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Serum NMR metabolomic study in acute spinal cord injury (ASCI): A possible recovery pathfinder as indicated in a pilot study

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Study Design: A prospective case control study of ^{1}H NMR spectroscopic metabolic profiling was done to determine the severity of injury and prognosticate neurological recovery in acute spinal cord injury.

Aim: Aim of this study is to evaluate the level of metabolites with their significance in SCI recovery and to determine the effect of stem cell on their levels in facilitating recovery.

Methods: 20 ASCI recruited subjects were classified into fixation alone (group 1, n=10) and stem cell therapy (group 2, n=10) along with healthy controls (group 0, n=10). Serum samples were isolated at admission as baseline and at 6th month as follow-up. The spectra for serum were acquired using NMR spectrometer and analyzed by Wilcoxon and ANOVA tests to observe difference between three groups on the basis of metabolomic perturbation. Results were correlated with recovery.

Result: Seven out of 15 identified metabolites were found significant for the study. Acetone, acetate, isoleucine and succinate level had direct correlation with recovery and stem cell infusion. Valine level had direct relation with recovery but no relation with stem cell infusion. Glycine level had negative relation with recovery and stem cell infusion. Lactate level had negative relation with recovery but positive relation with stem cell infusion.

Conclusions: Seven metabolites were correlated with injury either positively or negatively. Stem cell behaves differently to these metabolites- most correlate positively, one negatively and one has no correlation.

Biography

Rajeshwar Nath Srivastava is a Researcher and has contributed extensively in the genetics, epigenetics and translational health sciences in the field of osteoarthritis and osteoporosis in Indian population. He has important contributions in the family of Spinal Cord Injury (SCI) researchers. He has developed an indigenized, innovative negative pressure device for bedsores in SCI, a step wise reduction protocol in management of cervical fracture dislocations and an algorithm for processing of bone marrow derived stem cells for clinical use in orthopedic diseases. His research centers on treatment modalities influencing neurological recovery and metabolomics in SCI. He is a recipient of many awards, 45 publications with 288 citations, an H-index of 10 and i-10 index 11 in last five years. He has been a Reviewer of manuscripts in many international journals of repute including *BMJ, Spinal Cord, Spine* and *JSCM*.

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