

# Road Traffic Accidents and their Relationship with Neurological Injuries: A Comparative Study: Developed and Developing Countries

Karan J. Yagnik (MBBS)<sup>1\*</sup>, Aayushi Dave<sup>2</sup>

<sup>1</sup>Visiting Medical Student-Department of Surgery, University of Miami, Miami, FL, USA.

<sup>2</sup> Medical Student-GMERS, Sola, Ahmedabad, India.

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**\*Corresponding Author:** Karan J. Yagnik (MBBS), Visiting Medical Student-Department of Surgery, University of Miami, Miami, FL, USA.

## Abstract

**Background:** It road traffic accidents, 30% to 70% death cases are related to neurological injuries. Protection of head, neck and back is important. The neurologist and neurosurgeon are concerned with RTA. All major types of neurological injuries have been discussed and compared.

**Material and Method:** Statistical data has been taken from government official website. The data provided by many insurance companies are important. Research papers and articles on pub med, Scopus and Google scholar have taken in to account.

**Result:** It was found that traumatic brain injuries due to road traffic accidents is more frequent and then spinal cord injuries. Author PNS related injuries are also reported higher rate of death in developing countries unavailability of medical facilities. RTA is more frequent in male between the ages of 18 to 35.

**Conclusion:** Death of person due to Road traffic accident is most probable due to neurological injuries. It is preventable in most neurological and neurosurgical facilities. It can be also decrease by protecting CNS by equipment. Death rate is much higher in developing country like India and Iran.

**Keywords:** Road Traffic Accidents, Spinal Cord Trauma, Acute Care Surgery and Trauma, Hematoma, Neurological Injuries.

## Introduction

In developing countries like India, there was 1317 accidents /day means 55 Accidents/hr on average, and 413 people killed/day means 17 persons/hr on average as a report from the government of India. Road Transport and highways transport, research wing reports, most of the total the injuries are neurological and preventable [1].

The world health Organization predicts that RTA will be increased up to 2.6% and will become the seventh leading cause of deaths2.

The majority of the patients RTA (61%) are of age group 15 to 35. One of the reasons is more populous and more users of vehicles. In developing countries, two-wheelers are also an effective portion of RTA [2].

During RTA person has no control over his/her movements his/her head may come into contact with immobile hard surfaces or free-flying objects. The type and seriousness of the injury depend on the point of contact. Whiplash shock could occur to the Neck or back because of a sudden change in momentum.

In the First half of 2020, at height of the Covid-19 Public health emergency total traffic volume decreased and hence the total number of accidents also decreased.

## Review and Discussion

All India Medical science, New Delhi and reports of research wing, ministry of road transport and highway, Government of India Show 17.48% had head injuries of which 39.94% died on the spot while 28.51% has died within 24 hours.

The highest number of injuries and fatalities is borne disproportionately by poor people. Many of them are pedestrians, cyclists, and minibuses including sharing passenger vehicles [3].

### Head Injuries:

Mild, moderate to severe traumatic brain injury due to RTA can result in temporary or permanent changes in a person's life States of consciousness are 1. Coma 2. Vegetative state 3. Brain death 4. Loss of conscious state partly (loss of memory). First aid and advice are in **Table -1**. Classification and probable types of injuries are as shown in **Chart-1**. A comparative number of RTA and mortality is as shown in **Graph-1** for developing and developed countries. First transportation and hospitalization RTA victim person should be as per international standard. The difference between developed and developing countries at the advancement of technology. The most important change in the past few years' introduction of frameless stereotaxic which is available at very few centers in developing countries.

	DO	Do not
1.	Check the person's airway breathing and circulation	Do not be siege patient by crowd
2.	If necessary start rescue breathing	Do not put any pressure to head or spinal cord or neck
3.	If person's breathings is normal unconscious most probable there is spinal injuries keep the head in line with spine	Do not destabilize head or neck. One can put both the hands on sides of head to stabilize.
4.	In the case of bleeding, stop it by firmly pressing clean cloth.	Do not use any cloth or cotton. If you feel skull fracture do not apply direct pressure.
5.	If person is vomiting, prevent choking	Do not move as a part of the body
6.	Apply ice to swollen area.	Ice could be cover with cloth. It should not directly touch the skin or do not wash head.
7.	If serious head injury, open helmet window	Do not remove helmet.
8.	If person seem dozed ,do not allow him to move	Do not shake person

**Table 1:** Neurological Injuries and First Aid.

### Spinal Injuries:

The Chance of Sustaining serious spine and its related multiple injuries in road traffic accidents are second-highest after head injuries. This is due to inappropriate traffic conditions including low-level standard of car, poor road condition, low quality of equipment, and quality of driving. But once an accident occurs, it is a question of medical science to serve properly and timely. Comparison of developed and developing countries about mortalities rate is a shown in **Graph-2**. The mortality rate of developing countries is very high compare to developed countries. Suggestions and important points are **Annexure-1**. For first aid treatment to a person is suggested in **Table-1**

For family Physicians types of injuries and diagnosis options are in **Chart-2** car rollover was the most common mechanism of spinal fracture and collision is the second most mechanism [8]. A spinal cord injury can cause loss of movement, sensation, and control of bodily function such as hand and leg movement, breathing, or lower movement we can understand, how costly it is?

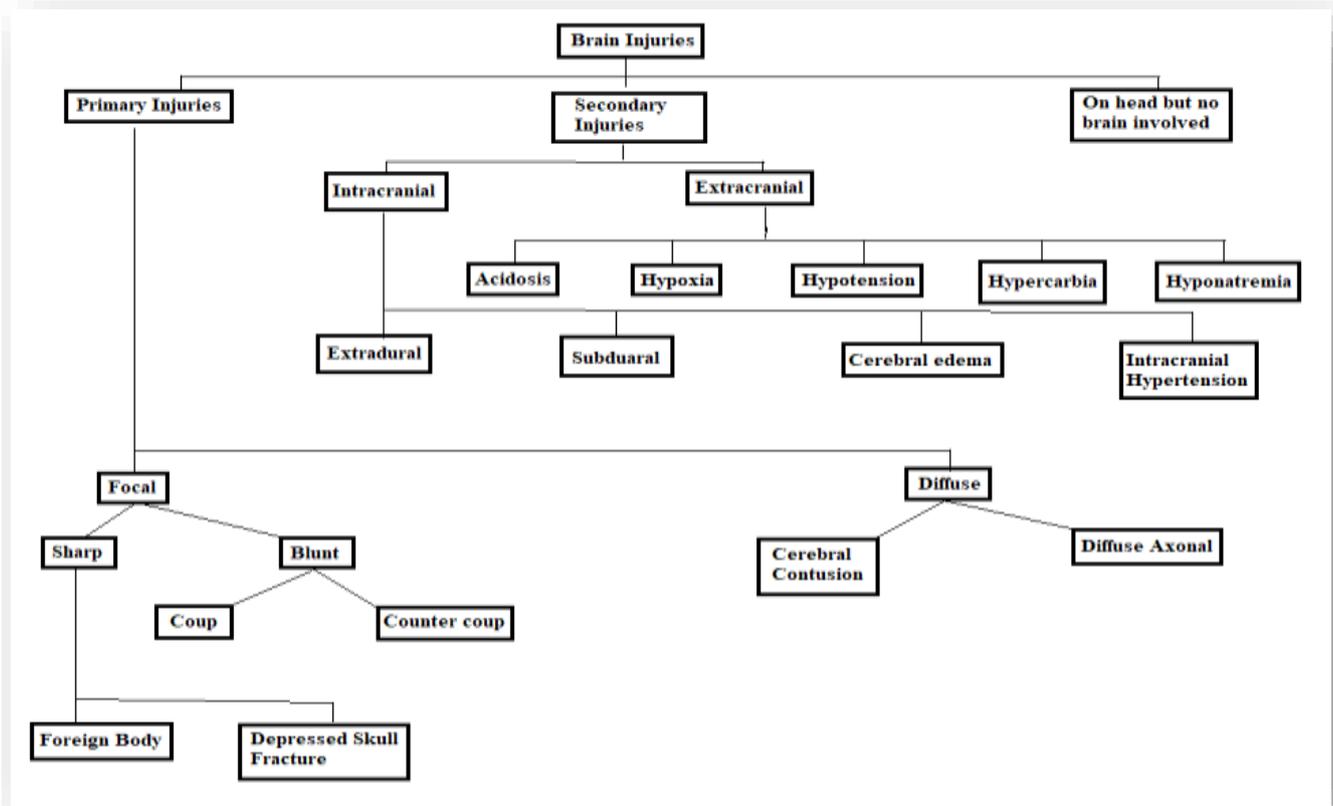


Chart 1

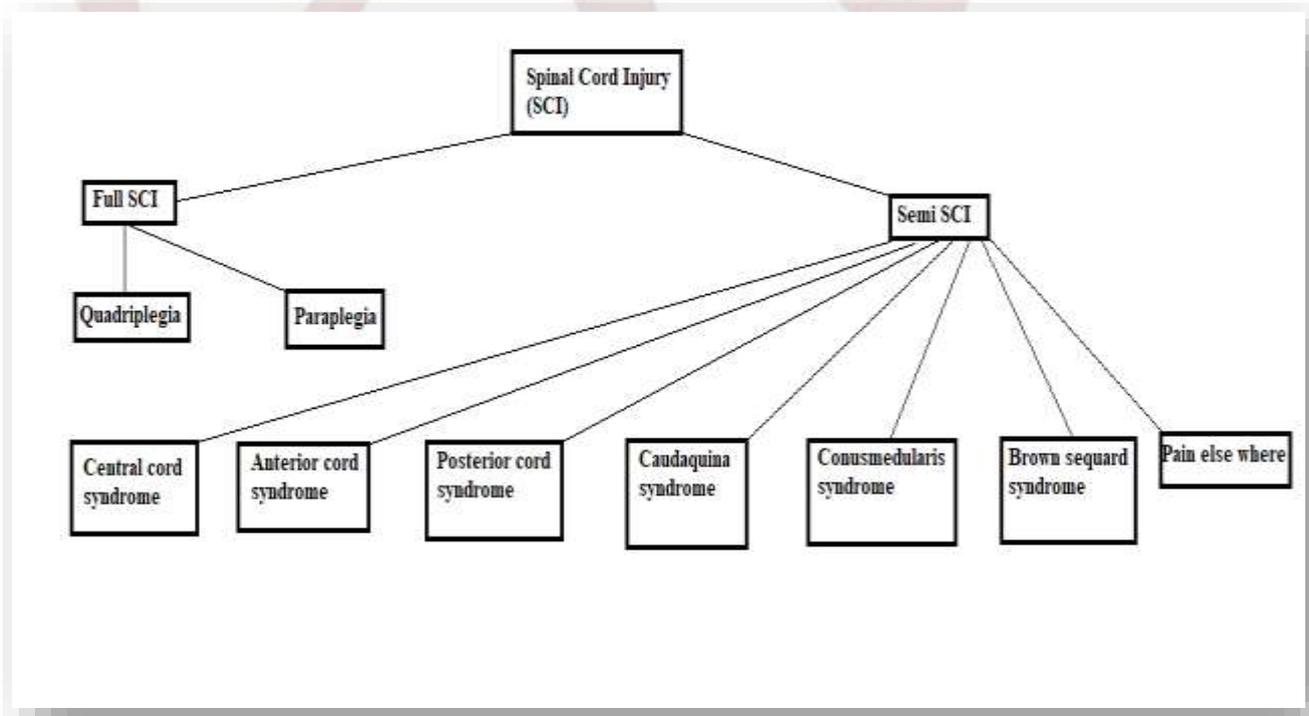
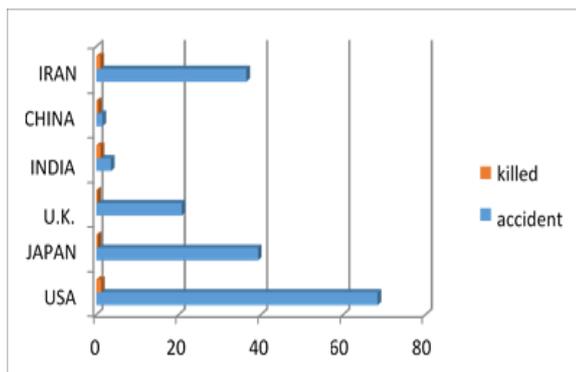
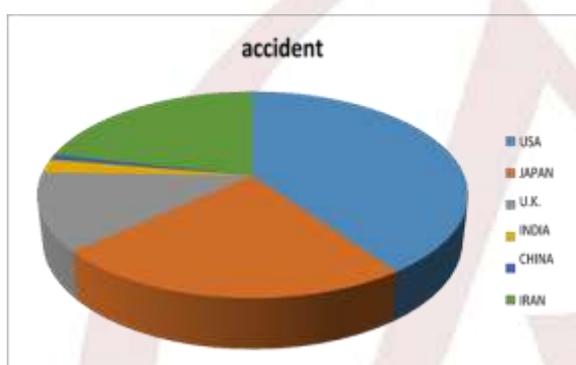


Chart 2



Graph 1



Graph 2

### Peripheral Nerves Injuries:

Peripheral nerves injury depends on which nerves fibers are affected and symptoms depend on it.

1. Sensory nerves: we feel touch, temperature, and pain through it. Injuries to these may experience numbness or tingling.

Though it is not deadly trouble life

2. Motor nerves: These nerves regulate all the conscious control muscles. Damage to these nerves typically causes painful cramps and muscle weakness, which may result in uncontrolled muscle movement

3. Autonomic nerves: Non-controlled conscious activities are regulated by these groups of nerves. Heart movement, breathing, and thyroid function, etc. are regulated by these nerves. [4-7].

### Annexure-1:

#### Suggestions and Important Points:

1. A national-wide computerized trauma registry required to access and to analyse problem [5].
2. Availability of good neurological care at the site can save lives

3. Good quality of vehicles with all safety measures must be to save lives.
4. Corrupt traffic management system cannot apply strict rules of traffic.
5. Roads and other facilities are just off level in developing countries must be appropriate.
6. Education and awareness about traffic rules and safety measurements have to be needed especially in rural areas.
7. Though one may be in shock immediately following an accident call medical help center either by the victim or by the helper on the road is required
8. Research studies emphasize the severe need to improve prehospitalization care. With the provision of trauma services at accident site<sup>4</sup>.
9. A person who was in the major vehicle for 30 miles every day for a year faced fatality risk about in 12500 which is whisper by 112 times include the public transportation mode in the USA.
10. India accounts for about 10% of RTA fatalities world wide<sup>5</sup>.
11. A study conducted in Iran shows pre-hospital mortality was found 39.84 % and the rest 64.16 % were taken to the hospital<sup>6</sup>.
12. Appreciate good standard of car manufacturing with all safety measures in cars could save lives.
13. RTA was caused by someone's negligence, careless or recklessness.
14. Spinal cord injuries due to RTA has a higher survival rate all over the world but lower neurological recovery than the general SCI, even in developed countries.
15. On-site, treatment of patients with SCI focuses on, preventing further damage. If the spine is unstable take care of the transformation of the patient. Resuscitation: Sufficient Oxygen saturation of peripheral blood. Taking care of restoring blood pressure to acceptable limits.

### Important Instruction for layman who is helping on accident site.

1. Call ambulance immediately and park your vehicle appropriately.
2. Instead of arguing for responsibility of accident, start helping victim.
3. A serious head or spine injuries must be treated in a hospital before that follow the instructions. If any medical professional allows him to take charge and help him /her.

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