

DISCUSSION

Traumatic injuries are the most common cause of death among young people, a leading cause of disability and years of life lost. Trauma patients constitute an important subgroup that comes to our emergency department. Trauma to the spine and spinal cord is a potentially devastating injury. Spine and spinal related injuries, which are common after traumatic injuries, have a low functional outcome. ⁽¹⁾

Diagnosis of cervical spine injury (CSI) can be difficult in patients with multiples injuries and /or an altered level of consciousness .this difficulty can lead to a delayed or missed diagnosis of CSI. ^(1,2) One study revealed that the rate of over looked CSI among traumatic brain injury (TBI) cases with a Glasgow coma scale (GSC) score of 8 or lower was 10.5% in1991 and 2.3% during the years 1994-2003.⁽³⁾ due to altered level of consciousness these patients were often unable to report their neck pain .In addition, a thorough neurological examination was difficult because CSI was often associated with other acute polytrauma with life-threatening conditions ,pharmacological influences, paralysis ,and alcohol.^(1,4)

A key recommendation of advanced trauma life support protocols (ATLS) is routine cervical spine immobilization. This recommendation was developed because it was believed that immobilizing the spine would be the best way to prevent injury to the spinal cord following a traumatic injury, ⁽⁷¹⁾ and that therefore it was in the best interests of all patients whose injuries had not yet been assessed. Cervical spinal injury is, however, relatively rare in trauma patients, occurring in around 2% of admissions. ⁽⁷²⁾

The main stay of initial radiographic evaluation of the spine after acute trauma remains plain radiographs. CT scanning remains the best mode of delineating the bony details of a spinal injury and should be used to characterize all bony injuries identified on plain radiographs. As CT technology continues to improve, it is likely to play an even greater role as an initial screening tool. The role for MRI continues to expand, particularly in detecting the soft tissue components of injuries. ⁽⁷⁵⁾

In patients in whom radiographic evaluation of the spine is indicated by injury mechanism or other reason, imaging of the cervical spine takes first priority. A lateral cervical radiograph is usually obtained as part of the trauma series (which also includes an antero-posterior chest and pelvis film). Plain radiographic assessment of the cervical spine is considered a component of the secondary general trauma survey, which is performed once the patient's airway and hemodynamic status have been stabilized. Achieving adequate image resolution and completeness is vital, because the most commonly cited reason for missed injury is inadequate radiographs. ⁽⁷⁶⁻⁷⁹⁾

The present study was prospectively conducted on (161) one hundred and sixty-one patients subjected severe trauma and presenting to the Emergency Department at Alexandria University Hospital within 24 hrs after trauma within a period of 6 months from March 2014 to August 2014.

The aim of this study was to determine the incidence & mechanism of vertebral fractures in trauma patients and any associated injuries.

As regarding gender, 7 patients were males (70%) and 3 patients were females (30%). The overall male to female ratio was 3:1.

This is in agreement with Simon J. Roche et al.⁽⁸²⁾ study, where 61.4% were males and 38.6% were females. The overall male to female ratio was 1.58:1

Also there is agreement with Shahrokh Yousefzadeh Chabok⁽⁸³⁾ study which was carried out at Poursina Hospital, main trauma center of Gilan between August 2005 and November 2006 that included 71.8% male and 28.2% female. Male/Female ratio was 2.55:1.

Also this is in agreement with Heidari Pedram⁽⁸⁴⁾ study in which 68.5% of patients were males and 31.5% of patients were females. Male to female ratio was 2.5: 1

This male predominance is probably due to higher physical activity by men and also because men are more involved in outdoor activities and traffic accidents and also they are more prone to violence and assault. This may also be attributed to the fact that the females, most often, are confined to house work, involved in fewer social activities than men, are unlikely to work in occupations that are in high risk for accidental falls like building construction and they drive vehicles less frequently and more carefully than males.

As regarding age, this study conducted on patients with range from 18-77 years and mean age of 36, 43.8 years, adult group in the fourth & fifth decades of life (41-60yr.) was the most age group affected (40%) and this finding is in agreement with Shahrokh Yousefzadeh Chabok⁽⁸³⁾ study which was carried out at Poursina Hospital, main trauma center of Gilan between August 2005 and November 2006 in which Over all 51% of people with spinal injury were between 20 and 44 year-olds.

This also agrees with Heidari Pedram⁽⁸⁴⁾ study which was carried out on 619 patients that had traumatic spinal fractures with mean age of patients with spinal fractures was 38.4 years ± 16.8 years (range 3-80 years). The highest rate of spinal fractures was observed between 41- 60 years (46.7%)

The possible explanation for the higher frequency of traumatic spinal fractures in this age group is that the fourth and fifth decades of human life are active decades in life and thus people in these decades are vulnerable to trauma. These age groups also show more activity in sports, fights, violent activities, industry and high speed transportation. In developing countries the old aged people are economically dependent on the young for their livelihood. The low frequencies of very young and old age groups are due to the low activities of these age groups.

As regarding cause of trauma, this study showed that the most common cause of cervical spinal fractures was road traffic accident (RTA). Seven patients representing 70% of cases were caused by this mechanism, followed by falls with 2 patients representing 20% of cases. One patient representing 10% of cases sustained a spine

There is agreement with Langston T et al.⁽⁵⁾ study, which demonstrates that the most common mechanism of injury was RTA followed by falls and assault.

In contrast, Heidari Pedram⁽⁸⁴⁾ study which was carried out on 619 patients that had traumatic spinal fractures. Falls was the most common cause of spinal fractures (47.17%). RTAs were the second common cause of spinal fractures (44.1%).

There is some agreement with Shahrokh Yousefzadeh Chabok⁽⁸³⁾ study; the most common causes of spinal injuries were motor vehicle accidents (52%) and fall (43%). The remainder was caused by falling heavy object on spine (2.4%) and other mechanism (2.4%).

In our study, 70% of patients were victims of RTA while 20% of patients were victims of falls. 71.4 % of patients due to RTA are less than 60 years and 28.6% are over 60 years. While 50% of patients due to falls less than 60 years and the other 50% are over 60 years. The number of patients younger than 60 years who had spinal fractures due to RTA is more than those patients due to falls.

This agrees with Heidari Pedram⁽⁸⁴⁾ study that showed that the patients who had spinal fractures due to RTA tended to be younger than the patients who had a spinal injury due to fall.

In our study two patients representing 20% of all the studied cases with cervical spine fractures were elderly age group more than 61 years old. The most common cause of trauma at this age group was RTA.

The prevalence of cervical spine fractures among elderly patients is greater than that among all other age groups. The higher incidence of upper cervical injury in the elderly population may be due to the stiffening effect of aging on the vertebral column. Injury distribution in our consecutive study population supports this stiffening thesis, with the C2 vertebra as most frequently injured, followed by the C6. These findings are in agreement with previous studies, which indicate a high frequency of upper cervical spine injury, particularly odontoid fractures and injuries involving the atlantoaxial complex in elderly patients^(91, 92)

Also this is in agreement with Lomoschitz et al.⁽⁹³⁾ that were conducted on 149 patients 65 years old and older over a 5-year interval.

In our study regarding Glasgow coma score (G.C.S), the initial G.C.S on presentation of all patients ranging from 3-8 denoting severe traumatic brain injury distributed as such 3 patients (30%) had GCS 8, one patient (10%) had GCS 7, and 2 patients (20%) had GCS 6, one patient (10%) had GCS 5, one patient (10%) had GCS 4 and 2 patients (20%) had GCS 3.

Regarding correlation between G.C.S and cervical spine injury there is no difference in cervical spine injury in these patients as all patients in this study has severe traumatic brain injury G.C.S 8 or less.

In our study regarding level of cervical spine injury 5 patients (50%) had C2 fractures, 2 patients (20%) had C6 fractures and 3 patients (30%) had multi-level cervical spine fractures. C2 fractures were most common followed by multiple cervical spine injuries.

This is in agreement with Langston T et al. ⁽⁹⁵⁾ study, which revealed that the most frequently injured region of cervical spines was between occiput and C-3. demonstrated in 14 patients (58.3%) of 24 patients

Knowledge of the level of injury and the pattern of diaphragmatic innervation is useful in predicting respiratory insufficiency. Because the diaphragm is supplied by the C3–C5 roots (with the most important supply from the C4 root), spinal cord injury below the level of the C5 root does not affect the function of the diaphragm. However, because the intercostal muscles and other accessory muscles of respiration are enervated by spinal cord injury, hypoventilation will almost always occur. In patients with injuries between the C3 and C5 levels, diaphragmatic function is compromised immediately after injury, and acute respiratory insufficiency occurs.

In our study regarding CT Brain finding revealed that 7 patients (70%) had brain edema, 3 patients (30%) had SAH, 4 patients (40%) had SDH, 7 patients (70%) had IVH&4 patients (40%) had HC. Patient may have more than one CT Brain finding.

In this study brain edema and IVH were most common finding followed by Hemorrhagic contusion and SDH.

There is agreement with Langston T et al. ⁽⁹⁵⁾ study, which revealed that most common finding in head CT scan among 24 patients with combined craniocervical traumatic injury were diffuse swelling in 13 patients , subarachnoid hemorrhage in 12 patients 3 patients with subdural hematoma and 6 patients with multiple contusions .

In our study regarding associated injuries only one patient representing 10% of all patients had no associated injuries. Nine patients representing 90% of all patients had associated injuries. 3 patient (4%) had chest trauma, 6 patient (60%) suffered abdominal injuries, 5 patients (50%) had pelvic injuries, 4 patients (40%) had orthopedic injuries and 3patient (30%) sustained dorsolumber spine fracture .

Regarding this study abdominal injuries, chest injuries, pelvic fractures, orthopedic injuries and other spine fracture were significantly associated with CSI.

There is some agreement with Tomoko Fuji et al ^(96, 98) study which revealed that upper limb fracture .thorax injury and hypotension were significantly associated with CSI. In this study pelvic injuries had an inverse association with CSI explanation in this study that pelvic injury may absorb energy and have protective effects against CSI.

As regarding the hemodynamic stability of the current studied patients, most of them (70%) were hemodynamically unstable and only (30%) were hemodynamically stable.

This may be due to loss of sympathetic tone (consequent to damage to the sympathetic fibers) results in peripheral vasodilatation. This results in a lowering of blood pressure and an inability to respond to environmental temperature changes, leaving the patients susceptible to hypothermia or hyperthermia. Bradycardia, which results from disturbance of sympathetic out flow to the heart and unopposed vagal activity, can be rendered more profound (even to the point of cardiac arrest), by procedures that may be necessary, but which stimulate the vagus. Such procedures (e.g. oropharyngeal suction, endotracheal intubation) should not be carried out in the presence of bradycardia unless atropine has been given or is immediately available.

Discussion

Also lowered blood pressure in this study may be attributed to associated severe life threatening chest or abdominal trauma.

We found that regarding respiratory rate of patients presented with cervical spine injuries was 8-36 cycles / minute with mean of 18 cycles /minute five patients were distressed having RR more than 35 cycles / min.

As regard relation between cervical spine injury and respiratory rate there was no statistical significant relation.

SUMMARY

Trauma patients constitute an important subgroup that comes to our emergency department. The evaluation and management of cervical spine injuries is a core component of the practice of emergency medicine. The incidence of serious cervical spine injuries is low but associated rates of death and disability are high; therefore, the emergency physician must have a strong knowledge base to identify these injuries as well as clinical skills that will protect the patient's spine during assessment.

Cervical spine injury is a very important issue in the field of trauma, as it does not only hamper the function but also causes serious psychological deficiencies. A disproportionate number of cervical spine injuries are associated with moderate and severe head injuries sustained in motor vehicle crashes. Head-injured patients are almost 4 times as likely to have a cervical spine injury as those without head injuries. Those at highest risk have an initial Glasgow Coma Scale (GCS) score of 8 or lower and are likely to sustain unstable injuries in the high cervical spine.

The study was a correlation study included 161 patients with severe blunt head trauma admitted to the emergency department of Alexandria Main University Hospital. The of the work is to determine the incidence and risk factors of cervical spine injury in severe blunt head trauma patients and to illustrate an associated injury or neurological deficit during the first 24 hours of admission .

The study showed that, adult group in the fifth & sixth decades of life was the most age group affected (40%) with range from 18-77 years and mean age of 36, 43.8 years. and the possible explanation for the higher frequency of traumatic spinal fractures in this age group is that the fourth and fifth decades of human life are active decades in life and thus people in these decades are vulnerable to trauma.

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