Guest Editorial

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Neurotrauma

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Neurotrauma is on the increase, given our *sense*x prosperity sans civic *sense* and driving discipline. The merchants of speed- the vehicle makers- owe a debt to all those whose neurotrauma they promote.

The current phylogenic thought holds the human head-n-neck as but the 5th limb that sticks out of the trunk. Speed, sports, and violence are aplenty around to take toll of this vulnerable part of human anatomy encasing the brain that is no more dense than congealed CSF. Neurotraumatology is now a discipline by itself, boasting of minute basic research and even clinical trials.

There is some trouble with the term *neurotrauma*. Earlier medical lexicons synonymized it with trauma to a nerve. Now neurotrauma also connotes trauma to the neuraxis. Taking advantage of this dichotomy, it is useful to classify neurotrauma using innovative terms pregnant with meaning.

The above tentative attempt prevents the error of terminologically putting grave brain injuries with minor nerve injuries on par with each other. The neologisms aren't complicated and are self-evidently helpful in telling what is injured and what to expect out of reparative efforts.

Neurotrauma, involving the neurons biologically classified as perennial/ postmitotic/ indivisible cells, can spawn no restorative neuronal multiplication. A neurone is a post-mitotic cell- once lost, lost for ever, for it cannot multiply. Our main aim should be to minimize the axial displacement of the central nervous system axis to offer the best chance of healing. Our other ally would be the

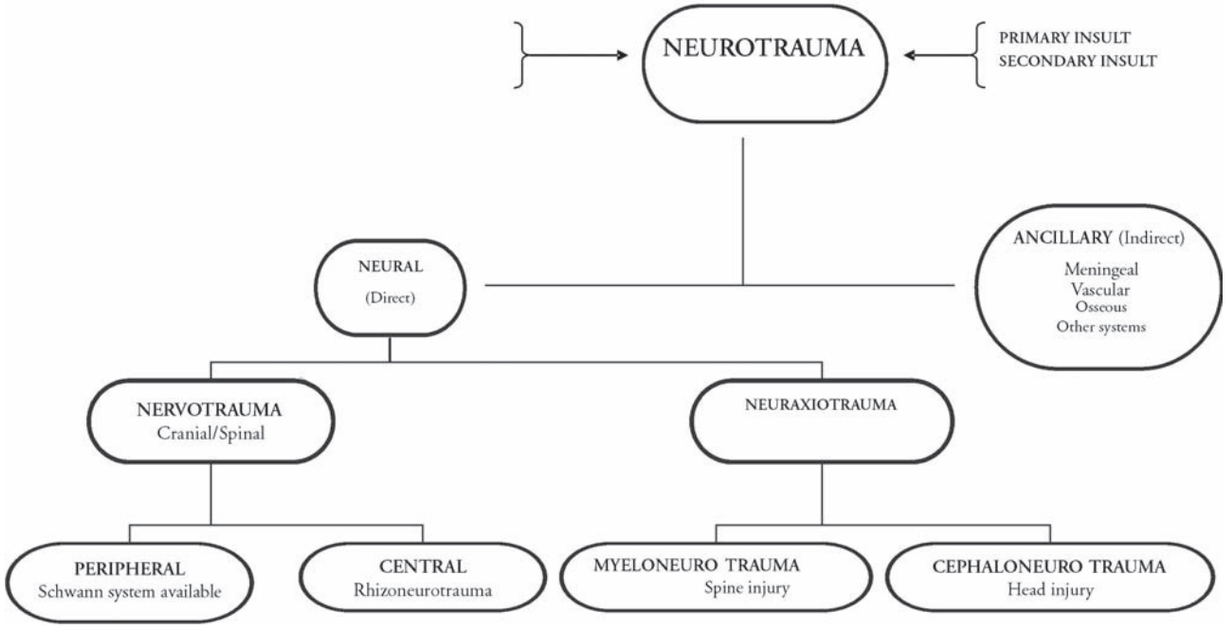

Fig 1

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enormous compensatory mechanism that the brain particularly has.

The entire nervous system, from the ependymal lining to the tips of toes and fingers is a heap of snowflakes, a gigantic non-fibrillar (non-collageneous) cytoma, suspended in an isodense medium called CSF, and perpetually commutative with it. Next to blood, the nervous system is the most unstitchable tissue of the animal body. The stitchability of nervotrauma in its periphery is not of the neural tissue itself, but of the Schwann cell system that ensheathes the nerve to provide to the repairer a semblance of vector-healing. The ancillaries of the nervous system are, like the tyre of a car, repairable. The neural tissue, like the air within, is NOT. Whatever the fill-in-the-gap, healing is by multiplicability of the neurogliocytes (reactive gliosis) which belong to the expanding/mitotic cell population.

'Modern Neurotraumatology' is agog with classifications, grading, monitoring, imaging, quantitative pupillomety clinical advances and trials, neurophysiology, such esoterics as excitotoxicity experimental models, genetics, neurocellular responses to trauma, role of cytokines, growth factors, apoptosis, metabolic studies, and what have you. As of now, the above rush is not translatable into major gains, save those that come from sophisticated imaging modalities that provide instant and clear picture of the site, extent and nature of tissue damage.

The popular adage vis-à-vis microbe was that you can spit into the peritoneum but cannot breathe into a joint. When it comes to neuraxis, you can do both, and a lot more. An innate immunity that neural tissue enjoys against even direct implantation of microbes, intentionally or accidentally, leaves the CNS uninfected. Hence so many head injuries with all the road-muck getting into the brain, and yet such few infections therefrom.

The limitations whatever do not lie so much with the neurotraumatologists as much with the utter inscrutability of wound-healing in general, and of the healing of neurtrauma in particular. Any form or quantum of wound healing to use Churchillian metaphor is 'a riddle wrapped in a mystery inside an enigma'. When it comes to healing, the tissues are a law unto themselves. The best results are with repair of peripheral neurotrauma blessed as the situation is with the stitch-ability of the nerve sheaths and the consequent direction that such a repair provides to the regrowing axons and dendrites,. Naturally, this admits of nerve-grafting as well.

Nature's inscrutable way of holding the cards of any wound-healing close to her chest, forces upon the neurotraumatology a commonsense approach – maintain the vital signs, maintain neural perfusion, control ICT, evacuate intracranial mass lesions, repair the ancillaries, miss no trauma to any other system, and then, like Ambroise Pare (*Je Le pensay et Dieu la guarit*) fold your hands and pray that you having dressed the wound, may God heal them.

'Modern Neurotraumatomy: A brief historical review' [1] ends with a generalization that sums up this essay: 'But it is also important to remember that the basic principles of neurotrauma care, which include adequate oxygenation of the injured brain, adequate blood pressure, early evacuation of intracranial mass lesions, and attention to principles of critical care, will not be replaced by the manipulation of growth factors or the human genome'.

Nowhere in medicine is prevention more important than cure, than in CNS injuries. We need better roads, better traffic sense, and above all sane drivers. A Hellmet (Hell- Mate) has no way of shielding the spine. We need regional centers to provide immediate helicopterised first aid to head-n-spine injuries, for mostly these are young productive lives.

REFERENCE

1. Marshall LF, Marshall SB, Sean Grady M: Modern neurotraumatology: A brief historical review. Chapter 322, In- Youman's Neurological surgery, Editor: Winn HR, 5th Edition, Saunders, 2004, pp 5019-5024.