

Original research article

Vascular injuries pattern following road traffic accidents - A prospective study

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ABSTRACT:

BACKGROUND: Vascular trauma is an emergency. Lack of timely intervention can lead to loss of limb or even life. In spite of the rising incidence of high speed road traffic accidents in India, there is paucity of literature regarding the demographic pattern, clinical morbidity, management strategies and outcome of arterial injuries associated with trauma.

AIM; The aim of this study is to describe the epidemiology and outcome of trauma with associated vascular injuries in various tertiary care medical colleges in Tamil nadu India

MATERIALS AND METHODS: All the patients attending and admitted with injuries in the casualty, trauma wards of various government medical college hospitals in Tamil nadu, India, between jan2017-nov 2018 are taken for study .

.RESULTS: Out of 41,468 patients admitted in the trauma ward , 421(1%) patients had vascular injuries , males 361,(86 %) female 60 (14%) the most common anatomical site is lower limb 276 (66%), Upper limb vascular injuries were 112(27%) followed by thoracic and other injuries 33(8%) All thoracic aortic injuries were acceleration injuries (pedestrians hit by a moving vehicle The hospital stay, and ICU stay were significantly higher in the vascular injury group compared with nonvascular group .

CONCLUSION: Motor vehicle accidents (RTA) are the leading cause of vascular injuries in India. Road safety measures and prevention programs are the need of the hour to prevent these kinds of injuries in the future .Timely referral will save the limbs and life.

KEYWORDS: vascular injuries, trauma, road traffic accidents

Introduction:

Road traffic Accident rate in Tamil nadu ,State is highest in Indian sub continent. Further more ,road traffic Accidents (RTA) account for more than 30 % of deaths . The behaviour of drivers and compliance with safety measures in India are completely different from those in developed countries . In a recent report; only 25% of drivers used to wear seatbelts regularly.

The severity of head injury was the most significant factor affecting morbidity and mortality in two wheeler riders involved with RTA in our community indicating low compliance with use of helmets, after the government order for compulsory helmet a lot of head injury were prevented. bleeding due to vascular injuries, delay in referral, Hypotension on arrival was another significant factor affecting RTA mortality

.Vascular injuries can be life-threatening and their prompt diagnosis is essential for favourite outcome. The incidence, detailed mechanism, and nature of vascular injuries following road traffic collisions including their anatomical distribution are not well studied in our country. We aimed to prospectively study the incidence, detailed mechanism and anatomical distribution of hospitalized vascular trauma patients following road traffic accident

Materials and methods:

Data collected prospectively from April 2017 to nov 2018.patients who were admitted in casualty and trauma wards of various government medical colleges in , Tamil nadu, India were taken for study.

Demographic data collected including the patient's age, gender and other personal details. In addition it included the type of vehicle (s) involved vascular injuries, other injuries, the procedures required and the final outcome.

Results:

| <i>Characteristics</i> | <i>Category</i> | <i>Frequency</i> |
|---|-------------------------|--------------------------|
| <i>Age (years)</i> | <i>Below 20</i> | <i>62</i> |
| | <i>21--40</i> | <i>149</i> |
| | <i>41-59</i> | <i>191</i> |
| | <i>≥ 60</i> | <i>19</i> |
| <i>Gender</i> | <i>Male</i> | <i>359</i> |
| | <i>Female</i> | <i>61</i> |
| <i>Body Mass Index (kg/m²)</i> | <i>19-25</i> | <i>226</i> |
| | <i>>25</i> | <i>195</i> |
| <i>Injuries due to</i> | <i>Two wheeler</i> | <i>215</i> |
| | <i>Four wheeler</i> | <i>77</i> |
| | <i>Bus/lorry train</i> | <i>129</i> |
| <i>Limb involved</i> | <i>Upper</i> | <i>112</i> |
| | <i>Lower</i> | <i>276</i> |
| | <i>Others</i> | <i>33</i> |
| <i>Common vessels involved</i> | <i>brachial</i> | <i>98</i> |
| | <i>Popliteal others</i> | <i>212</i> <i>111</i> |
| OTHERS 33 | | |
| Thoracic aorta 3 | | |

| <i>Characteristics</i> | <i>Category</i> | <i>Frequency</i> |
|---|-----------------|------------------|
| <i>Other associated Health Problems</i> | <i>DM</i> | 66 |
| | <i>SHT</i> | 74 |
| | <i>BOTH</i> | 28 |
| <i>complications</i> | 23 | |

Total number of patients admitted in trauma ward 41,468

patients, with vascular injury 421(1%)

Males 361, (86%)

Female 60 (14%)

Upper limb vascular 112 (27%)

Lower limb Vascular 276 (66%)

Thoracic aorta and other abdominal 33 (8%) Thoracic aorta 3

Pelvic vessels 6

Renal artery 4

Femoral artery 6

Portal vein 6

Hepatic veins 2

Anterior tibial artery 6

ICU stay were significantly higher in the vascular injury group compared with nonvascular group

All our vascular injured patients had associated fractures except few (21)patients

Discussion

The incidence of vascular injury has increased worldwide during the last few years with variation in mechanism and pattern in different populations. The commonest mechanism of injury in civilian practice is road traffic collisions while the increase in penetrating vascular trauma is directly related to penetrating firearms and stabbing accounted for about 40% of all vascular traumas in Ireland and Australia. A population based study from Scotland reported an incidence of aortic injuries of 0.3%. Blunt trauma caused 73% of these injuries of which RTC was the most common cause. The majority of vascular trauma in USA, South America and military conflict areas in Europe was penetrating trauma reaching up to 90% in some reports. The actual incidence of vascular trauma in most European countries is unknown. Finland has an annual incidence of 1.3 per 100,000 inhabitants while Sweden has an incidence of 2.3 per 100,000 inhabitants. Our incidence of major vascular trauma due to road traffic collisions alone is 1%.

The studies from Sweden and Finland included all vascular injury patients admitted to hospitals. About 20% were caused by blunt trauma. In contrast our study was limited only to hospitalized vascular injury in road traffic collisions. Analyzing the biomechanics of crashes is important. About 90% of injuries can be clinically predicted if the biomechanics of RTA was well understood. This will help reducing missed injuries. It is

important to note that the majority of vascular injuries were in the upper part of the body (upper limb and thorax) similar to other studies.

All thoracic aortic injuries in our study occurred in pedestrians hit by moving vehicles. These are acceleration injuries in which the moving aortic arch is accelerated compared to the fixed part. We have recently shown that injury severity of RTA patients was higher for . The risk of thoracic aortic injury was significantly higher with side-impact crashes and particularly if the occupants were unbelted because side impact hits the weak side of the vehicle.

None of our car occupants was wearing seatbelts. If an occupant was not restrained and had a front impact collision, he/she will lean forward and may try to protect him/herself with his/her upper limbs leading to their fracture and major vascular injuries of the upper limbs as they cannot tolerate the impact of energy. Defining the incidence and mechanism of vascular trauma would help in adopting preventive strategies and directing resources. Trauma centers should be well equipped with an angiographic suite, interventional radiologists, and a vascular team to optimize clinical outcome of these life-threatening situations.

The most affordable, effective and cheapest way to reduce the burden of injury is prevention. Injury prevention is usually highly cost effective saving both medical costs and lives. We should adopt an epidemiological approach if we are serious in preventing these injuries. This includes providing a practical structure for surveillance, analysis, and prevention of injury. Furthermore, enforcement of the law of helmet seatbelt usage, strict penalties for high speed, and a public educational program are highly needed in our country.

In summary, the incidence of hospitalized vascular injury due to road traffic collisions in our study is 1%

These injuries occurred mainly in the lower limbs. Seatbelt compliance of car occupants having vascular injuries was very low. Compliance with safety measures needs more enforcement in our community.

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