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Review Article

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An Overview on Road Traffic Accident Management Approach

Maitham Nasser M Alrasasi[1], Houreya Mohammad Alismail[2], Fatimah Abdullatif A Alabbad[3], Hashem Mohammed S Justaniah[4], Nouf Abdullah S Alanazi[5], Ahmad Abdulsamad Ahmad Alhamoud[6], Abdulrahim Ahmad Almasabi[7], Nayil Radi O Alanazi[8], Albaraa Taher Rajeh[9]*, Sakinah Abbas Alrashed[10]

[1]Department of Surgery, Jafer General Hospital, Ahsa, KSA.
[2]Department of Emergency Medicine, QCH, Dammam, KSA.
[3]Department of Emergency Medicine, King Fahad Hospital Al-Hassa, KSA.
[4]Department Emergency Medicine, Alnoor Specialist Hospital, Makkah, KSA.
[5]Faculty of Medicine, Northern Border University, Arar, KSA.
[6]MBBS, King Saud bin Abdulaziz University for Health Sciences, Riyadh, KSA.
[7]Faculty of Medicine, Umm Al Qura University, Makkah, KSA.
[8]Faculty of Medicine, Medical University of Warsaw, Warsaw., Poland.
[9]Faculty of Medicine, Ibn Sina National College of Medicine, Jeddah, KSA.
[10]Department of General Surgery, King Fahad Specilist Hospital, Tabuk, Saudi Arabia.

***Email:** albaraarajeh@gmail.com*

ABSTRACT

Road traffic accidents are extremely common in low- and middle-income countries. Speculations show a correlation between male gender and traumatic injury, due to more rates of risky behaviors such as speeding and not adhering to safety guidelines. In this review, we aimed to evaluate the different types of injuries associated with Road Traffic Accident, and highlight the general management approach. We searched the literature on Mesh terms: (traffic accident), (injury), (fractures). Only articles relevant to traffic associated injury were included. RTA related injuries are important emergency conditions that necessitate traumatic survey and surgical intervention in many cases. Adhering to road rules and safety guidelines may help in reducing the number of fatalities and disabilities resulting from an otherwise preventable cause.

Key words: *Road traffic accident, Management approach, Evaluation, Injuries*

INTRODUCTION

Road traffic accidents are the cause of many deaths worldwide, despite global efforts on vehicular safety and regulations. These accidents cost human lives and affect health resources and economies on a large scale [1-4]. This is because people affected by the injury could suffer severe disabilities rendering them unable to return to work or daily living. Less fortunate people may die from their injuries. While excessive speed is the commonest reason for vehicular accidents, it is important to consider other factors in these accidents. For instance, vulnerable groups include drivers of motorcycles and pedestrians.

Most traffic-related mortality occurs in non-high-income countries, this is multifactorial and could be due to lax traffic rules. In high-income countries, like South Korea, most traffic accidents occur due to violations of road safety by citizens aged 41-60 years [5]. The age group differs by region, in India, the predominant age group was young adults [6]. The age may vary across countries, but nearby regions such as Bangladesh had similar age mean in its traffic victims.

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There is also a high propensity that the victims are more likely to be made by a large margin. In India for example, the male to female ratio was 407:93 [6]. This predominance of male gender in traffic accidents is common in nearby countries such as Bangladesh [7]. This male affinity to trauma is also present with non-motor vehicles such as bicycle accidents [8]. Regardless of the vehicle type, traumatic injury after traffic accidents can affect any part of the body. Vulnerable areas are occasionally also fatal, these include the head, chest, abdominal pelvis, and spine.

RESULTS AND DISCUSSION

There is a clear male predominance across multiple countries when it comes to road traffic-related injuries. Pelvic fractures are common and are most commonly associated with urethral trauma, variably necessitating suprapubic catheterization. In cyclists, it is commonly the head and neck that are at risk of injury. Mortality is greatly reduced in the latter group when they wear proper head protection.

Head injury

There are, however, other modalities for transport which include motorcycles and bicycles. Both of the latter offers less protection for the head and neck than cars or trucks. Moreover, certain injuries may relate to the vehicle type, for instance, bicycle-related accidents are more likely to cause facial bone fractures and neck injuries. In cyclists who are injured, the head and neck are the most commonly injured, followed by chest related injury [8]. Maxillofacial and dental injuries are likely in such scenarios, with mandibular fractures being the most common [9].

Furthermore, studies in cyclists show that the most common injuries are in the head and neck. Reports have shown clinical benefit to wearing proper protective equipment, namely helmets. This is because headgear resulted in a reduction of serious head injury by nearly two-thirds, and mortality by a third compared to those who have not used helmets [10].

Spinal injury

Injury to the back is common in traffic accidents, this is because while the back is sturdy and protected by the vertebrae and shoulder blades, the soft tissue and musculature are the vulnerable areas. Spinal trauma is notoriously prevalent with vehicular accidents. In Saudi Arabia, these motor accidents were responsible for fourth-fifths of spinal traumas [11]. In addition to spinal trauma, the soft-tissue injury could manifest as herniated vertebral discs or variable nerve injury. This could often be missed in a patient without neck protection or inclusion of back examination in the trauma survey and examination.

RTA accidents could result in severe detrimental injury, ranging from motor to psychological disturbance. Spinal trauma in particular could result in sensory or motor or combined paralysis. This, depending on the site of injury, manifests as quadriplegia or paraplegia. For instance, in one form of post-traumatic injury to the cervical spine, the patient may fall into quadriplegia and shock. This latter presentation results from complete cord transaction, after hyperflexion or hyperextension of the neck during the impact [12].

Pelvic fractures

The most commonly associated injuries in a traffic accident would relate to bone fractures. Pelvic fractures, in particular, are more prevalent in male victims [7]. This is evident with the high number of lateral pelvic compression fractures. Other traumatic injuries may involve the sacrum, a critical joint between the spine and pelvis, which could result in a spinopelvic dissociation [13]. Fortunately, evidence shows the remarkable benefit of modified triangular fixation combined with internal fixations in these patients with post-traumatic dissociation [13].

Urethral injury

Also, urethral injury is at the highest risk of occurring in these traumatic events to the pelvis [7]. Some clinical signs may offer guidance in patients with pelvic fractures, such as suprapubic tenderness, blood at the urethral meatus, or a high-riding prostate. In patients presenting with any of the former signs, a urethral injury must be suspected and attempts to insert a urethral catheter are discouraged. Instead, a suprapubic catheter would be a better alternative to relieve the patient. A certain investigation of retrograde urethrogram is often reserved for these patients with post-traumatic urethral damage [14]. Genitourinary injuries are common in both the driver and

passenger of a motorcycle. Data have shown that renal injury was the most common genitourinary injury, followed by urethral injury as well as testicular injury [15].

Organ injury

Both blunt and penetrating abdominal trauma may occur with traffic accidents. In people wearing seatbelts, the risk of blunt abdominal injury is increased to organs not protected by the ribcage. Blunt abdominal injuries should be highly suspected during traumatic surveys as they can be missed.

Liver lacerations are common, especially in young patients involved in traffic accidents, many of these injuries are now managed conservatively, but some cases may necessitate surgical intervention and liver packing [16].

Internal injuries include organ trauma but include previously mentioned spinal injuries, closed fractures, and also vascular pathology such as venous thromboembolism. In patients with hypovolemic shock due to blunt abdominal trauma, a transcatheter arterial embolization approach may result in a favorable outcome [17].

Venous thromboembolism

Deep vein thrombosis is always a risk in drivers, especially long-distance drivers. The condition also occurs in post-traumatic and post-surgical patients. This is because in both the former and latter conditions, the blood flow is disrupted and coagulative factors activated. The problem with deep vein thrombosis could increment to a fatal condition, pulmonary embolism. Pulmonary embolism is an important aftereffect of traumatic injury, especially in traffic-related trauma [18]. This emergency condition is variable in presentation, patients would commonly present with tachycardia and pleuritic chest pain, however, this is not always the case. The presentation may not be classical or former signs may be missed in the event of co-morbid conditions.

Vascular injury

Traumatic injury to the vasculature occurs with deceleration injuries. Studies have shown that traffic-related trauma is the most common cause of carotid arterial dissection injury [19]. Patients at risk include those in their fifth and sixth decades of age [19]. Severe bleeding at the time of the accident should be controlled first by adequate pressure and fastidious fluid replacement. In the hospital, blood transfusion should be initiated and a thorough investigation to locate the site of bleeding as well as any occult bleeding should be prioritized.

This is important in patients who are hemodynamically unstable and are actively bleeding, as this necessitates urgent surgical intervention. Imaging modalities such as diagnostic peritoneal lavage and focused abdominal assessment ultrasonography are still used but have been largely superseded by CT in hemodynamically stable individuals. An important cause of hemodynamic instability is inferior vena cava injury and subsequent bleeding. Most inferior vena cava injuries are commonly associated with blunt liver injuries [20]. However, they may also occur in penetrating abdominal injuries.

CONCLUSION

RTA related injuries are as common as traffic accidents themselves. These injuries of modern era vehicles can often be fatal, and on occasion are detrimental to daily functioning. The surgeon should be aware of the injuries lying underneath a normal-appearing abdomen. These internal injuries could range from blunt organ to spinal and back penetrative injuries.

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