II SUMMIT
CONECTANDO EMERGENCISTAS
COMPARTILHANDO EVIDÊNCIAS

ABRAMEDE
ASSOCIAÇÃO BRASILEIRA DE MEDICINA DE EMERGÊNCIA

26 - 27 de novembro - ON-LINE

Corticoides en trauma medular

Corticosteroides em trauma raquimedular

Palestrante:

Prof. Dr. Silvio Luis Aguilera

Epidemiología lesión medular

Sexo: 78% hombres

Edad promedio: 43 años

Incidencia: 10 a 90 x millón

Mortalidad: 48-79% desde atención a SE

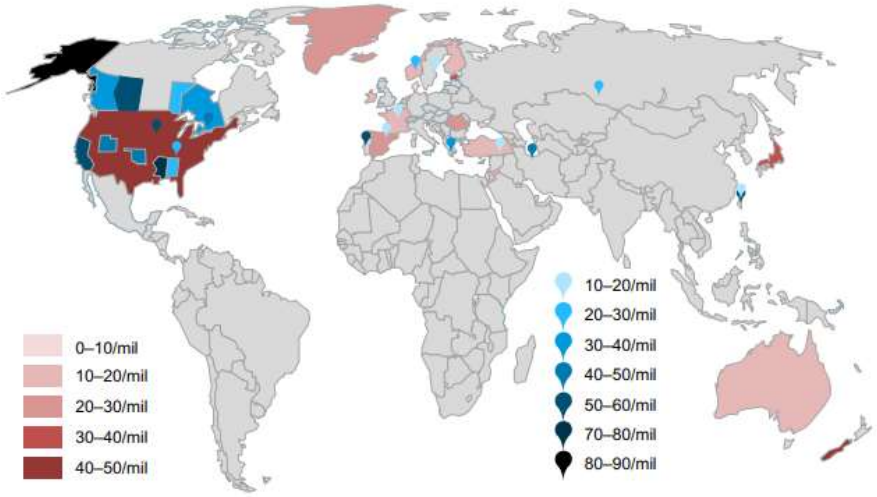
Epidemiologia da lesão medular

Sexo: 78% masculino

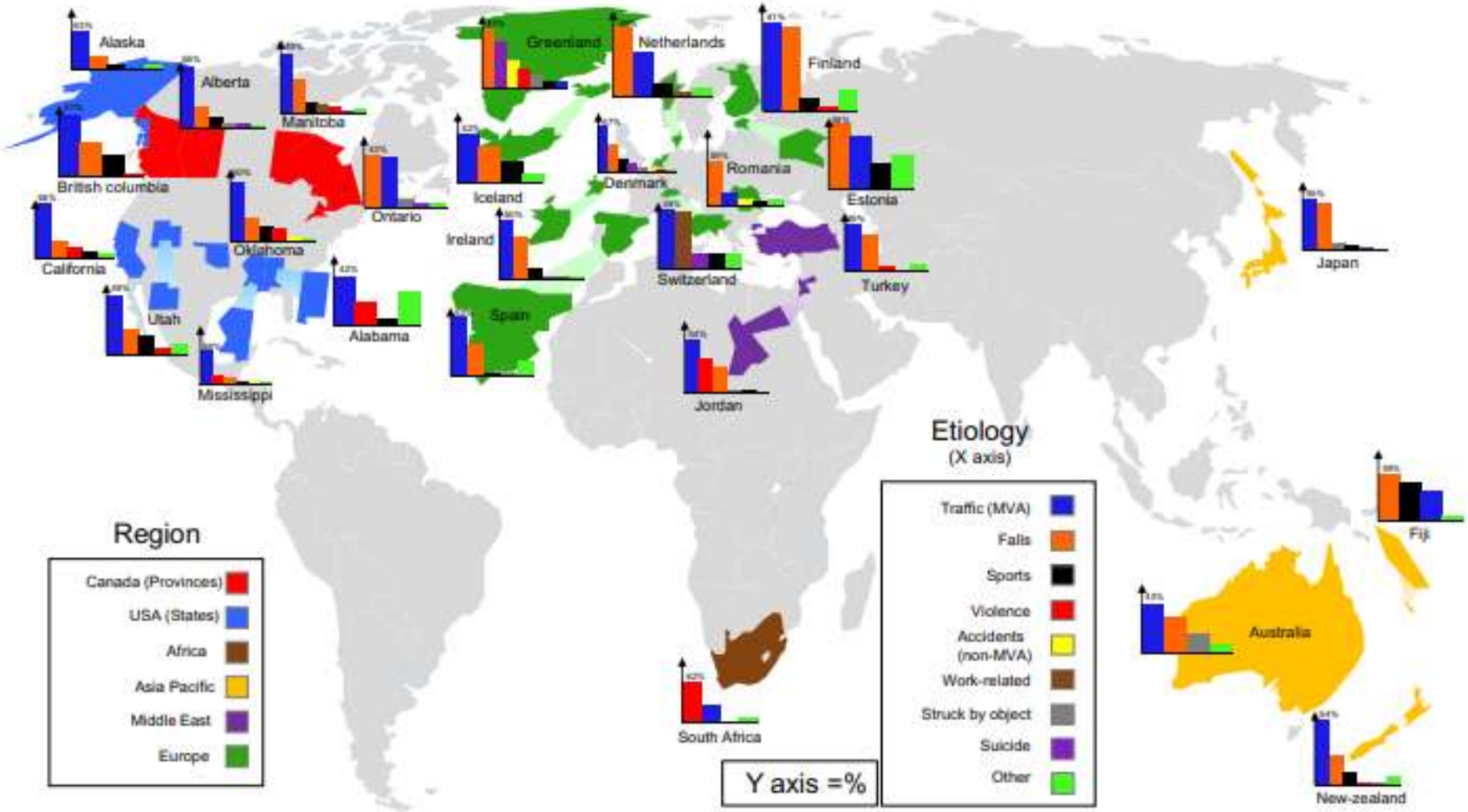
Idade média: 43 anos

Incidência: 10 a 90 x milhões

Mortalidade: 48-79% do atendimento ao SE



Singh, Anoushka, et al. "Global prevalence and incidence of traumatic spinal cord injury." *Clinical epidemiology* 6 (2014): 309.

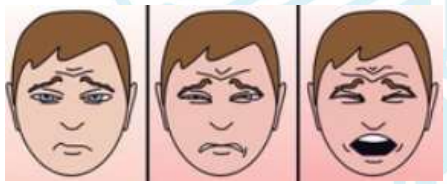

Alaska
Alberta
British columbia
Manitoba
Ontario
California
Oklahoma
Utah
Alabama
Mississippi
Greenland
Netherlands
Finland
Iceland
Denmark
Romania
Estonia
Ireland
Switzerland
Turkey
Spain
Jordan
Japan
Fiji
Australia
New-zealand
South Africa
Region
Canada (Provinces)
USA (States)
Africa
Asia Pacific
Middle East
Europe
Etiology
(X axis)
Traffic (MVA)
Falls
Sports
Violence
Accidents (non-MVA)
Work-related
Struck by object
Suicide
Other
Y axis =%

Peor pronóstico

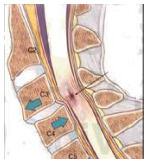
- Lesión más cefálica de la columna (52% -56% ocurren entre C1 y C7/T1)
- Puntuación más baja en la escala de coma de Glasgow en la presentación
- Grado más alto (A) de la American Spinal Injury Association (ASIA)
- Mayor edad
- Politraumatismo

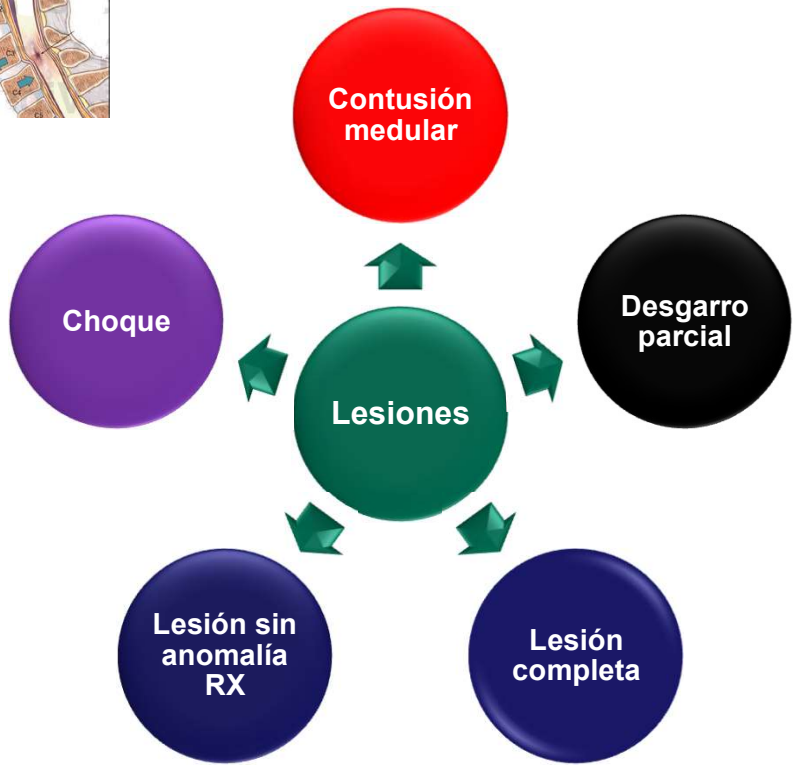
Pior prognóstico

- Lesão mais cefálica da coluna (52% -56% ocorrem entre C1 e C7/T1)
- Pontuação inferior da escala de coma de Glasgow na apresentação
- Maior nota (A) da American Spinal Injury Association (ASIA)
- Mais velho
- Politrauma

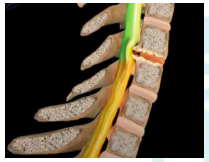


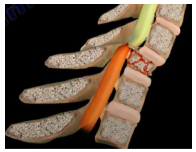
Tipo de Lesiones





Tipo de Lesões





Diagnóstico lesión medular

Diagnóstico de lesão medular

Nivel neurológico sensitivo

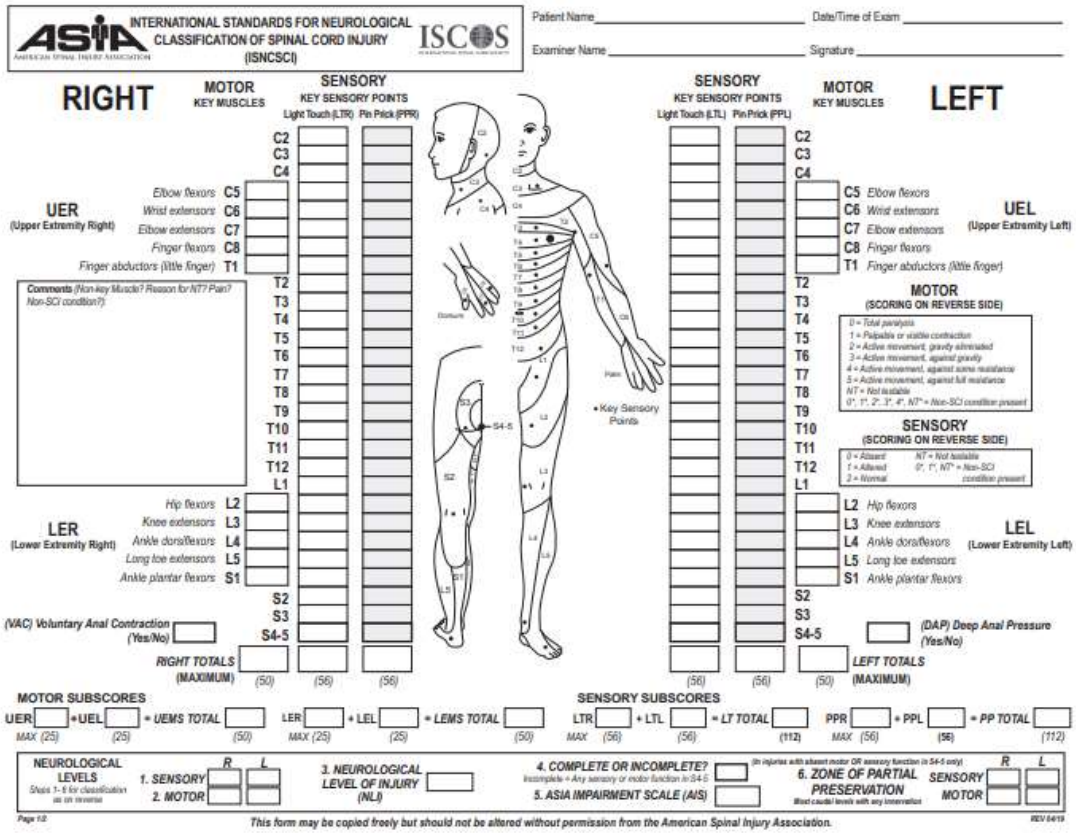
Nivel neurológico motor

Nivel de lesión neurológica

Lesión completa?

Lesión incompleta?

Escala ASIA



Nível neurológico sensível

Nível neurológico motor

Nível de lesão neurológica

Lesão completa?

Lesão incompleta?

Escala ASIA

https://asia-spinalinjury.org/wp-content/uploads/2019/10/ASIA-ISCOS-Worksheet_10.2019_PRINT-Page-1-2.pdf

Diagnóstico medular

Muscle Function Grading

0 = Total paralysis

1 = Palpable or visible contraction

2 = Active movement, full range of motion (ROM) with gravity eliminated

3 = Active movement, full ROM against gravity

4 = Active movement, full ROM against gravity and moderate resistance in a muscle specific position

5 = (Normal) active movement, full ROM against gravity and full resistance in a functional muscle position expected from an otherwise unimpaired person

NT = Not testable (i.e. due to immobilization, severe pain such that the patient cannot be graded, amputation of limb, or contracture of > 50% of the normal ROM)

0*, 1*, 2*, 3*, 4*, NT* = Non-SCI condition present *

Sensory Grading

0 = Absent **1** = Altered, either decreased/impaired sensation or hypersensitivity

2 = Normal **NT** = Not testable

0*, 1*, NT* = Non-SCI condition present *

Note: Abnormal motor and sensory scores should be tagged with a '' to indicate an impairment due to a non-SCI condition. The non-SCI condition should be explained in the comments box together with information about how the score is rated for classification purposes (at least normal / not normal for classification).

When to Test Non-Key Muscles:

In a patient with an apparent AIS B classification, non-key muscle functions more than 3 levels below the motor level on each side should be tested to most accurately classify the injury (differentiate between AIS B and C).

Movement	Root level
Shoulder: Flexion, extension, adbuction, adduction, internal and external rotation **Elbow:** Supination	C5
Elbow: Pronation **Wrist:** Flexion	C6
Finger: Flexion at proximal joint, extension **Thumb:** Flexion, extension and abduction in plane of thumb	C7
Finger: Flexion at MCP joint **Thumb:** Opposition, adduction and abduction perpendicular to palm	C8
Finger: Abduction of the index finger	T1
Hip: Adduction	L2
Hip: External rotation	L3
Hip: Extension, abduction, internal rotation **Knee:** Flexion **Ankle:** Inversion and eversion **Toe:** MP and IP extension	L4
Hallux and Toe: DIP and PIP flexion and abduction	L5
Hallux: Adduction	S1

ASIA Impairment Scale (AIS)

A = Complete. No sensory or motor function is preserved in the sacral segments S4-5.

B = Sensory Incomplete. Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-5 (light touch or pin prick at S4-5 or deep anal pressure) AND no motor function is preserved more than three levels below the motor level on either side of the body.

C = Motor Incomplete. Motor function is preserved at the most caudal sacral segments for voluntary anal contraction (VAC) OR the patient meets the criteria for sensory incomplete status (sensory function preserved at the most caudal sacral segments S4-5 by LT, PP or DAP), and has some sparing of motor function more than three levels below the ipsilateral motor level on either side of the body. (This includes key or non-key muscle functions to determine motor incomplete status.) For AIS C – less than half of key muscle functions below the single NLI have a muscle grade ≥ 3.

D = Motor Incomplete. Motor incomplete status as defined above, with at least half (half or more) of key muscle functions below the single NLI having a muscle grade ≥ 3.

E = Normal. If sensation and motor function as tested with the ISNCSCI are graded as normal in all segments, and the patient had prior deficits, then the AIS grade is E. Someone without an initial SCI does not receive an AIS grade.

Using ND: To document the sensory, motor and NLI levels, the ASIA Impairment Scale grade, and/or the zone of partial preservation (ZPP) when they are unable to be determined based on the examination results.

ASIA
AMERICAN SPINAL INJURY ASSOCIATION

INTERNATIONAL STANDARDS FOR NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY

ISCOS
INTERNATIONAL SPINAL CORD SOCIETY

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Steps in Classification

The following order is recommended for determining the classification of individuals with SCI.

1. Determine sensory levels for right and left sides.
The sensory level is the most caudal, intact dermatome for both pin prick and light touch sensation.

2. Determine motor levels for right and left sides.
Defined by the lowest key muscle function that has a grade of at least 3 (on supine testing), providing the key muscle functions represented by segments above that level are judged to be intact (graded as a 5).
Note: in regions where there is no myotome to test, the motor level is presumed to be the same as the sensory level, if testable motor function above that level is also normal.

3. Determine the neurological level of injury (NLI).
This refers to the most caudal segment of the cord with intact sensation and antigravity (3 or more) muscle function strength, provided that there is normal (intact) sensory and motor function rostrally respectively.
The NLI is the most cephalad of the sensory and motor levels determined in steps 1 and 2.

4. Determine whether the injury is Complete or Incomplete.
(i.e. absence or presence of sacral sparing)
*If voluntary anal contraction = **No** AND all S4-5 sensory scores = **0** AND deep anal pressure = **No**, then injury is **Complete**.*
*Otherwise, injury is **Incomplete**.*

5. Determine ASIA Impairment Scale (AIS) Grade.
Is injury Complete? If YES, AIS=A
NO ↓
Is injury Motor Complete? If YES, AIS=B
NO ↓ (No=voluntary anal contraction OR motor function more than three levels below the motor level on a given side, if the patient has sensory incomplete classification)

Are at least half (half or more) of the key muscles below the neurological level of injury graded 3 or better?
NO ↓ **AIS=C**
YES ↓ **AIS=D**

If sensation and motor function is normal in all segments, AIS=E
Note: AIS E is used in follow-up testing when an individual with a documented SCI has recovered normal function. If at initial testing no deficits are found, the individual is neurologically intact and the ASIA Impairment Scale does not apply.

6. Determine the zone of partial preservation (ZPP).
The ZPP is used only in injuries with absent motor (no VAC) OR sensory function (no DAP, no LT and no PP sensation) in the lowest sacral segments S4-5, and refers to those dermatomes and myotomes caudal to the sensory and motor levels that remain partially innervated. With sacral sparing of sensory function, the sensory ZPP is not applicable and therefore "NA" is recorded in the block of the worksheet. Accordingly, if VAC is present, the motor ZPP is not applicable and is noted as "NA".

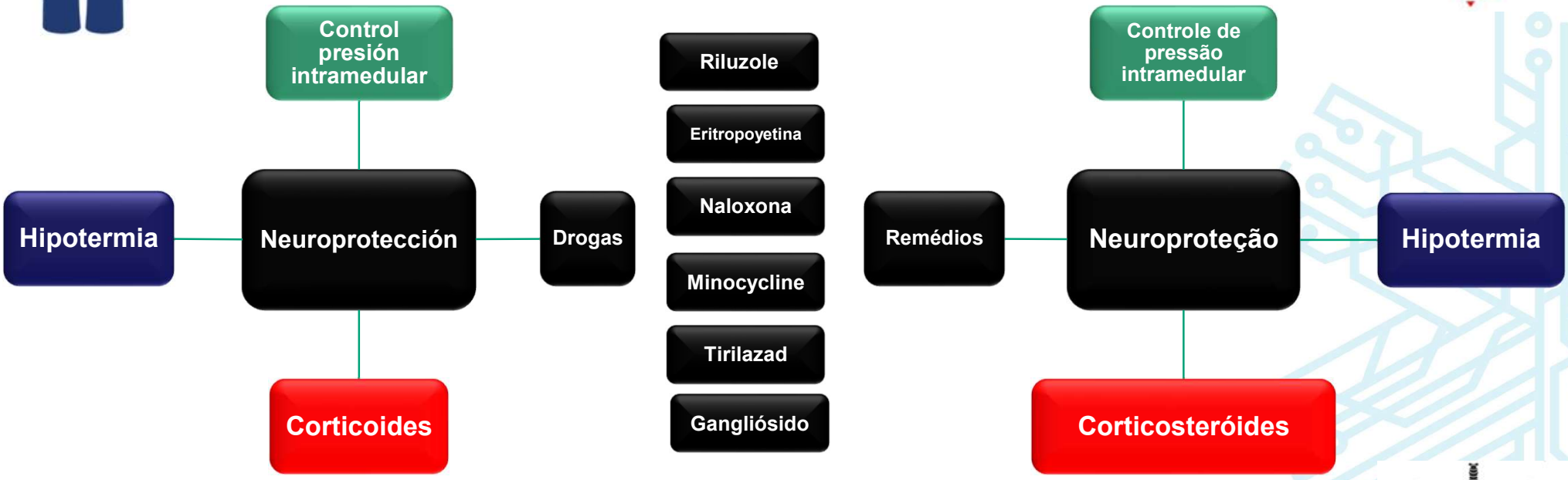
https://asia-spinalinjury.org/v

Manejo

- Neuroprotección
- Manejo del dolor
- Momento de la cirugía
- Profilaxis antitrombótica

Gestão

- Neuroproteção
- Tratamento da dor
- Tempo de cirurgia
- Profilaxia antitrombótica



Fiani, Brian, et al. "Current updates on various treatment approaches in the early management of acute spinal cord injury." Reviews in the Neurosciences (2021).

National Acute Spinal Cord Injury Studies (NASCIS) I, II, III

(multicenter double-blinded randomized control trials: 1984, 1990, 1997)

NASCIS I : 1984

Original Contributions

JAMA
THE JOURNAL of the American Medical Association
Jan 6, 1984 Vol 251, No. 1

Efficacy of Methylprednisolone in Acute Spinal Cord Injury

Michael B. Bracken, PhD; William F. Collins, MD; Daniel F. Freeman, PhD; Mary Jo Shepard, MPH; Franklin W. Wagner, MD; Robert M. Silten, MPH; Karen G. Hellenbrand, MPH; Joseph Ransohoff, MD; William E. Hunt, MD; Phaner L. Perot, Jr, MD; Robert G. Grossman, MD; Barth A. Green, MD; Howard M. Eisenberg, MD; Nathan Rifkinson, MD; Joseph H. Goodman, MD; John N. Meagher, MD; Boguslav Fischer, MD; Guy L. Clifton, MD; Eugene S. Flamm, MD; Stephen E. Rawe, MD

- Droga: metilprednisolona
- Dosis alta vs dosis estándar
- Dosis alta: bolo de 1.000 mg y luego diariamente durante diez días
- Dosis estándar: bolo de 100 mg y luego diariamente durante diez días
- Pacientes: 330 pacientes con lesión aguda de la médula espinal

- Medicamento: metilprednisolona
- Dose alta vs dose padrão
- Dose alta: bolus de 1.000 mg e depois diariamente por dez dias
- Dose padrão: 100 mg em bolus e depois diariamente por dez dias
- Pacientes: 330 pacientes com lesão medular aguda

Bracken, Michael B., et al. "Efficacy of methylprednisolone in acute spinal cord injury." *Jama* 251.1 (1984): 45-52.

NASCIS I : 1984

Summary Statistics for Steroid Effects Six Weeks and Six Months After Injury

Sensory Modality	Mean Change (1)‡	SD (2)	Sample Size (3)	Dose-Specific Adjusted Change		*P* Value for Dose Effect (6)	Model *df* (7)
				High (4)	Low (5)		
Six Weeks							
Motor score, all	−6.0	11.1	258	−8.2	−8.8	.63	15
Plegic: total sensory loss	−1.9	6.0	142	−1.7	−2.8	.31	12
Plegic: partial sensory loss	−14.0	15.7	44	−25.8	−30.3	.33	9
Paretic: variable sensory loss	−9.3	11.7	72	−14.2	−10.4	.10	12
Pinprick	−4.1	10.5	258	−7.1	−6.2	.44	15
Light touch	−4.5	9.8	258	−7.4	−7.0	.68	15
Six Months							
Motor score, all	−10.0	11.2	179	−13.2	−14.1	.59	15
Plegic: total sensory loss	−6.0	10.0	102	−8.3	−7.8	.82	12
Plegic: partial sensory loss	−16.6	11.5	27	−30.5	−30.8	.95	7
Paretic: variable sensory loss	−14.4	8.7	50	−19.5	−20.2	.81	11
Pinprick	−6.4	9.7	178	−9.4	−9.9	.71	15
Light touch	−6.8	9.5	177	−10.4	−10.4	.96	15

NASCIS I : 1984

Sin placebo!!!!!

Rates and Relative Risk of Complications by Steroid Protocol

Complication	Steroid Protocol, %		Relative Risk (95% CL)
	High Dose (n=151)	Low Dose (n=153)	
Urinary tract infection	35.4	30.1	1.18 (0.86, 1.63)
Pneumonia	17.9	19.0	0.94 (0.63, 1.42)
Decubitus	16.0	11.8	1.36 (0.77, 2.40)
Gastrointestinal tract hemorrhage	9.9	8.5	1.17 (0.58, 2.38)
Wound infection	9.3	2.6	3.55 (1.20, 10.59)
Sepsis	8.6	5.2	1.65 (0.71, 3.86)
Arrhythmia	7.3	7.8	0.93 (0.63, 1.39)
Thrombophlebitis	5.3	5.9	0.90 (0.36, 2.26)
Pulmonary embolus	4.6	2.6	1.78 (0.53, 6.03)
Paralytic ileus	4.0	3.3	1.21 (0.38, 3.86)
Congestive heart failure	2.0	2.6	0.76 (0.17, 3.31)
Myocardial infarction	0.7	2.0	0.34 (0.04, 3.07)
Angina pectoris	0.0	0.0	1.00 (not estimable)

Sem placebo!!!!!

Oopps!

NASCIS II : 1990

The New England
Journal of Medicine

Volume 322 MAY 17, 1990 Number 20

A RANDOMIZED, CONTROLLED TRIAL OF METHYLPREDNISOLONE OR NALOXONE IN THE TREATMENT OF ACUTE SPINAL-CORD INJURY

Results of the Second National Acute Spinal Cord Injury Study

MICHAEL B. BRACKEN, PH.D., MARY JO SHEPARD, M.P.H., WILLIAM F. COLLINS, M.D., THEODORE R. HOLFORD, PH.D., WISE YOUNG, M.D., DAVID S. BASKIN, M.D., HOWARD M. EISENBERG, M.D., EUGENE FLAMM, M.D., LINDA LEO-SUMMERS, M.P.H., JOSEPH MAROON, M.D., LAWRENCE F. MARSHALL, M.D., PHANOR L. PEROT, JR., M.D., JOSEPH PIEPMEIER, M.D., VOLKER K.H. SONNTAG, M.D., FRANKLIN C. WAGNER, M.D., JACK E. WILBERGER, M.D., AND H. RICHARD WINN, M.D.

- Droga: metilprednisolona (MP), naloxona
- MP vs naloxona vs placebo
- MP: bolo de 30 mg/kg y luego infusión 5.4 mg/kg durante 24 hs
- Naloxona: bolo de 5.4 mg/kg y luego infusión 4 mg/kg durante 24 hs
- Pacientes: 487 pacientes con lesión aguda de la médula espinal

- Medicamento: metilprednisolona (MP), naloxona
- MP vs naloxona vs placebo
- MP: bolus de 30 mg/kg e, em seguida, infusão de 5,4 mg/kg ao longo de 24 horas
- Naloxona: bolus de 5,4 mg/kg e, em seguida, infusão de 4 mg/kg ao longo de 24 horas
- Pacientes: 487 pacientes com lesão medular aguda

Bracken, Michael B., et al. "A randomized, controlled trial of methylprednisolone or naloxone in the treatment of acute spinal-cord injury: results of the Second National Acute Spinal Cord Injury Study." *New England Journal of Medicine* 322.20 (1990): 1405-1411.

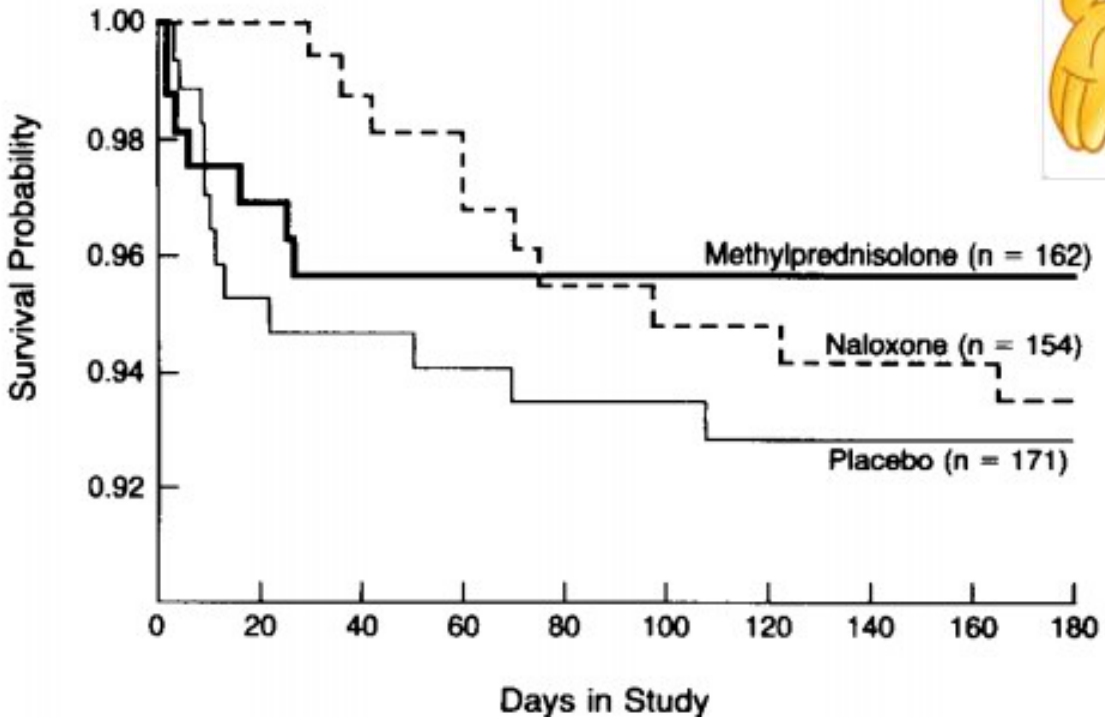
NASCIS II : 1990

Change in Neurologic Measures Six Weeks and Six Months after Injury in Patients Who Received the Study Drug within Eight Hours of Injury

Category of Injury and Measure	Six Weeks			Six Months		
	Methyl-prednisolone	Naloxone	Placebo	Methyl-prednisolone	Naloxone	Placebo
	change in score (P value)					
Plegic with total sensory loss						
No. of patients	*47*	*37*	*46*	*45*	*34*	*44*
Motor	6.2 (0.021)	3.2 (0.394)	1.3 (R)	10.5 (0.019)	7.5 (0.254)	4.2 (R)
Pinprick	5.9 (0.062)	3.0 (0.690)	2.2 (R)	9.4 (0.028)	4.2 (0.947)	4.0 (R)
Touch	6.8 (0.051)	3.7 (0.622)	2.6 (R)	9.7 (0.050)	7.1 (0.374)	4.7 (R)
Plegic with partial sensory loss						
No. of patients	*5*	*12*	*6*	*5*	*11*	*6*
Motor	14.4 (0.564)	14.1 (0.447)	18.0 (R)	23.0 (0.652)	28.9 (0.711)	26.5 (R)
Pinprick	11.8 (0.168)	13.9 (0.037)	4.0 (R)	11.6 (0.803)	18.4 (0.152)	9.8 (R)
Touch	4.4 (0.515)	7.1 (0.204)	0.3 (R)	0.0 (0.479)	13.5 (0.181)	5.2 (R)
Paretic with variable sensory loss						
No. of patients	*14*	*12*	*17*	*12*	*11*	*17*
Motor	18.3 (0.054)	12.7 (0.635)	10.8 (R)	24.3 (0.018)	14.5 (0.738)	12.9 (R)
Pinprick	10.7 (0.368)	8.2 (0.844)	7.5 (R)	14.3 (0.133)	9.6 (0.633)	7.5 (R)
Touch	3.8 (0.518)	6.1 (0.237)	1.2 (R)	7.6 (0.174)	6.2 (0.285)	1.0 (R)

NASCIS II : 1990

P = 0.465



Conclusiones

- Metilprednisolona
- Naloxona
- Placebo
- Lesión completa
- Lesión completa
- ≤ 8 horas desde el inicio de la lesión
- > 8 horas desde el inicio de la lesión

Conclusões

NASCIS II : 1990

- Metilprednisolona
- Naloxone
- Placebo
- Lesão completa
- Lesão completa
- ≤ 8 horas a partir do início da lesão
- > 8 horas a partir do início da lesão

NASCIS III : 1997

Administration of Methylprednisolone for 24 or 48 Hours or Tirilazad Mesylate for 48 Hours in the Treatment of Acute Spinal Cord Injury

Results of the Third National Acute Spinal Cord Injury Randomized Controlled Trial

Michael B. Bracken, PhD; Mary Jo Shepard, MPH; Theodore R. Holford, PhD; Linda Leo-Summers, MPH; E. Francois Aldrich, MD; Mahmood Fazl, MD; Michael Fehlings, MD, PhD; Daniel L. Herr, MD; Patrick W. Hitchon, MD; Lawrence F. Marshall, MD; Russ P. Nockels, MD; Valentine Pascale, RPh; Phanor L. Perot, Jr, MD, PhD; Joseph Piepmeier, MD; Volker K. H. Sonntag, MD; Franklin Wagner, MD; Jack E. Wilberger, MD; H. Richard Winn, MD; Wise Young, MD, PhD; for the National Acute Spinal Cord Injury Study

- Droga: metilprednisolona (MP), Tirilazad
- MP 24 hs vs MP 48 hs vs Tirilazad 48 hs
- Bolo de 30 mg/kg de MP a todos
- MP: infusión 5.4 mg/kg durante 24 o 48 hs
- Tirilazad: infusión 2.5 mg/kg c/6 hs durante 48 hs
- Pacientes: 499 pacientes con lesión aguda de la médula espinal (el inicio de la lesión ≤ 8 horas)

- Medicamento: metilprednisolona (MP), Tirilazad
- MP 24 hs vs MP 48 hs vs Tirilazad 48 horas
- Bolus de 30 mg/kg de PM para todos
- MP: infusão de 5,4 mg/kg em 24 ou 48 horas
- Tirilazad: infusão de 2,5 mg/kg a cada 6 horas por 48 horas
- Pacientes: 499 pacientes com lesão medular aguda (início da lesão: ≤ 8 horas)

Bracken, Michael B., et al. "Administration of methylprednisolone for 24 or 48 hours or tirilazad mesylate for 48 hours in the treatment of acute spinal cord injury: results of the Third National Acute Spinal Cord Injury Randomized Controlled Trial." *Jama* 277.20 (1997): 1597-1604.

NASCIS III : 1997

Administration of Methylprednisolone for 24 or 48 Hours or Tirilazad Mesylate for 48 Hours in the Treatment of Acute Spinal Cord Injury

Results of the Third National Acute Spinal Cord Injury Randomized Controlled Trial

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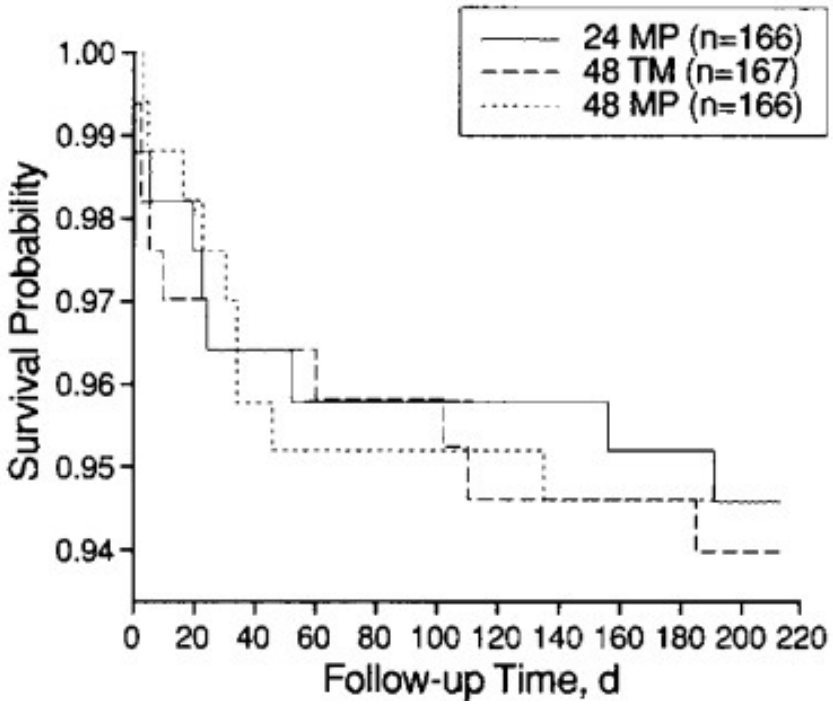


P = 0.97

Bracken, Michael B., et al. "Administration of methylprednisolone for 24 or 48 hours or tirilazad mesylate for 48 hours in the treatment of acute spinal cord injury: results of the Third National Acute Spinal Cord Injury Randomized Controlled Trial." *Jama* 277.20 (1997): 1597-1604.

Conclusiones

- ≤ 8 horas desde el inicio de la lesión
- MP: Bolo de 30 mg/kg
- MP: infusión 5.4 mg/kg
- < 3 horas desde el inicio de la lesión
  - Metilprednisolona 24 hs
- 3-8 horas desde el inicio de la lesión
  - Metilprednisolona 48 hs

Conclusões

NASCIS III : 1997

- ≤ 8 horas a partir do início da lesão
- MP: Bolus de 30 mg/kg
- MP: infusão de 5,4 mg/kg
- <3 horas a partir do início da lesão
  - Metilprednisolona 24 horas
- 3-8 horas a partir do início da lesão
  - Metilprednisolona 48 horas

Evolución

- 2002: AANCS: MP si ≤ 8 horas desde el inicio de la lesión
- 2013: AANCS: No usar por efectos secundarios (sin nueva evidencia)
- 2017 Fehlings: revisión 3 estudios:
  - MP si ≤ 8 horas; 24 horas
- 2019 Liu: metanálisis 16 estudios
  - MP no aconsejada
- 2020 Sultán: metanálisis 12 estudios
  - MP no aconsejada

Evolução

- 2002: AANCS: PM se ≤ 8 horas a partir do início da lesão
- 2013: AANCS: Não use devido a efeitos colaterais (sem novas evidências)
- 2017: Fehlings: revisão de 3 estudos:
  - MP se ≤ 8 horas; 24 horas
- 2019 Liu: metanálise 16 estudos
  - MP não recomendado
- 2020 Sultan: meta-análise 12 estudos
  - MP não recomendado

American Association of Neurological Surgeons (AANS)

- Otani K, Abe H, Kadoya S, Nakagawa H, Ikata T, Tominaga S. Beneficial effect of methylprednisolone sodium succinate in the treatment of acute spinal cord injury. Sekitsui Sekizui J. 1994;7:633-647.

- Pointillart V, Petitjean ME, Wiart L, et al. Pharmacological therapy of spinal cord injury during the acute phase. Spinal Cord. 2000;38:71-76.

- Evaniew N, Noonan V, Fallah N, et al. Methylprednisolone for the treatment of patients with acute spinal cord injuries: a propensity score-matched cohort study from a Canadian multicenter spinal cord injury registry. J Neurotrauma. 2015;32:1674-1683. doi:10.1089/neu.2015.3963

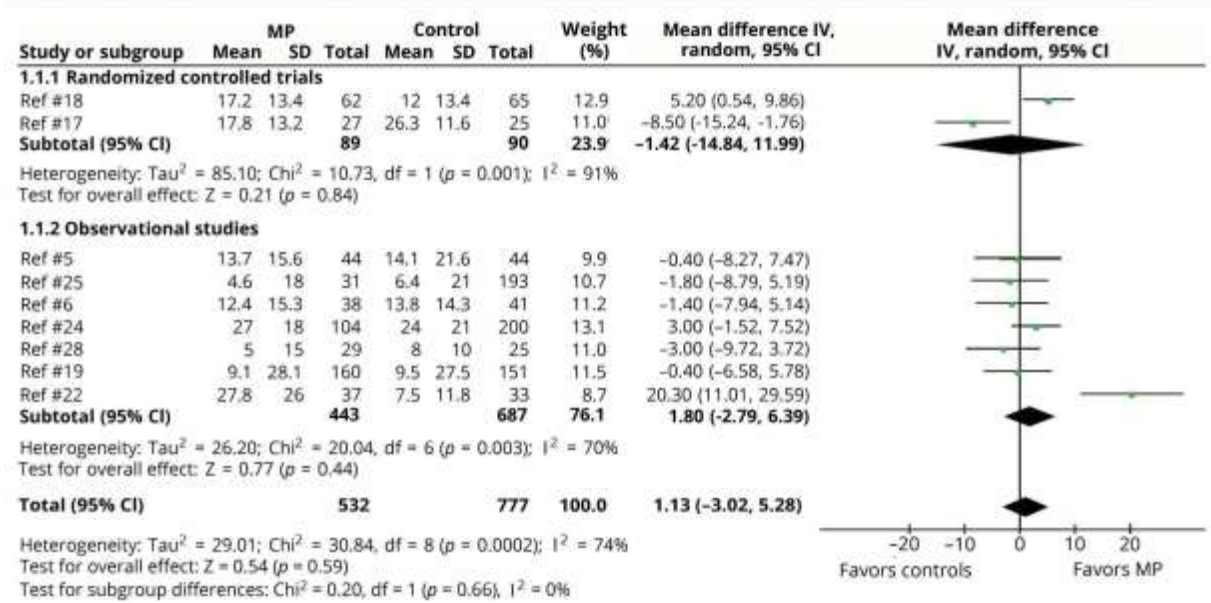
High-dose methylprednisolone for acute traumatic spinal cord injury

A meta-analysis

Zhongyu Liu, MD,* Yang Yang, MD,* Lei He, MD,* Mao Pang, MD, Chunxiao Luo, MD, Bin Liu, MD, PhD, and Limin Rong, MD, PhD

Neurology® 2019;93:1-10. doi:10.1212/WNL.0000000000007998

Motor score improvement in methylprednisolone (MP) vs control groups



Liu, Zhongyu, et al. "High-dose methylprednisolone for acute traumatic spinal cord injury: A meta-analysis." *Neurology* 93.9 (2019): e841-e850.

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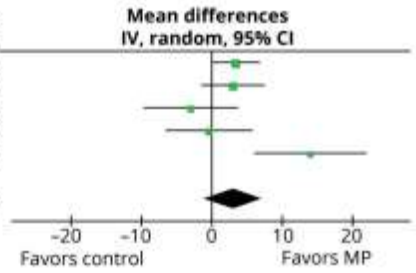
Motor score improvement in methylprednisolone (MP) vs control groups at short-term and long-term follow-ups

A

Study or subgroup	MP Mean	MP SD	MP Total	Control Mean	Control SD	Control Total	Weight (%)	Mean differences IV, random, 95% CI
Ref #3	10.6	10.2	66	7.2	10.3	70	26.2	3.40 (-0.05, 6.85)
Ref #24	27	18	104	24	21	200	23.2	3.00 (-1.52, 7.52)
Ref #28	5	15	29	8	10	25	17.4	-3.00 (-9.72, 3.72)
Ref #19	9.1	28.1	160	9.5	27.5	151	18.7	-0.40 (-6.58, 5.78)
Ref #22	20	21.6	37	6	11.4	33	14.6	14.00 (6.03, 21.97)
Total (95% CI)			**396**			**479**	**100.0**	**3.04 (-1.10, 7.17)**

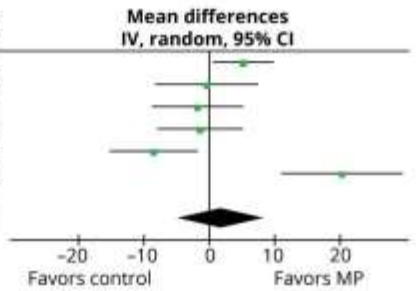
Heterogeneity: $Tau^2 = 13.92$; $Chi^2 = 11.58$, df = 4 ($p = 0.02$); $I^2 = 65\%$
Test for overall effect: z = 1.44 ($p = 0.15$)



B

Study or subgroup	MP Mean	MP SD	MP Total	Control Mean	Control SD	Control Total	Weight (%)	Mean differences IV, random, 95% CI
Ref #18	17.2	13.4	62	12	13.4	65	18.7	5.20 (0.54,9.86)
Ref #5	13.7	15.6	44	14.1	21.6	44	15.9	-0.40 (-8.27, 7.47)
Ref #25	4.6	18	31	6.4	21	193	16.7	-1.80 (-8.79, 5.19)
Ref #6	12.4	15.3	38	13.8	14.3	41	17.1	-1.40 (-7.94, 5.14)
Ref #17	17.8	13.2	27	26.3	11.6	25	16.9	-8.50 (-15.24, -1.76)
Ref #22	27.8	26	37	7.5	11.8	33	14.6	20.30 (11.01, 29.59)
Total (95% CI)			**239**			**401**	**100.0**	**1.89 (-4.70, 8.48)**

Heterogeneity: $Tau^2 = 54.85$; $Chi^2 = 28.42$, df = 5 ($p < 0.0001$); $I^2 = 82\%$
Test for overall effect: z = 0.56 ($p = 0.57$)



(A) Short-term and (B) long-term follow-ups. CI = confidence interval.

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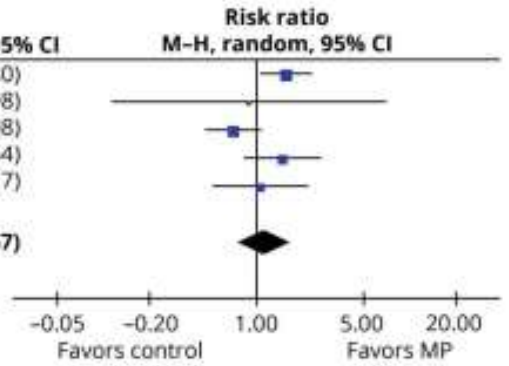
Incidence of at least 1 grade American Spinal Injury Association Impairment Scale/Frankel improvement in methylprednisolone (MP) vs control groups

Study or subgroup	MP Events	MP Total	Control Events	Control Total	Weight (%)	Risk ratio M-H, random, 95% CI
Ref #8	79	175	22	76	29.6	1.56 (1.06, 2.30)
Ref #25	1	31	7	193	3.3	0.89 (0.11,6.98)
Ref #6	17	38	26	41	28.0	0.71 (0.46, 1.08)
Ref #27	13	55	29	181	21.8	1.48 (0.83, 2.64)
Ref #21	19	59	7	23	17.3	1.06 (0.51, 2.17)
Total (95% CI)		**358**		**514**	**100.0**	**1.13 (0.77, 1.67)**

Heterogeneity: $Tau^2 = 0.10$; $Chi^2 = 8.52$, df = 4 ($p = 0.07$); $I^2 = 53\%$
Test for overall effect: z = 0.62 ($p = 0.3$)



CI = confidence interval; M-H = *Mantel-Haenszel*.

Liu, Zhongyu, et al. "High-dose methylprednisolone for acute traumatic spinal cord injury: A meta-analysis." *Neurology* 93.9 (2019): e841-e850.

Mejoría neurológica

Melhora neurológica

Heliyon 6 (2020) e03414

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Review article

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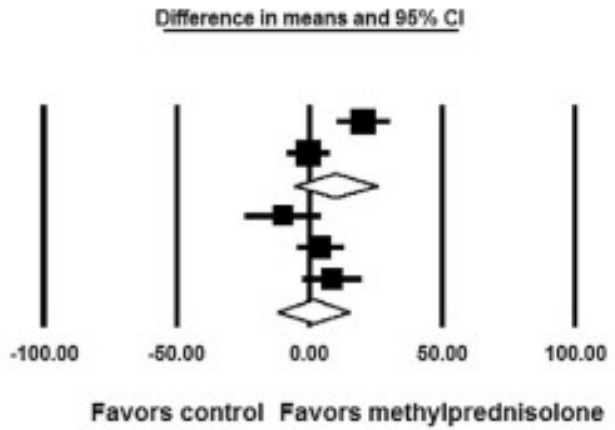
Ihtisham Sultan [a,1], Nayan Lamba [b,c,1], Aaron Liew [c], Phoung Doung [a], Ishaan Tewarie [c], James J. Amamoo [a,1], Laxmi Gannu [a], Shreya Chawla [c], Joanne Doucette [a], Christian D. Cerecedo-Lopez [c,1], Stefania Papatheodorou [d], Ian Tafel [c], Linda S. Aglio [c,f], Timothy R. Smith [c], Hasan Zaidi [c,2], Rania A. Mekary [a,c,d,*,2]

Model	Group by Study design	Study name	Follow-up	Statistics for each study		
				Difference in means	Lower limit	Upper limit
	OBS	Tsutsumi S, 2006	6 months	20.30	10.64	29.96
	OBS	Evaniew N, 2015	3.5 months	-0.40	-8.27	7.47
Random	OBS			9.62	-5.92	25.15
	RCT	Pointillart V, 2000	12 months	-10.00	-23.96	3.96
	RCT	Costa DD, 2015	3 months	4.00	-4.58	12.58
	RCT	Wang W, 2019	1 month	8.50	-2.60	19.60
Random	RCT			1.38	-11.94	14.69



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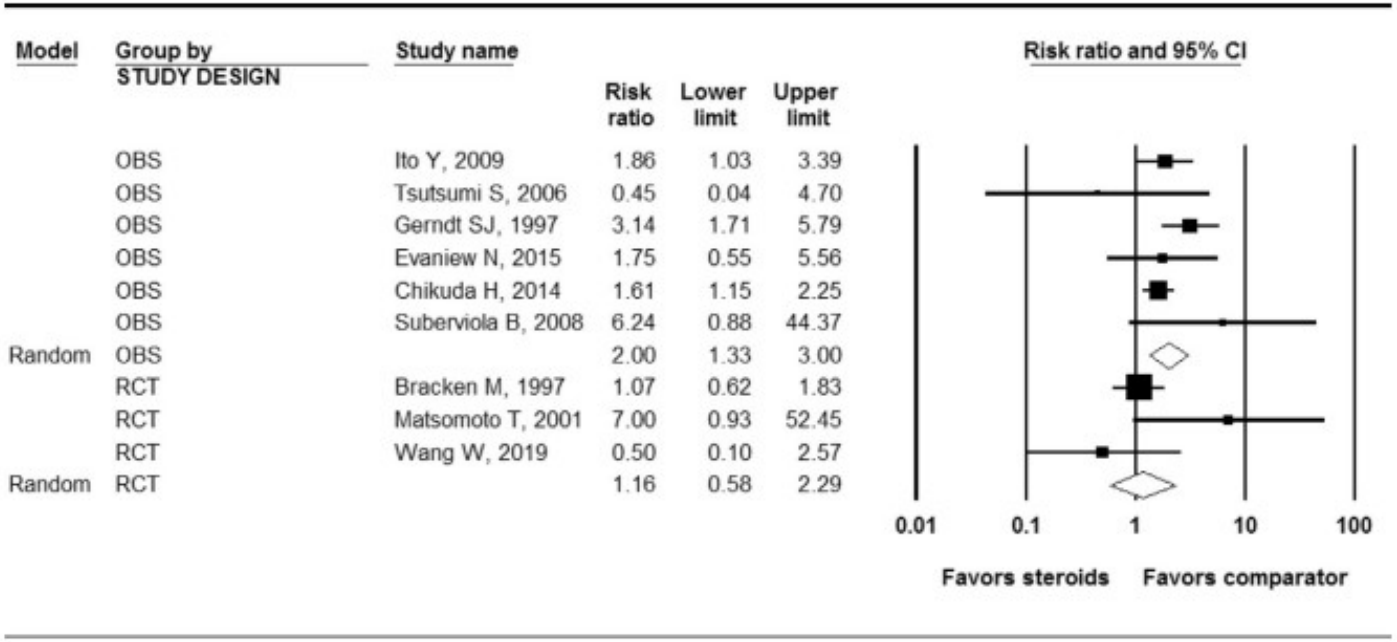

Neumonía

Pneumonia

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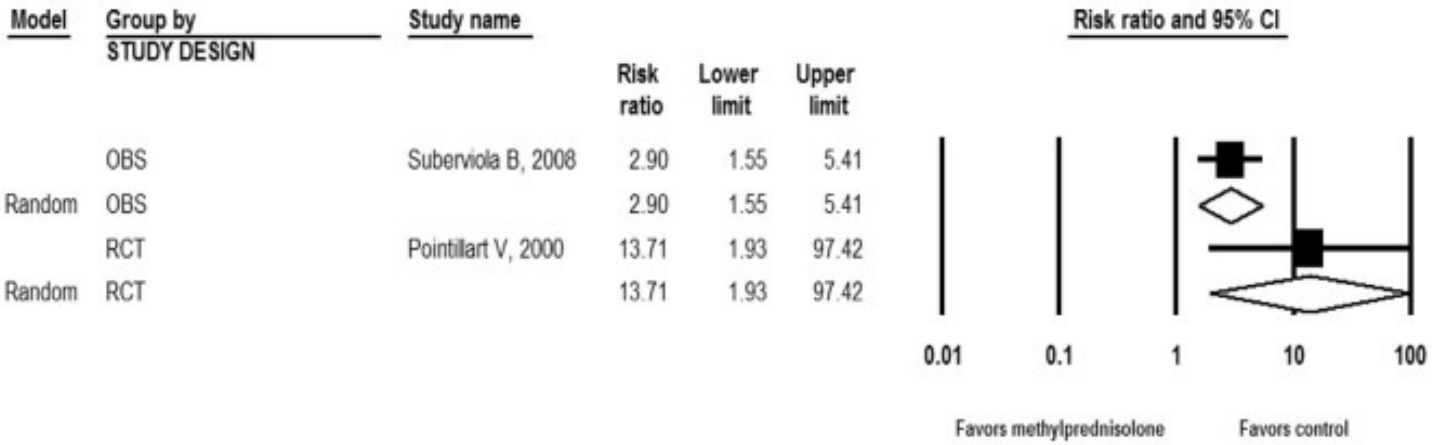

Hiperglucemia

Hiperglicemia

Sultan, Ihtisham, et al. "The safety and efficacy of steroid treatment for acute spinal cord injury: A Systematic Review and meta-analysis." *Heliyon* 6.2 (2020): e03414.

Clinical Neurorestorative Therapeutic Guidelines for Spinal Cord Injury International Association of Neurorestoratology and The Chinese Association of Neurorestoratology (IANR/CANR version 2019)

La MP todavía se puede utilizar en el caso de lesiones medulares cervicales incompletas, especialmente en pacientes con mielopatía por espondilitis cervical que requiere descompresión.

O MP ainda pode ser usado no caso de lesões cervicais medulares incompletas, especialmente em pacientes com espondilite cervical mielopatia que requer descompressão.

Huang, Hongyun, et al. "Clinical neurorestorative therapeutic guidelines for spinal cord injury (IANR/CANR version 2019)." *Journal of orthopaedic translation* 20 (2020): 14-24.

AOSpine North America (AOSNA), AOSpine International, the Cervical Spine Research Society (CSRS)

Sugerimos que *se ofrezca* una infusión de 24 horas de MP en dosis altas a pacientes adultos dentro de las 8 horas posteriores a la LME aguda como una opción de tratamiento.

Sugerimos *no ofrecer* una infusión de 24 horas de MP en dosis altas a pacientes adultos que se presenten después de 8 horas con LME aguda.

Sugerimos *no ofrecer* una infusión de 48 horas de MP en dosis altas a pacientes adultos con LME aguda.

Sugerimos que uma infusão de 24 horas de MPSS em alta dose seja oferecida a pacientes adultos dentro de 8 horas de lesão medular aguda como opção de tratamento.

Sugerimos *não oferecer* uma infusão de 24 horas de MPSS em alta dose para pacientes adultos que se apresentam após 8 horas com lesão medular aguda.

Sugerimos *não oferecer* uma infusão de 48 horas de MPSS em alta dose para pacientes adultos com lesão medular aguda.

Fehlings, Michael G., et al. "A clinical practice guideline for the management of acute spinal cord injury: introduction, rationale, and scope." (2017): 84S-94S.

Review Article

AOSPINE

Global Spine Journal
2018, Vol. 8(3) 303-310
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DOI: 10.1177/2192568217735804
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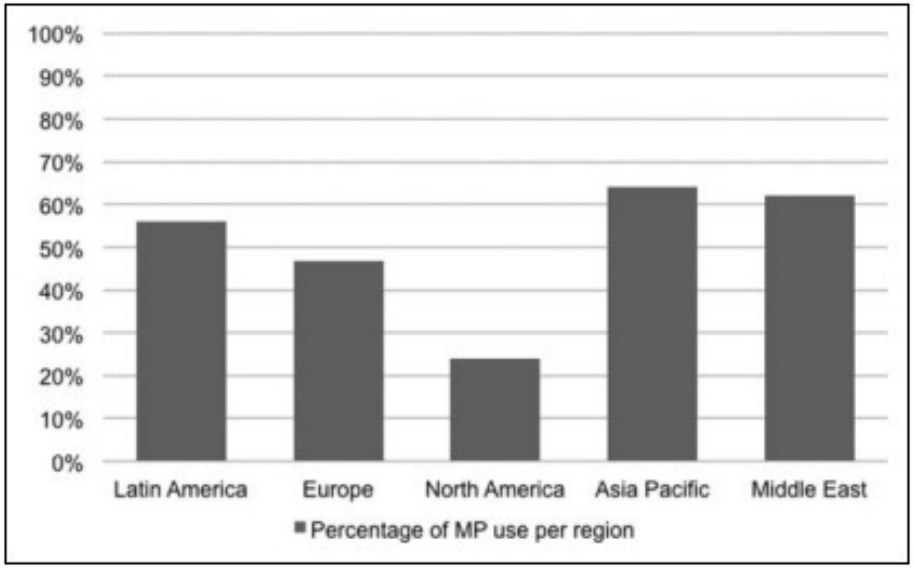
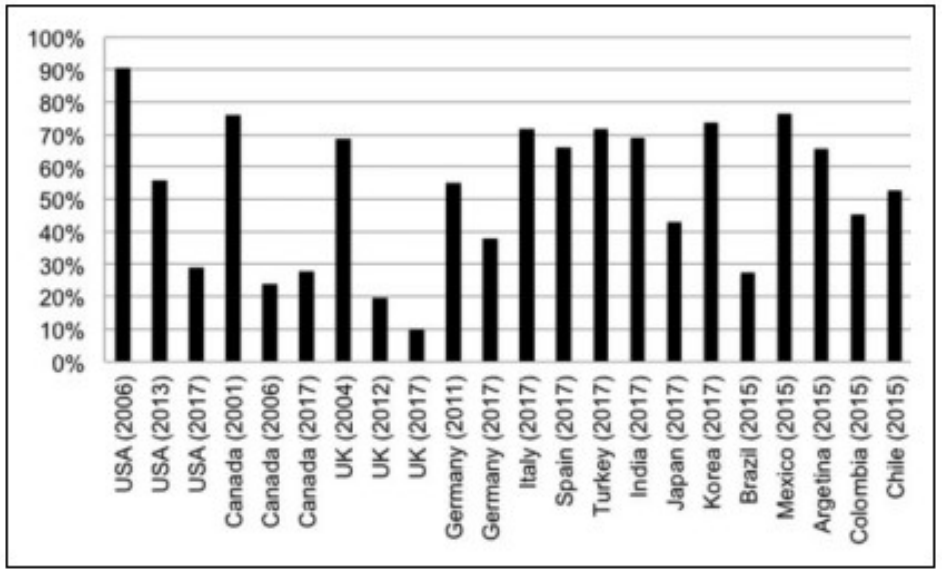
Worldwide Steroid Prescription for Acute Spinal Cord Injury

Asdrubal Falavigna, MD, PhD[1], Francine W. Quadros[1],





Falavigna, Asdrubal, et al. "Worldwide steroid prescription for acute spinal cord injury." *Global spine journal* 8.3 (2018): 303-310.

Conclusiones

- Sin consensos en los protocolos
- No hay datos concluyentes
- Se usan mucho
- Efectos limitados
- Excluidos como una recomendación estándar de atención

Conclusões

- Sem consenso sobre protocolos
- Sem dados conclusivos
- Eles são muito usados
- Efeitos limitados
- Excluído como uma recomendação padrão de atendimento

Dúvidas?

Contato:

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