

Spine Treatment Appraisal Report (STAR): Bone Marrow-Derived Stem Cells Improve Neurological Recovery in Participants With Spinal Cord Injury

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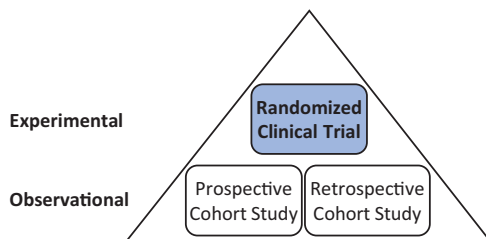
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Srivastava RN, Agrahari AK, Singh A, Chandra T, Raj S. Effectiveness of bone marrow-derived mononuclear stem cells for neurological recovery in participants with spinal cord injury: a randomized controlled trial. *Asian J Transfus Sci.* 2019;13(2):120-128.

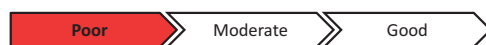
Keywords

randomized controlled trial, RCT, spinal cord injury, bone marrow-derived stem cells, spine stabilization

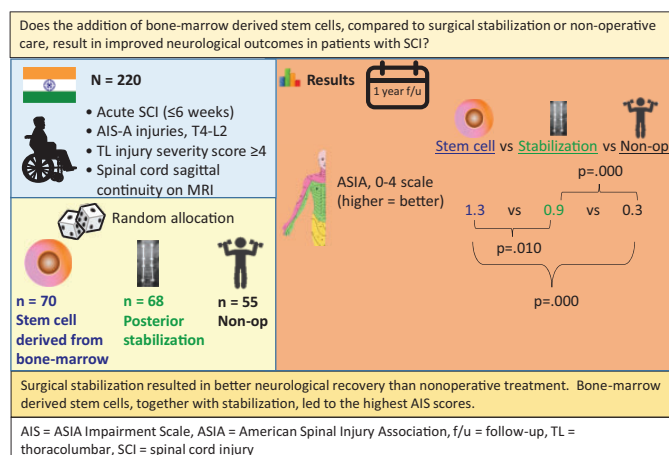
Study Type



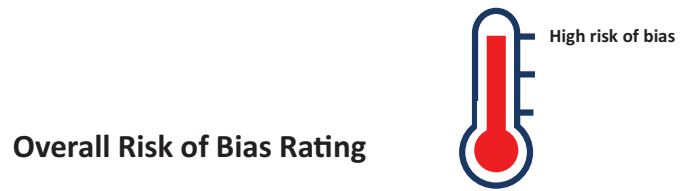
Study Quality:



Visual Abstract



Risk of Bias:



Overall Risk of Bias Rating

| | |
|---------------------------------------|-------|
| Randomization Process | ★ ★ ★ |
| Deviations from intended intervention | ★ ☆ ☆ |
| Missing outcome data | ☆ ☆ ☆ |
| Measurement of the outcome | ★ ☆ ☆ |
| Selection of the reported results | ★ ★ ★ |

Why Is This Study an Important Topic?

Traumatic spinal cord injuries have devastating consequences affecting individuals, caregivers and society. Current treatment options that substantially improve neurological recovery are limited.

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Clinical trials of new modalities treating traumatic spinal cord injuries, such as bone-marrow derived stem cells, are much needed.

What Was the Primary Clinical Question?

Does the addition of bone-marrow derived stem cells, compared to surgical stabilization or non-operative care, result in improved neurological outcomes in patients with SCI?

Study Characteristics

Population: Included: SCI Patients 18-65 years, duration of injury <6 weeks, AIS-A grade, TL injury severity score ≥4, sagittal continuity of spinal cord and presence of cord hemorrhage on MRI.
Excluded: Polytrauma patients with associated thoraco-abdominal injuries and/or head injury; medically unfit for surgery; other comorbid conditions such as osteoporosis, pressure sores (Grade III-IV), psychiatric illness; those taking steroids or other immune suppressants.

Intervention: Group 1, Stem cell augmentation: Posterior instrumentation followed by infusion of autologous BM-derived stem cells as an adjuvant (n=70, mean age=31 years, 90% male)

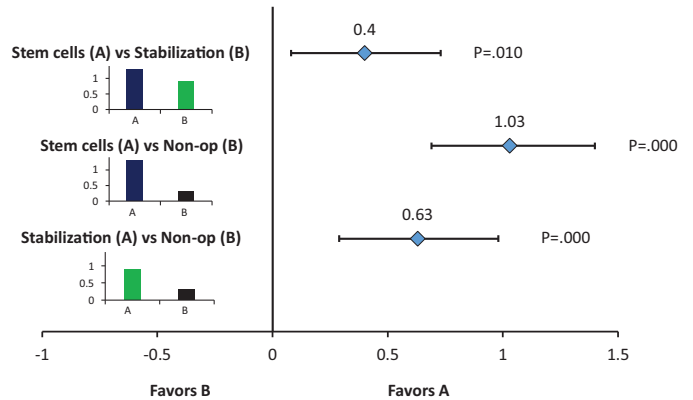
Comparison: Group 2, Spine stabilization: Posterior instrumentation (n=68, mean age 31 years, 85% male)
 Group 3, Non-operative care: Conservative management (n=55, mean age 33 years, 80% male)

Outcomes: American Spinal Injury Association (ASIA) Impairment Scale (AIC) (higher=better)
 Sensory deficit (higher=better)
 Motor deficit (higher=better)

Time: Follow-up: 1 year

Results

Result 1. Mean differences in Spinal Injury Association (ASIA) Impairment Scale 1 year following injury.



Result 2. Motor and Sensory Scores (higher = better) 1 year following injury.

| | Stem Cells | Stabilization | Non-op |
|---------|--------------|---------------|--------------|
| Motor | 58.8 ± 10.7 | 54.3 ± 6.3 | 51.6 ± 5.1 |
| Sensory | 169.3 ± 18.6 | 160.8 ± 21.4 | 150.3 ± 16.9 |

How Will This Affect the Care of My Patients?

Surgery should be considered over non-operative care when indicated. In addition to surgical stabilization, one bone-marrow derived stem cells should also be considered.