases								
	Occipital-Condyle	C_1	C_2	C_3	C_4	C_5	C_6	C_7
Subluxation						√	√	
Fracture dislocation					√	√		
Clean cut fracture						√	√	
						√		
Decapitation					√	√		

DISCUSSION

A few studies have been published from India on trauma (spinal injury) related mortality.[6-7] and none on mortality profile of patients with spinal injuries. Our study also reflected the age group of 30-39 years being the most susceptible for spinal injuries. In other studies the mean age of patients with SCI reported varied from 30.9 - 38.9 years [8-9] Road traffic accidents were the second commonest etiology in our study with 70.58% deaths. In a recent large series from India, road traffic accidents were found to be the leading cause of SCI closely followed by falls.[10]

In this study, people with cervical spine injuries belong to third and fourth decades of their lives, which constitutes active period of everyone's lives. Road traffic accidents are the major percentage due to urbanisation, industrialization and mechanisation with introduction of high speed vehicles, poor road conditions and not following safety road rules. In recent times laying of express highways, which tempts the drivers to go at high speeds with reckless and negligent manner resulting in accidents. Pedestrians also involved because not properly following the pavement rules, road crossing methods. Accidental rail injuries are reported rarely in previous years in Hyderabad. After introduction of MMTS-local trains, which run on pull-push high traction engines, which attains high speeds in a less time made these accidents to occur and these are increasing day by day. In homicide cases heavy cutting weapons like axe, hunting sickle were used. Assailants attach the victims choosing easily accessible parts of the body like neck, abdomen and chest of which neck is a very important portion which connects the head to the trunk. By causing grievous injury to the vital structures in the neck, assailant may easily get desired results. Suicidal cases observed in this study are all from rail run-overs. The twin city has three major railway stations with numerous local stations as spider web. These tracks are easily accessible to the victims of suicide. Even though in literature noted that high cervical spine injuries mostly in results fatalities, in this study, it showed that lower cervical spine injury like fracture dislocation of C7 resulted in death, indicating the poorly handling of the victim at the sport and during transit. The exact type of injury (whether contusions, concussion, laceration or transection) to the spinal cord is unable to present in this study since the spinal canal was not opened, which was due to reasons mentioned earlier.

CONCLUSION

Mortality due to cervical spine injury comprised 2.2%. Majority of victims were males with a male female ratio of 87:13. Common age group involved in their third and fourth decade of life. Accidental cases observed in 70% of cases. Suicidal cases are 24% Homicide are 6%. In homicides mid cervical region is commonly involved. In suicide cases upper cervical region is commonly involved. Lower cervical spine is commonly involved in (RTA). In majority of accidental events fracture dislocation of cervical spine vertebrae C5 is involved followed by C4 and C6.

CONFLICT OF INTEREST: NONE

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