

## Spinal Cord Injured Patients: Bait for Research in the Current Millennium

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Traumatic spinal cord injury (SCI) has been regarded as a disabling condition, with an annual worldwide incidence of 15 to 40 cases per million (1). Despite stringent traffic regulations, the incidence of SCI is on the rise leaving in its wake patients who remain handicapped throughout their life and a trail of insurmountable problems for their families and caregivers. SCI, a least understood domain, has a major negative impact on the functional, medical, and financial aspects of the person with the injury, as well as alarmingly deleterious effects on the individual's psychosocial well-being (2).

Treatment of spinal cord injury has always been considered as a herculean task to treat since by gone days because of remarkable morbidity and mortality and a narrow, restricted range of therapeutic options. We cannot express in words the cumulative distress that SCI patients express when they cast an inquisitive look at your eyes if you have any solution for their seemingly hopeless and intractable disease (3). The limbs that were a cardinal part of their bodies now simply appear as supererogatory appendages to them.

Recent advances in realization of neural injury and repair, and the progress thus attained towards the development of neuroprotective and regenerative interventions form the basis for some degree of optimism. So, up till now, the aim had been to lavishly fund all those researchers and their projects that were on the look out to find a panacea for this set of patients who pose an enormous economic burden on the exchequer and an incessant psychological trauma for the families at large and the patients in particular.

Although, there is a paucity of preclinical research, nevertheless, the available literature shows that cell transplants can regenerate neuronal growth and create new connections between neurons. Towards the realization of this goal, researchers are experimenting with a variety of cells; including human oligodendrocyte progenitor cells, schwann cells, bone marrow stromal cells, and nasal olfactory ensheathing cells for efficacy and safety in increasing connectivity and restoring

function following a spinal cord injury. Neural stem cells have opened a new page in the field of regenerative science and medicine (4). However, there has been an evolving debate over the potential benefits and possible harmful consequences of cell transplants. The potential of these cells in offering a cure for SCI patients is being extensively investigated, but there are still some blind alleys that investigators need to understand and resolve to put a stamp of authentication on their prodigious research spending in this field.

In addition, except for some progress shown in lower vertebrates (5) and animals (6) regarding plasticity for central nervous system regeneration, the potential for neuronal regeneration in human is still a utopian dream.

Enough researches have been conducted and exorbitant funds allocated for their execution during the last century and the first decade of the present century and the tempo still remains unabated, but unfortunately nothing concrete could be witnessed that would give a glimpse of hope for the caregivers and their patients.

On the other side, faculties of engineering are inquisitively pursuing this subject and seemingly are optimistic to capture the no man's land in the near future. For example, brain-computer interface technology inherently aims at bypassing the damaged nerve circuits in the spinal cord and establishing a direct link between the brain with an assistive implanted device which may restore an individual's control of voluntary muscle movement and coordination of paralyzed muscles. This hypothesis if correctly executed based on sound protocols and analytical judgments would revolutionize the field and usher in a hope for the dismal outlook of the spinal cord injured patients.

So, based on the nature of spinal cord injuries; especially in chronic SCI subjects, and the extraordinary speed in electronic medical devices, it will not be very far from the mind that electronic technology surpasses the cell transplant and spinal cord

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regeneration in the future.

The current millennium awaits giant leaps in effective management strategies from researchers in offering a solace and a marginal improvement in the daily functions of these patients and a plausible solution for their unremitting illness. They, the patients, are expecting a remedy for their malaise without any ambiguity and we as researchers hope to tide over the crisis in the years to come.

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