Guidelines for the Management of Patients With Spinal Cord Injury: The Use of Methyprednisolone Sodium Succinate

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Introduction

Given its potent anti-inflmmatory actions, methylprednisolone sodium succinate (MPSS) has a long history of use across a wide spectrum of disease. The objective of this study is to develop guidelines that outline the appropriate use of MPSS in patients with traumatic spinal cord injury.

Methods

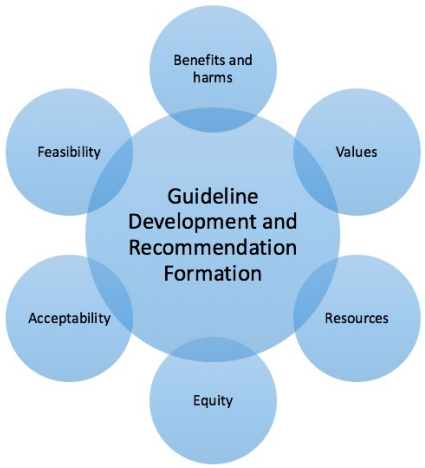
A systematic review of the literature was conducted to address the following key questions: (1) what is the efficacy, effectiveness and safety of MPSS compared with no pharmacologic treatment?; and (2) what is the evidence that MPSS has differential efficacy or safety in subpopulations?

Inclusion and Exclusion Criteria

Study Component	Inclusion	Exclusion
Participants	Adults with traumatic acute spinal cord injury (complete or incomplete)	• Pediatric patients < 13 years old • Pregnancy • Penetrating injuries to spinal cord • Cord compression due to tumor, hematoma, degenerative disease (e.g. CSM) • Patients without neurological deficit following trauma
Intervention	MPSS	
Comparators	• Placebo • Standard care without pharmacologic intervention	
Outcomes	*Efficacy/effectiveness* • Change in motor scores • Change in sensation (light touch, pinprick) *Safety* • Complications, adverse events • Death	• Non-clinical outcomes
Study Design	• KQ 1, 2, 3: Comparative studies (RCTs and observational studies with concurrent controls) • F/U rate of at least 50% • n ≥ 10 per group • Observational comparative studies must control for severity of spinal cord injury as evaluated by motor status at baseline and/or complete or incomplete injury • KQ 3: Subgroup analyses from comparative studies.	• Animal studies • Non-clinical studies • F/U rate of at <50% • n < 10 per group • No control for injury severity
Publication	• Studies published or translated into English in peer reviewed journals.	• Abstracts, editorials, letters • Duplicate publications of the same study which do not report on different outcomes • Single reports from multicenter trials • White papers • Narrative reviews • Articles identified as preliminary reports when results are published in later versions

A multidisciplinary guideline development group used this information, in combination with their clinical expertise, to develop recommendations for the use of MPSS. The benefits and harms, financial impact, acceptability, feasibility and patient preferences of each recommendation were carefully considered.

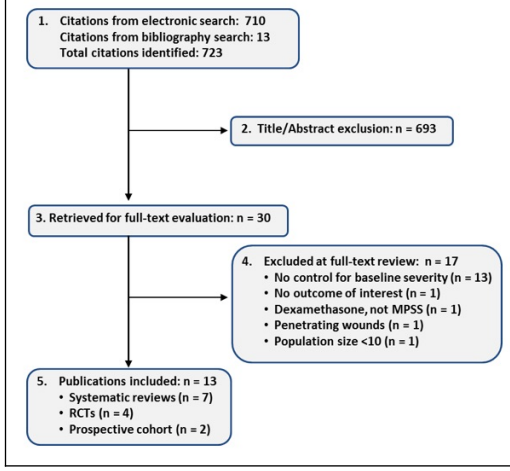
From Evidence to Recommendations: Important Considerations



Results

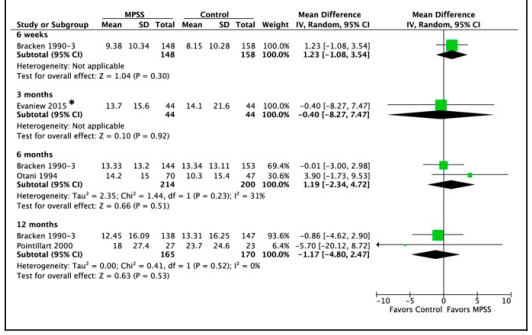
Three randomized controlled trials (four publications) and one prospective cohort study evaluated the efficacy and safety of MPSS, while three additional studies (two randomized controlled trials and one prospective cohort study) provided further evidence on its safety.

Overview of Search Strategy



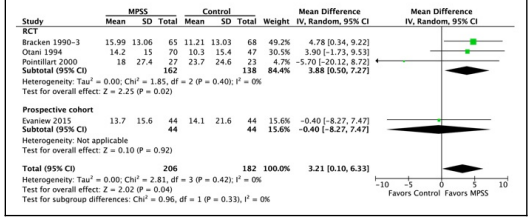
1) There were no differences in motor scores at any time point in patients treated with MPSS compared to those not receiving steroids. Pinprick sensation was significantly improved at six months in one randomized controlled trial but not in two other trials at 12 months. Similar results were seen for light touch.

Impact of MPSS Administration on Motor Outcomes



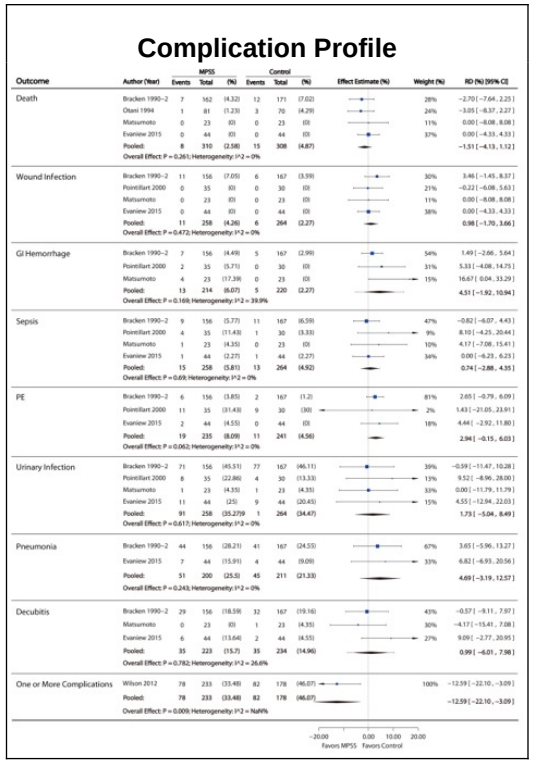
2) When MPSS was administered within 8 hours of injury, pooled results at 6- and 12-months indicate modest improvements (3.88, 95% CI: 0.50, 7.27, p=0.02) in mean motor scores in the MPSS group compared with the control group.

Motor Scores in Patients Treated with MPSS within 8 hours of Injury



3) There was no statistical difference between treatment groups in the risk of death, wound infection, GI hemorrhage, sepsis, urinary tract infection pneumonia or decubiti.

Complication Profile



Evidence Based Recommendations and Guidelines

Our recommendations were: (1) "We suggest not offering a 24-hour infusion of high dose MPSS to adult patients who present after 8 hours of acute SCI"; (2) "We suggest that a 24 hour infusion of high dose MPSS be offered to adult patients within 8 hours of acute SCI as a treatment option"; and (3) "We suggest not offering a 48-hour infusion of high dose MPSS for adult patients with acute SCI."

Conclusions

These guidelines should be implemented into clinical practice to improve outcomes and reduce morbidity in patients with SCI by encouraging clinicians to make evidence-informed decisions.