

## ***INTRODUCTION***

Traumatic spinal cord injury (S.C.I) is not a common condition, but it has a major effect on the injured person's functional, medical, financial, and psychosocial well-being. The male-to-female ratio of individuals with SCI is 4:1, males constituting about 80%. More than 50% of all cases of SCI occur in persons aged 16-30 years.

*The most common causes of SCI include the following: (DeVivo ,2002).*

1- Motor vehicle accidents (44.5%) are the major cause of S.C.I

2-Falls (18.1%) are most common in persons aged 45 years or older.

3-Violence (16.6%) is the most common cause of S.C.I in some urban settings in the United States, with a trend showing a slight decrease in violence as a cause of S.C.I.

4-Sports injuries (12.7%) cause many cases of S.C.I. Diving is the sport in which S.C.I occurs most commonly.

Injury may be traumatic or non-traumatic, A traumatic spinal cord injury may arise from a sudden traumatic blow to the spine that fractures, dislocates, crushes or compresses one or more of vertebrae. It may also result from a gunshot or knife wound that penetrates and cuts the spinal cord. Additional damage usually occurs over days or weeks because of bleeding, swelling, inflammation and fluid accumulation in and around spinal cord. Non-traumatic spinal cord injury may be caused by arthritis, cancer, blood vessel problems, bleeding, inflammation, or disk degeneration of the spine.

Spinal cord injuries are divided into complete and incomplete injuries and can occur anywhere along the spinal cord. Axonal damage causes a loss of communication between the brain and the parts of the body below the injury. Thus, the higher the injury along the spine, the greater the extent of the problems associated with the injury (*Greenberg 2006*).

Management of spinal cord injuries starts before reaching hospital, in the form of adequate immobilization before and during transport to prevent active and passive movements of the spine. The measures includes placing on back board, head fixators, neck collars, in addition to maintaining patent airway and prompt fluid resuscitation.

Stem cells represent natural units of embryonic development and tissue regeneration. Embryonic stem (ES) cells, in particular, possess a nearly unlimited self-renewal capacity and developmental potential to differentiate into virtually any cell type. Human ES cell lines, which have recently been derived, may additionally serve as an unlimited source of cells for regenerative medicine. Current techniques for directed differentiation into somatic cell populations remain inefficient and yield heterogeneous cell populations. The number of human ES cell lines available for research may also be insufficient to adequately determine their therapeutic potential (*Wobus et al, 2005*).

Neuro- rehabilitation is the process of restoration of function for persons with disorders of the nervous system. This process involves application of strategies aimed at reducing impairments, disabilities and handicaps, and ultimately enhancing quality of life for persons with neurological disorders. Rehabilitation involves restoration of functioning or facilitation of compensatory or adaptive functioning. The practice of rehabilitation involves a team process, The patient is the ultimate target of treatment, but at the same time serves as a member of the team. Neurologists now are strongly involved in the practice of rehabilitation (*Gonzales et al; 2000*).

## **Aim of the Essay**

The aim of this essay is to review the main items of management of traumatic spinal cord injuries and to discuss recent modalities of treatment.