Čo nás naučili štúdie CRASH

Štefan Trenkler
1. klinika AIM UNLP a UPJŠ LF Košice

- Nemám potenciálny konflikt záujmov

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

NIHR | National Institute for Health Research

UKRI Medical Research Council

1999 - 2019

MRC CRASH
Corticosteroid Randomisation After Significant Head Injury

CRASH 2
Clinical Randomisation of an Antifibrinolytic in Significant Haemorrhage

CRASH
Clinical Randomisation of an Antifibrinolytic in Significant Head Injury

Výskum ... Vzdelávanie ... Globálne zdravie
Etos spolupráce ... Translácia výskumu

Improving health worldwid

its research,

studies and continuing education in public and global health.

LSHTM has an international presence and collaborative ethos. It is uniquely placed to help shape health policy and translate research findings into tangible impact.

MRC CRASH
Corticosteroid Randomisation After Significant Head Injury

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

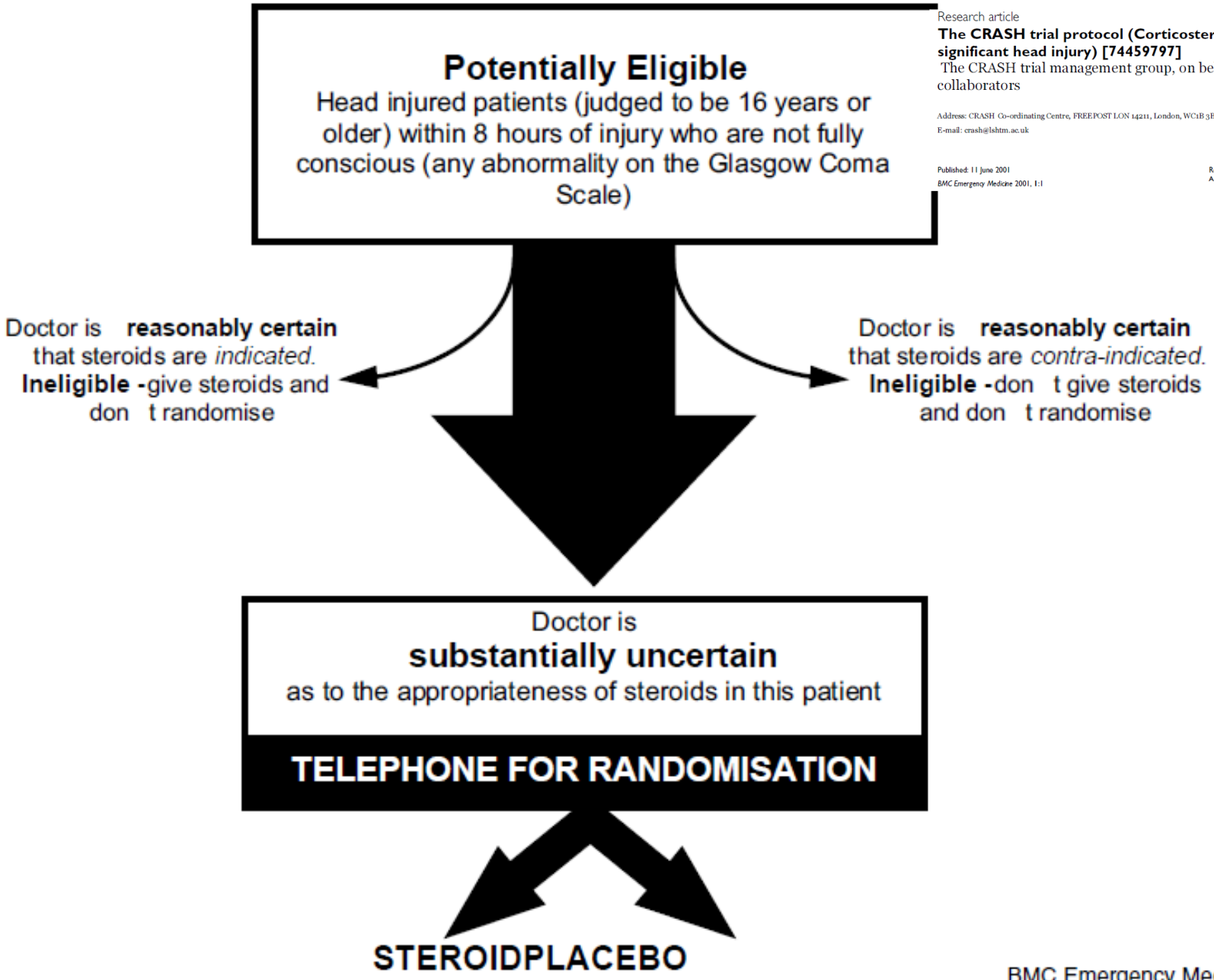
- 1999 - 2004
- RCT: metylprednizolón verzus placebo
- Preukázať 2% rozdiel v mortalite
- Recruit thousands (20 000) - Keep it simple
- Protokol publikovaný v Lancet – transparentnosť
- Zaradení:
  - dospelí, trauma mozgu, GCS ≤ 14; do 8 hodín
- Jednotná dávka: MP 2 g bolus
  + 48 hod infúzia 0,4 g/hod
- Výsledok: úmrtie / prepustenie / 2 týždne + 6 mesiacov
- Komplikácie: krvácanie z GIT, infekcia

Ako na to

MRC CRASH
Corticosteroid Randomisation After Significant Head Injury

UKRI Medical Research Council

- Financované Medical Research Council
- Desiatky centier na celom svete; lekári + sestry
- Dobrovoľníctvo, nadšenie, komunita
- 24 /7 call centrum; web stránka
- Národný / nemocničný koordinátor
- Spätná väzba (stretnutia, buletín...)
- Jednoduchosť
  - žiadne testy navyše
  - tri protokoly po 1 strane
    - zaradenie / 2 týždne / 6 mesiacov



Research article

The CRASH trial protocol (Corticosteroid randomisation after significant head injury) [74459797]

The CRASH trial management group, on behalf of the CRASH trial collaborators

Address: CRASH Co-ordinating Centre, FREEPOST LON 14211, London, WC1B 3BR, UK.
E-mail: crash@lshtm.ac.uk

Published: 11 June 2001
BMC Emergency Medicine 2001, 1:1

Received: 16 March 2001
Accepted: 11 June 2001

CRASH PATIENT ENTRY

INFORMATION REQUIRED FOR PAPER RANDOMISATION

Entry Date: / / Entry Time: :

[1] Country

[2] Name of hospital where patient entered
or give your hospital code

[3] Name of caller

[4] Patient **sex** Male Female

[5] Do you know patient's **name**? Yes No — if No, go to [8]

[6] Family name: _____ [7] Given name(s): _____

[8] Patient Hospital Identification Number (if name unknown):

[9] Do you know patient's **date of birth**? Yes No — if No, go to [11]

[10] Date of birth: / / — or, if not known: [11] Approximate age: _____

[12] Estimated number of hours since injury:

Current Glasgow Coma Scale: three questions will be asked — one or more replies must indicate an abnormality (if unable to assess, e.g. due to intubation, give most recent GCS)

[13] Eye opening:		[14] Motor response:		[15] Verbal response:	
Spontaneous	4	Obeys commands	6	Orientated	5
To sound	3	Localising	5	Confused speech	4
To pain	2	Normal flexion	4	Words	3
None	1	Abnormal flexion	3	Sounds	2
		Extending	2	None	1
		None	1		

[16] This GCS is: **1** Current **2** Most recent

Pupil reactiveness

[17] Left **1** Yes **2** No **3** Unable to assess

[18] Right **1** Yes **2** No **3** Unable to assess

Treatment Pack used: ☐☐ **Box:** ☐☐☐☐

Now fax this form to: +44 20 7299 4663

This form need not be kept as source documentation

MOISTEN EDGES AND SEAL TOGETHER

CRASH EARLY OUTCOME FORM

Complete at **discharge, death in hospital, or 14 days after injury** whichever occurs first
Please **PRINT** clearly and answer **EVERY** question

Attach treatment pack label here

1. Hospital name

2. Patient details or attach a label with these details (for 6-month follow-up)

Family name: Patient identification no. (if appropriate)

Given name(s): NHS number (if appropriate)

Sex: M F Date of Birth: / / (day/month/year)

Address:

Postcode: Telephone:

3. Cause of injury: Road traffic accident Fall > 2 metres Other:

4. Outcome (please complete questions **a,b,c** and **d**)

a. Death in hospital | Transferred to other acute care hospital | Discharged to rehabilitation centre or nursing home | Discharged home | Still in this hospital now

b. Date of death, transfer or discharge: / /

c. If transferred give consultant name/department, and name of hospital

d. Tick ✓ **one box** that best describes the patient's **head injury-related symptoms now** (i.e. at 14 days or prior discharge):
No symptoms | Minor symptoms | Some restriction in lifestyle but independent | Dependent, but not requiring constant attention | Fully dependent, requiring attention day and night | Dead

5. Management and complications
(please tick ✓ **ONE** box on **EACH** line)

Yes	No	
		Admitted to Intensive Care Unit If **Yes**, please write number of days in ICU
		Seizure
		Haematemesis or melaena requiring transfusion
		Wound infection with pus
		Pneumonia treated with antibiotics
		Other treatment with antibiotics
		Neurosurgical operation
		Major extracranial injury

6. Head CT scan Yes No If No go t

Date of first head CT scan: / / Time (24 hr clock)

Result: (please ✓ tick all that apply)

Obliteration of the 3rd ventricle or basal cisterns | One or more p haemorrhages the brain

Midline shift >5mm | Cortical contus > 1cm in diame

Intracranial haematoma – *evacuated* | Subarachnoid

Intracranial haematoma – *non-evacuated* | Normal scan

7. Trial treatment a) Loading dose: Yes No b) Hours of maintenance dose:

Sections 8 and 9 are only required if the patient is alive

8. Reliable contact (Next of kin or friend)

Name:
Address:
Post code:
Tel:

9. Family doctor

Name:
Address:
Post code:
Tel:

10. Person completing form (please PRINT):

Name: Position: Date:

When complete fold form as indicated, stick together and post to:
CRASH Co-ordinating Centre, FREEPOST, LON14211, London WC1N 1BR OR FAX +44 (0)20 72

MOISTEN EDGES AND SEAL TOGETHER

OLD

Keep it simple

INTERNATIONAL STUDY OF RECOVERY AFTER HEAD INJURY

These questions are about changes in your lifestyle since your injury. They can be answered by you, a relative or friend, or by you both together. If you have any questions about this form, please contact Senior Nurse Nin Ritchie on 020 7299 4742. Please answer each question below by ticking one box ☑ which is true for you.

Your answers will help us improve the care of people following a head injury.

Please say who filled out this form:
Patient alone | Relative, friend or carer alone | Patient and relative, friend or carer together

1. At present, where do you live most of the time?
In own home | In hospital | In residential care

2. As a result of your injury, do you now need help in the home?
No | Yes. I need some help in the home, but not every day. | Yes. I need help in the home every day. | I need help in the home, but not because of the injury.

3. As a result of your injury, do you now need help to shop?
No | Yes. I need some help, but can go to the local shops on my own. | Yes. I need help to shop even locally, or cannot shop at all. | I need help to shop, but not because of the injury.

4. As a result of your injury, do you now need help to travel?
No | Yes. I need some help, but can travel locally on my own (e.g. by arranging a taxi). | Yes. I need help to travel even locally, or I cannot travel at all. | I need help to travel, but not because of the injury.

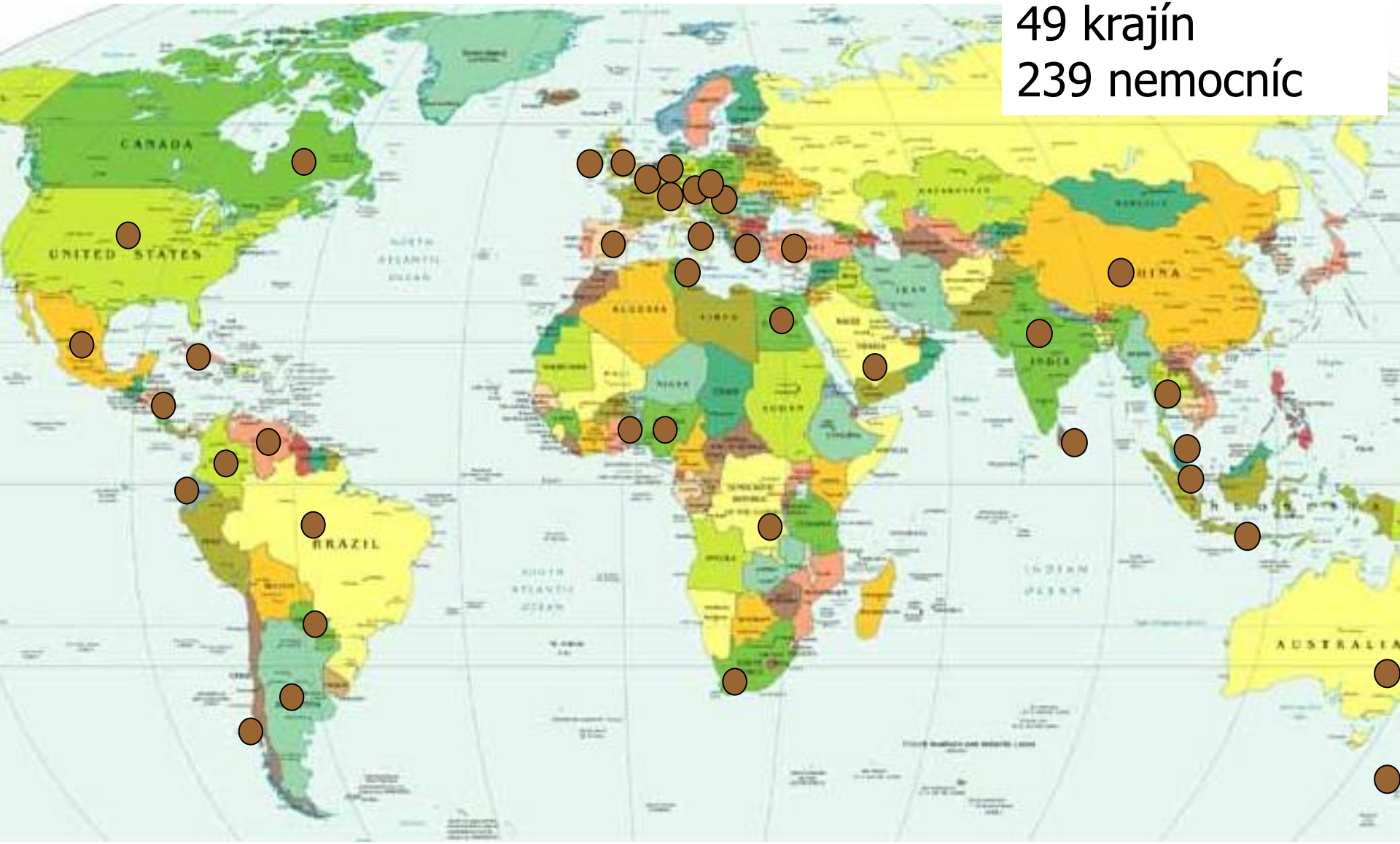
5. As a result of your injury, has there been a change in your ability to work? (or to study if you were a student; or to look after your family)
No | Yes. I still work, but at a reduced level (e.g. a change from full-time to part-time, or a change in level of responsibility). | Yes. I am unable to work at present. | My ability to work is restricted, but not because of the injury, or I have retired.

6. As a result of your injury, has there been a change in your ability to take part in social and leisure activities outside home?
No | Yes. I take part a bit less, but at least half as often. | Yes. I take part much less, or do not take part at all. | My ability to take part is restricted for some other reason, not because of the injury.

7. As a result of your injury, are there now problems in how you get on with friends or relatives?
No | Yes. There are occasional problems (less than once a week). | Yes. There are frequent or constant problems. | There are problems for some other reason, not because of the injury.

Thank you for your help. Please return this form in the envelope provided to: Dr Ian Roberts, International Study of Recovery after Head Injury, LSHTM, University of London, 49-51 Bedford Square, London WC1B 3DP.

1999 - 2004
10 008 pacientov
49 krajín
239 nemocníc



Masaryk Hospital
24/04/2000

Hospital
Kralovske
Vinohgrady
25/05/2002

Charles University
Hospital
15/03/2002

Hospital Pribram
26/02/2000

Univerzita Karlova
Neurochirurgicka
Klinika
02/10/2000

University Hospital
Hradec Kralove
16/06/2001

Research Institute for Special Surgery and Trauma

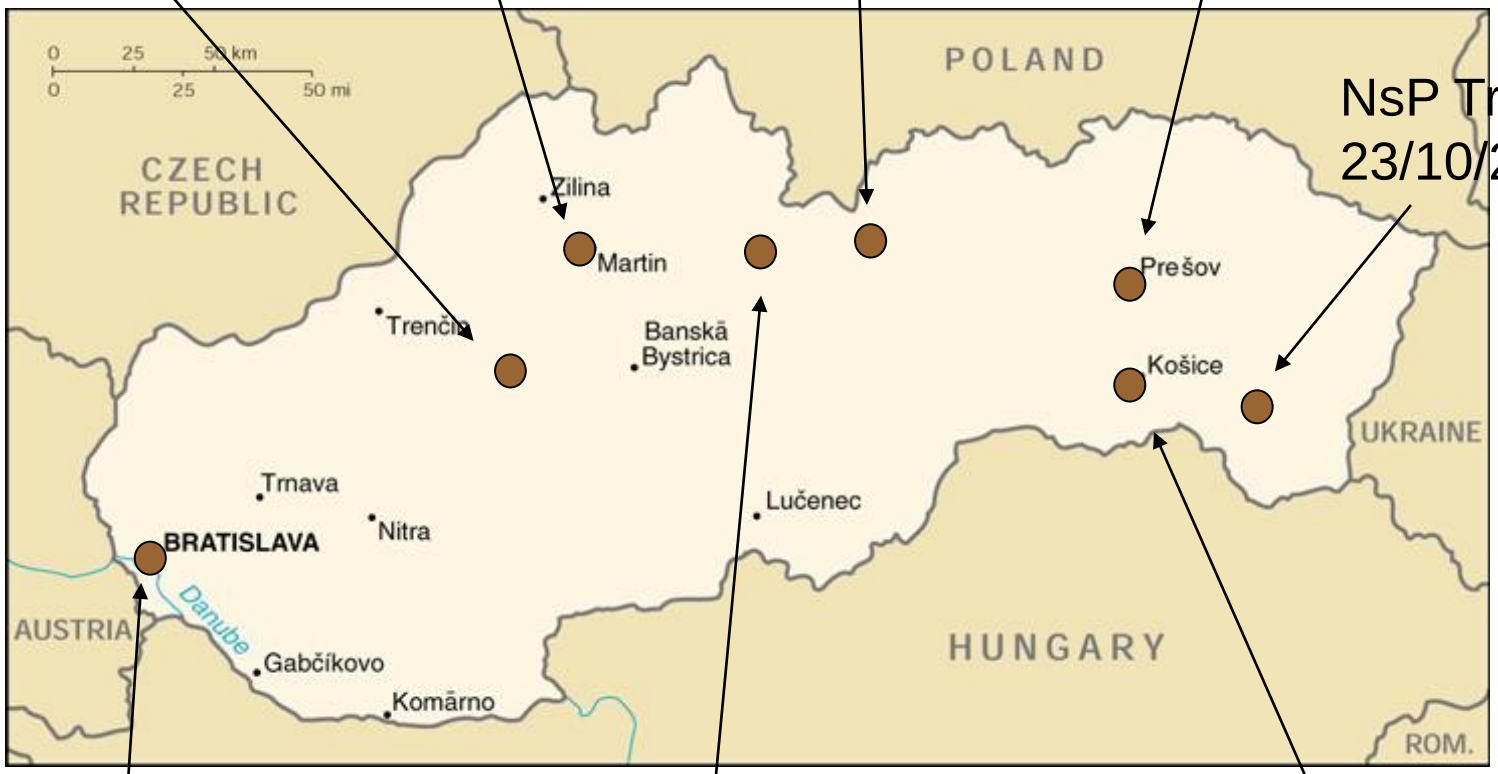
started on
16/04/1999

NsP Bojnice
14/03/2002

FNsP Martin
18/07/2002

NsP Poprad
28/01/2002

Reimann Hospital
started
18/08/1999



NsP Trebisov
23/10/2002

NsP Ruzinov
25/07/2002

NsP Liptovsky Mikulas
12/11/2002

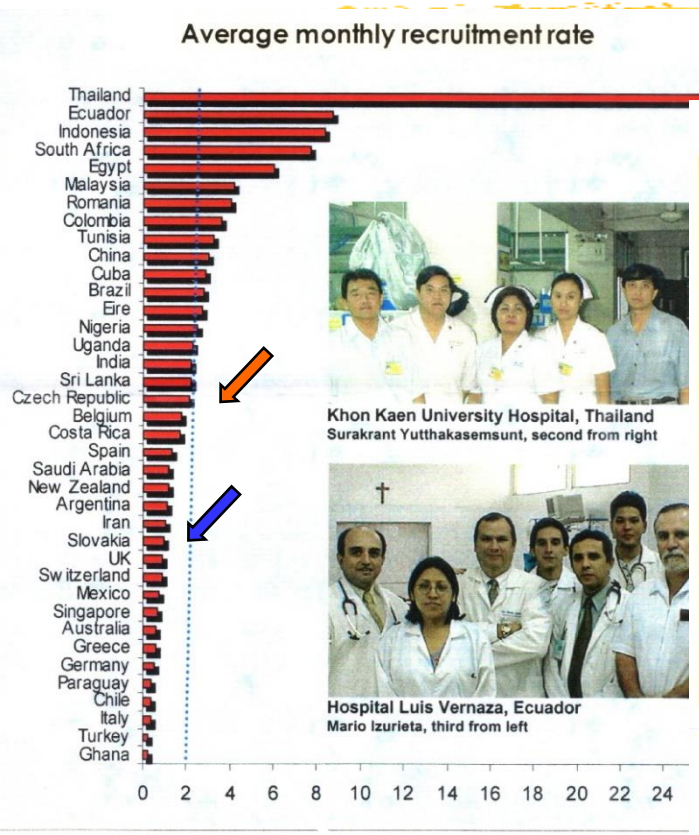
FNsP Kosice
16/04/2002

1 140 pacientov
11,4 %

Slovakia (179)—Reiman Hospital (71): Štefan Trenkler NC, Matuš Humenansky, Tatiana Stajančová; NsP Poprad (39): Ivan Schwendt, Anton Laincz; Nemocnica Bojnice (25): Zeman Julius, Stano Maros; FNsP Kosice (12): Jozef Firment; NsP Trebisov (11): Maria Cifraničova; Faculty Hospital in Martin (10): Beata Sániová; NsP Ruzinov (4): Karol Kalig; NsP Nové Zámky (3): Soňa Medekova; NsP Liptovsky Mikulas (2): Radovan Wiszt; NsP F D Roosevelt (1); NsP Zilina (1): Ivan Mačuga.

Czech Republic (961)—Research Institute for Special Surgery and Trauma (852): Petr Svoboda NC, Ilona Kantorová, Jiří Ochmann, Peter Scheer, Ladislav Kozumplík, Jitka Maršová; Masaryk Hospital (41): Karel Edelmann; Charles University Hospital, Plzen (35): Ivan Chytra, Roman Bosman; University Hospital Hradec Kralove (15): Hana Andrejsová; Hospital Kralovske Vinohgrady (9): Jan Pachl; Hospital Pribram (7): Jan Bürger; Univerzity Karlovy Neurochirurgicka Klinika (2): Filip Kramar.

Bulletin CRASH 2003



Khon Kaen University Hospital, Thailand
Surakrant Yutthakasemsunt, second from right

Hospital Luis Vernaza, Ecuador
Mario Izurieta, third from left

Mentions – Thank you all!

New ethics approvals

Wang Maode and Guo Shiwen, Xi'an Jiaotong University 1st Hospital, China
Wei Shi and Liu Chongxiao, Xi'an Jiaotong University 2nd Hospital, China
Roberto Gomez Piñedo, Hospital Timothy Britton (first patient), Colombia
Edgar Luna, Hospital Departamental de Pasto, Colombia
Jesus Quiñones, Hospital San Andrés (first patient), Colombia
Gladys Rivas-Caniño, Hospital Miguel Enriquez, Cuba
Roberto Santos, Hospital Regional del IESS "Dr. Teodoro Maldonado Carbo", Ecuador
Mario Piños Gavilanes, Hospital Alcivar, Ecuador
Jaime Velasquez Tapia, Hospital Naval, Ecuador
Tamara Gogichaishvili, Republican Hospital, Georgia
Wu Hoong Chhang, North Bengal Neuro Research Centre, India
A Satish, Abhaya Hospital, India
Ehsan Sherafat Kazemzadeh, Social Security Hospital (first patient) and Fatemeh Zahra Hospital, Iran
Vittorio Vitalone, S Filippo Neri, Italy
Edward O Komolafe, Obafemi Awolowo University Teaching Hospitals (10 patients'), Nigeria
Jose Edmundo Mezquita, Complejo Hospitalario M. A. Guerrero, Panama
David Foley, Queen Mary's Hospital, United Kingdom
Branco Djurovic, Klinicki Centar Srbije, Yugoslavia

1st patient

Marcos Iraola Ferrer, Hospital Universitario "Dr Gustavo Aldereguia Lima", Cuba
Mario A Domínguez Perera, Hospital Universitario "Arnaldo Milián Castro", Cuba
Antonios Karavelis, University General Hospital of Larissa, Greece
K S Maheshwari, Maheshwari Orthopaedic Hospital, India
Manas Panigrahi, Nizam's Institute of Medical Sciences, India
Adam Danil and Remus Iliescu, Sfantum Pantelimon Hospital, Romania
Charles Seah, Changi General Hospital, Singapore
Maria Cifranicova, NsP Trebisov, Slovakia
Radovan Wiszt, NsP Liptovsky Mikulas, Slovakia
Alfonso Muñoz López, Hospital Carlos Haya, Spain
Titus Odedun, Ormskirk And District General Hospital, United Kingdom

10 pts

Walter Videtta, Hospital Dr Ramón Carillo, Argentina

Ivan Chytra, Charles University Hospital, Plzen, Czech Republic

50 pts

Ignacio Gonzalez and Miguel Fernando Arango, Hospital General de Medellin, Colombia

Alvaro Ardila Otero, Hospital Universitario San Jorge, Colombia

Nyoman Golden, Sanglah General Hospital, Indonesia

Stefan Trenkler, Reimann Hospital, Slovakia

Surakrant Yutthakasemsunt, Khon Kaen Regional Hospital, Thailand – **50 pts in the first seven weeks**

200 pts

Bennie Hartzenberg, Tygerberg Academic Hospital, South Africa

Effect of intravenous corticosteroids on death within 14 days in 10008 adults with clinically significant head injury (MRC CRASH trial): randomised placebo-controlled trial

*CRASH trial collaborators**

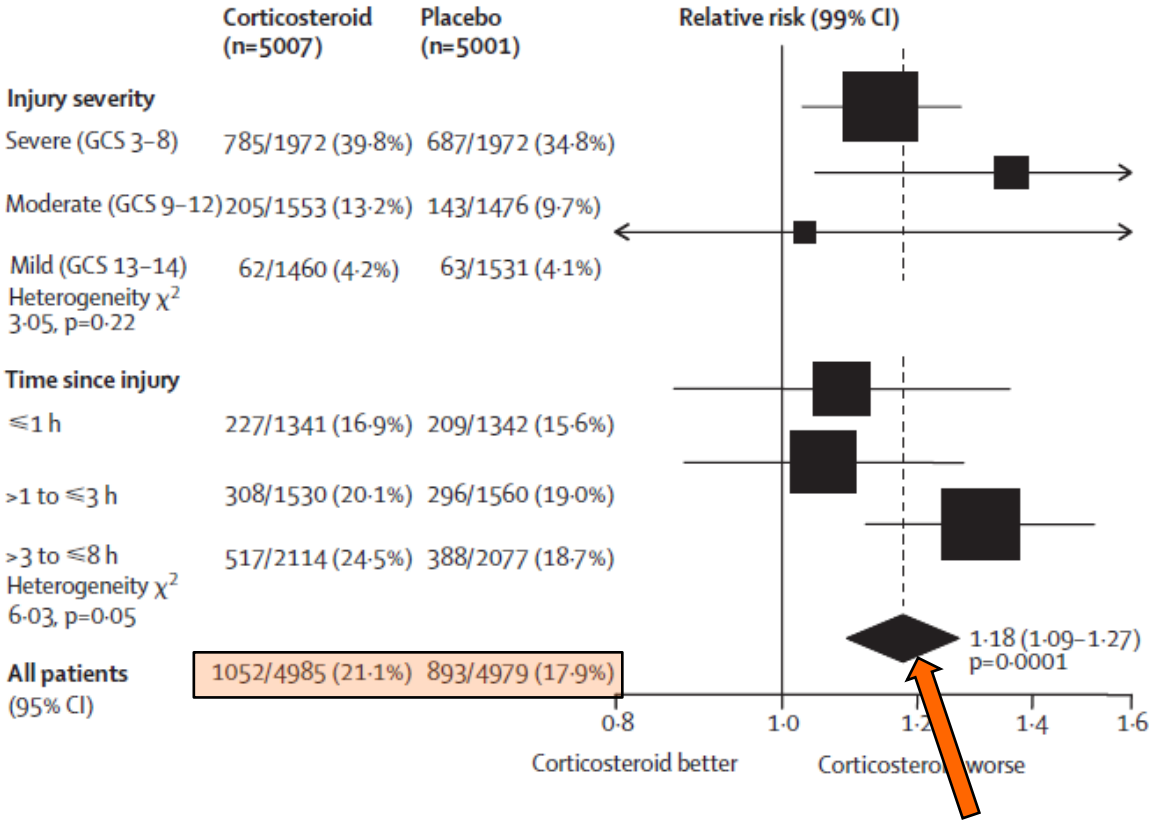
Lancet 2004; 364: 1321–28

See **Comment** page 1291

*Listed at end of report

Summary

Počet pacientov: 10 008
Predčasné ukončenie
Výsledné údaje: 99 %
Mortalita: 21,1 / 17,9 %
MP: úmrtie ⇧ 3,2 %
Nie: GCS, čas

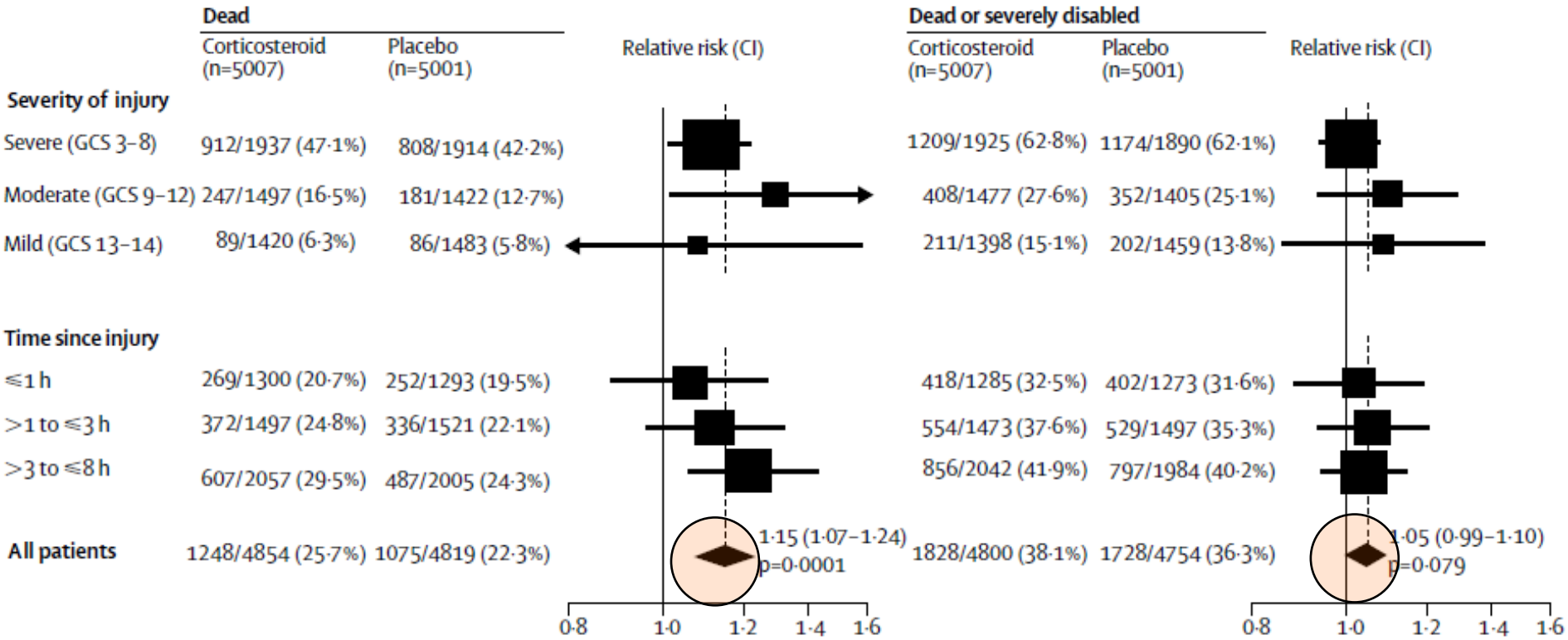


Final results of MRC CRASH, a randomised placebo-controlled trial of intravenous corticosteroid in adults with head injury—outcomes at 6 months

*CRASH trial collaborators**

MRC CRASH is a randomised controlled trial (ISRCTN74459797) of the effect of corticosteroids on death and

Lancet 2005; 365: 1957–59



Final results of MRC CRASH, a randomised placebo-controlled trial of intravenous corticosteroid in adults with head injury—outcomes at 6 months

*CRASH trial collaborators**

MRC CRASH is a randomised controlled trial (ISRCTN74459797) of the effect of corticosteroids on death and disability after head injury. We randomly allocated 10 008 adults with head injury and a Glasgow Coma Scale score of 14 or less, within 8 h of injury, to a 48-h infusion of corticosteroid (methylprednisolone) or placebo. Data at 6 months were obtained for 9673 (96·7%) patients. The risk of death was higher in the corticosteroid group than in the placebo group (1248 [25·7%] *vs* 1075 [22·3%] deaths; relative risk 1·15, 95% CI 1·07–1·24; p=0·0001), as was the risk of death or severe disability (1828 [38·1%] *vs* 1728 [36·3%] dead or severely disabled; 1·05, 0·99–1·10; p=0·079). There was no evidence that the effect of corticosteroids differed by injury severity or time since injury. These results lend support to our earlier conclusion that corticosteroids should not be used routinely in the treatment of head injury.

Published online
May 26, 2005
DOI:10.1016/S0140-6736(05)66552-X

*See end of paper.

Correspondence to: CRASH Trials Co-ordinating Centre, London School of Hygiene and Tropical Medicine, Keppel St, London WC1E 7HT, UK
crash@lshtm.ac.uk

Brain Trauma FOUNDATION

Guidelines for the Management of Severe Traumatic Brain Injury

4th Edition 2016

RECOMMENDATIONS

Level I

- The use of steroids is not recommended for improving outcome or reducing ICP. In patients with severe TBI, high-dose methylprednisolone was associated with increased mortality and is contraindicated.

Changes from Prior Edition

The body of evidence was updated to include the 6-month outcomes of the CRASH trial.[14] There were no changes to the recommendations for this topic.

www.braintrauma.org

Prednemocničná neodkladná starostlivosť o pacientov s neurotraumou

Odporúčaný postup SSUMaMK

Členovia komisie: MUDr. Monika Paulíková (predseda), MUDr. Štefan Trenkler, PhD., MUDr. Katarína Brštiaková, MUDr. Miloslav Hanula, PhD., MUDr. Kamil Koleják, PhD.

Posúdili: doc. MUDr. Viliam Dobiáš, CSc., MUDr. Táňa Bulíková, PhD., MUDr. Štefan Svitok.

Schválil výbor SSUMaMK ku dňu 9.1.2015.

Príloha 1. Indikátory kvality

1. Dýchacie cesty priechodné
2. Krčná chrbtica správne fixovaná
3. ETI v sedácii a relaxácii (rapid sequence induction)
4. $SpO_2 > 90$ %; $ETCO_2$ monitorované, udržiavané v rozmedzí 35 - 40 mmHg
5. TK monitorovaný, TKs > 110 mmHg (cievny prístup, infúzia, noradrenalín)
6. GCS opakovane vyhodnotené a zapísané
7. Neboli použité kortikosteroidy
8. Neurologický stav dokumentovaný
9. Glykémia vyšetrená
10. Dokumentácia úplná
11. Transportovaný/á do traumacentra
12. Čas do odovzdania v zdravotníckom zariadení do 60 minút.

Slovenská spoločnosť urgentnej medicíny a medicíny katastrof

Prednemocničná neodkladná starostlivosť o pacientov s neurotraumou

Odporúčaný postup SSUMaMK

2013 Odporúčanie pre nepodávanie MP u pacientov so spinálnou traumou prednemocnične

Štefan Trenkler, PhD.,
eják, PhD.

Posúdili: doc. MUDr. Viliam Dobiáš, CSc., MUDr. Táňa
JDr. Štefan Svitok.

Schválil výbor SSUMaMK ku dňu 9.1.2015.

Príloha 1. Indikátory kvality

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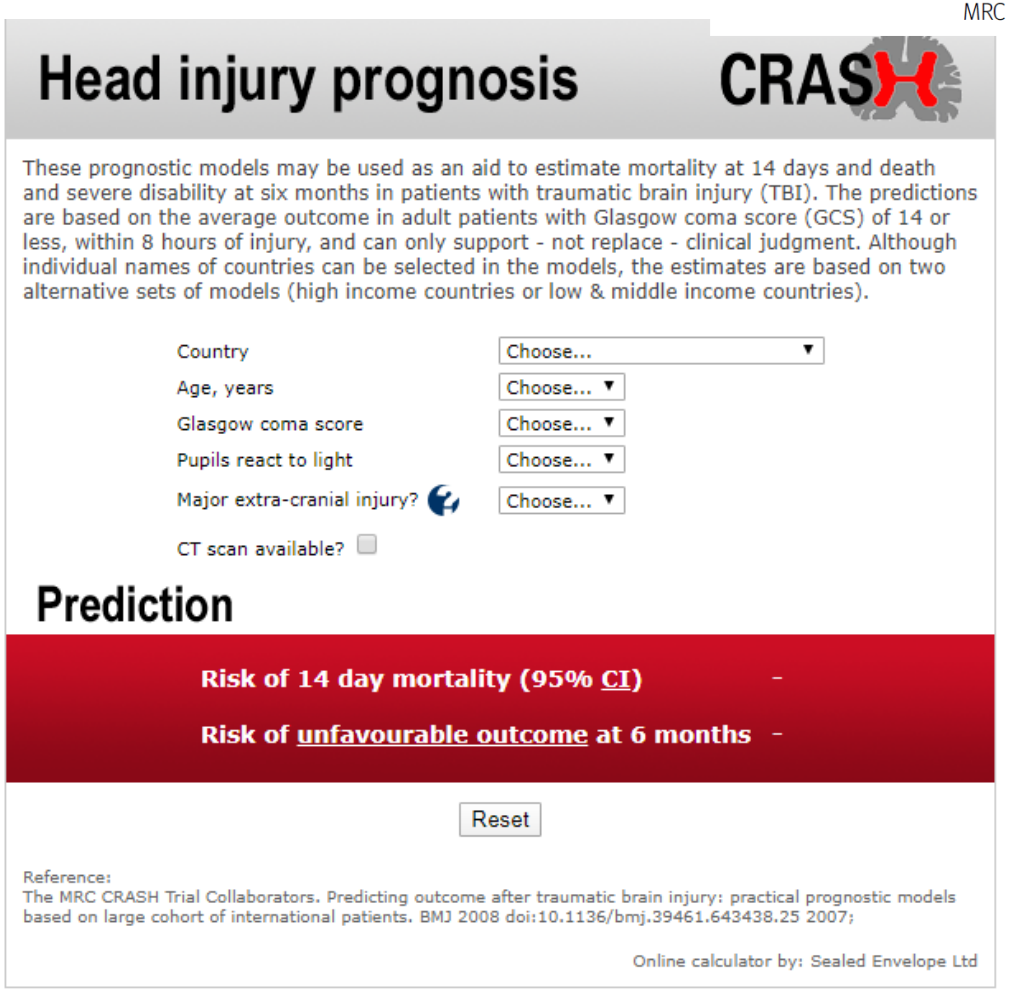
BMJ

RESEARCH

Predicting outcome after traumatic brain injury: practical prognostic models based on large cohort of international patients

MRC CRASH Trial Collaborators



Head injury prognosis

CRASH

These prognostic models may be used as an aid to estimate mortality at 14 days and death and severe disability at six months in patients with traumatic brain injury (TBI). The predictions are based on the average outcome in adult patients with Glasgow coma score (GCS) of 14 or less, within 8 hours of injury, and can only support - not replace - clinical judgment. Although individual names of countries can be selected in the models, the estimates are based on two alternative sets of models (high income countries or low & middle income countries).

Country: Choose...

Age, years: Choose...

Glasgow coma score: Choose...

Pupils react to light: Choose...

Major extra-cranial injury? Choose...

CT scan available?

Prediction

Risk of 14 day mortality (95% CI) -

Risk of unfavourable outcome at 6 months -

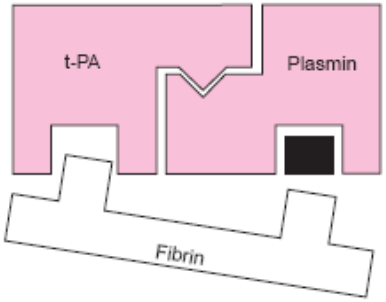
Reset

Reference:
The MRC CRASH Trial Collaborators. Predicting outcome after traumatic brain injury: practical prognostic models based on large cohort of international patients. BMJ 2008 doi:10.1136/bmj.39461.643438.25 2007;

Online calculator by: Sealed Envelope Ltd

CRASH-2
Clinical Randomisation of an Antifibrinolytic in Significant Haemorrhage

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE



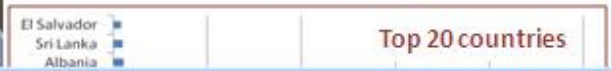
- 2005 - 2010
- Keep it simple, recruit many (20 000)
- RCT: kys. tranexánová vz. placebo; multicentrická
- Zaradení:
  - dospelí s traumatickým krvácaním/potenciálom, do 8 hodín
- Jednotná dávka:
  - TXA 1 g/10 minút i.v. + TXA 1 g/8 hod inf.
- Výsledok: úmrtie do 4 týždňov
- Trombembolické komplikácie
- Žiadne testy, jednoduché protokoly

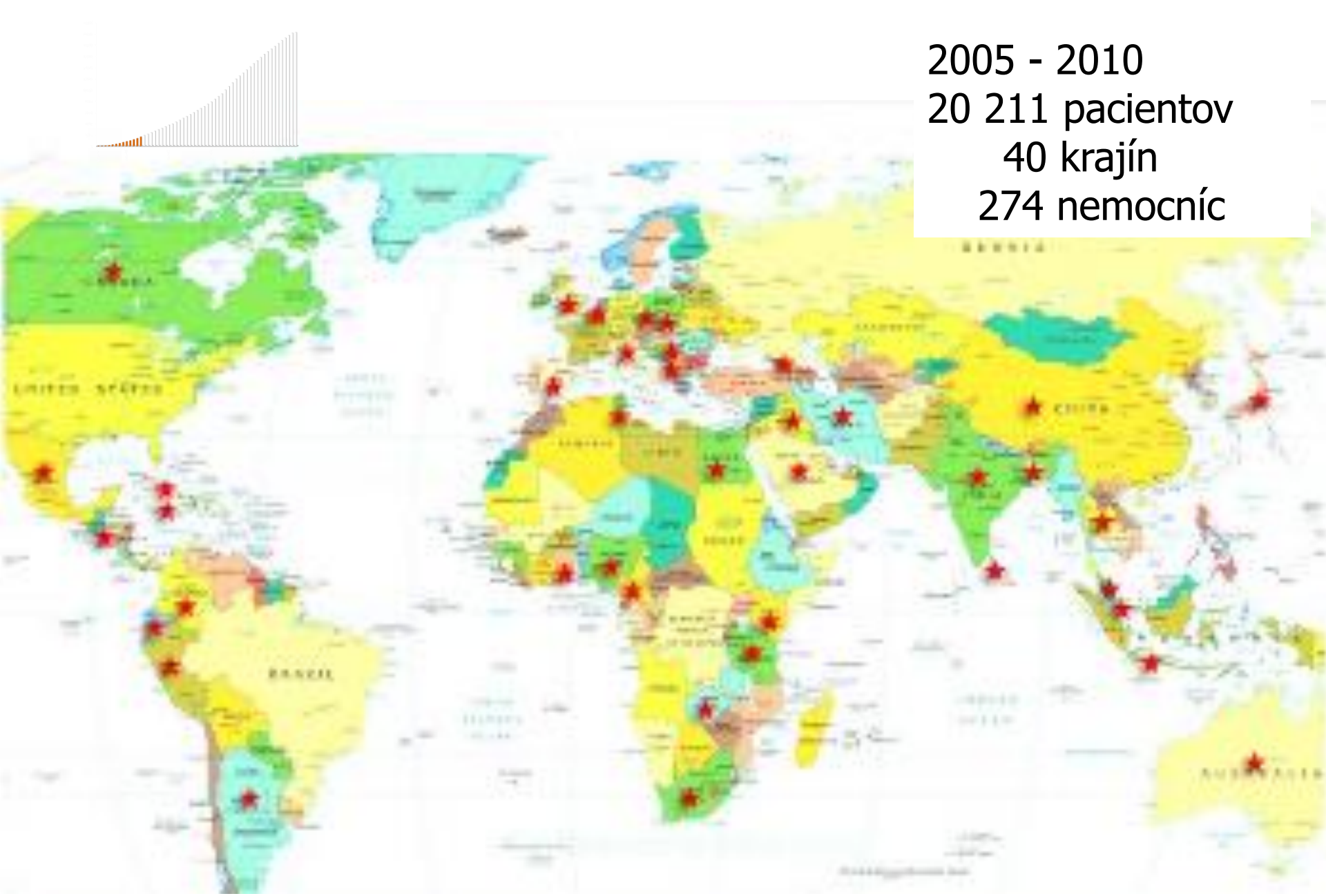
CRASH-2

Clinical Randomisation of an Antifibrinolytic in Significant Haemorrhage

20,211 patients randomised
99.6% follow-up
40 countries – 274 hospitals

Congratulations to all our collaborators around the world!




2005 - 2010
20 211 pacientov
40 krajín
274 nemocníc

Výsledky

Kolumbie	2 940	Austrálie	17
Kuba	575	Belgie	51
Ekvádor	1 198	Kanada	2
Egypt	2 234	Česká rep.	17
Gruzie	1 783	Itálie	57
Indie	4 768	Japonsko	9
Indonézie	706	Slovensko	38
Nigérie	2 053	Španělsko	23
Thajsko	903	UK	135
	17 160		349

20 211 pacientů z 274 nemocnic ve 40 zemích (ovšem >98% z rozvojových zemí)

CRASH-2

Clinical Randomisation of an Antifibrinolytic in Significant Haemorrhage

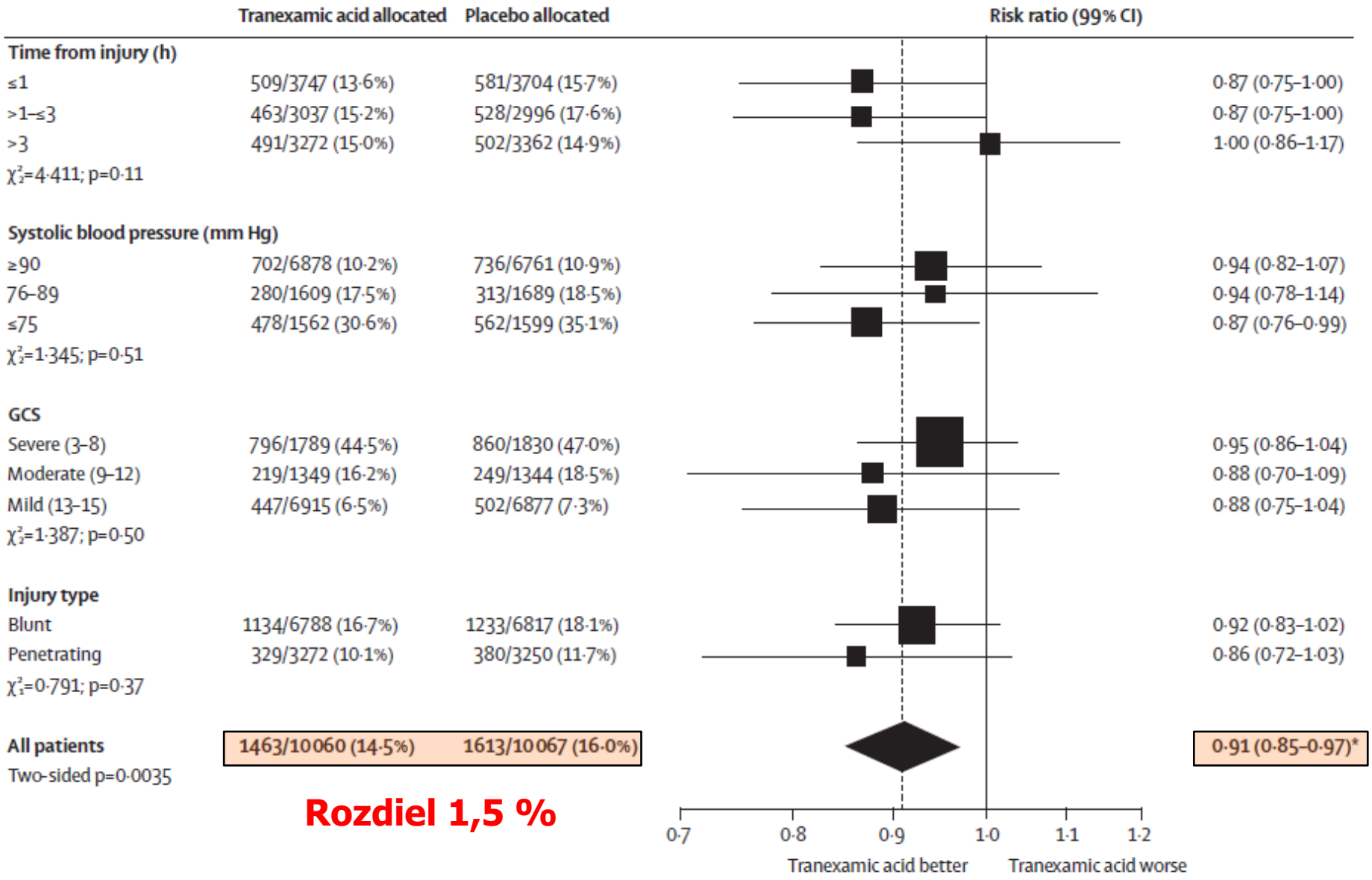
55 pacientov
0,27 %

Appendix 1 CRASH-2 trial organisation

Slovakia (38)—FNsP Ružinov: Aktham Yaghi; NsP Poprad: Anton Laincz; NsP JA Reiman Hospital: Stefan Trenkler; Faculty Hospital F D Roosevelta: Jozef Valky.

Czech Republic (17)—Research Institute for Special Surgery and Trauma: Petr Svoboda.

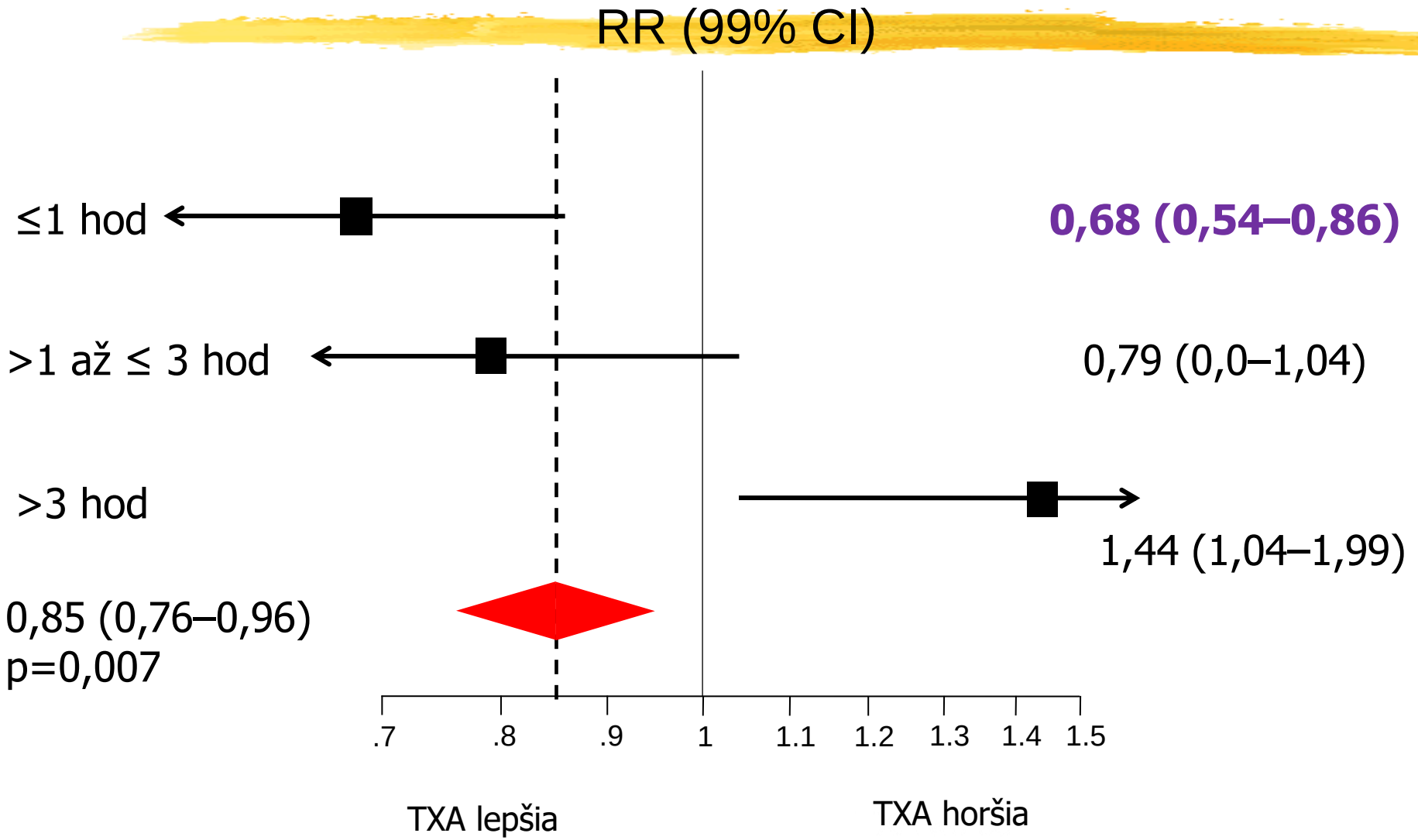
Celková mortalita



Rozdiel 1,5 %

Lancet 2010; 376: 23–32

CRASH-2: mortalita pre krvácanie



Lancet 2011; 377: 1096-101

Spahn et al. Critical Care (2019) 23:98
https://doi.org/10.1186/s13054-019-2347-3

Critical Care

RESEARCH Open Access

The European guideline on management of major bleeding and coagulopathy following trauma: fifth edition

Donat R. Spahn[1], Bertil Bouillon[2], Vladimir Cerny[3,4,5,6], Jacques Duranteau[7], Daniela Filipescu[8], Beverley J. Hunt[9], Radko Komadina[10], Marc Maegele[11], Giuseppe Nardi[12], Louis Riddez[13], Charles-Marc Samama[14], Jean-Louis Vincent[15] and Rolf Rossaint[16*]

TXA

1. Krvácanie/riziko
2. Čo najskôr/do 3 hod
3. 1 g bolus + 1 g počas 8 hod
4. Protokol, prednemocnične
5. Aj bez vyšetrení (TEG, ROTEM)

V. Initial management of bleeding and coagulopathy

Antifibrinolytic agents

Recommendation 22 We recommend that TXA be administered to the trauma patient who is bleeding or at risk of significant haemorrhage as soon as possible and within 3 h after injury at a loading dose of 1 g infused over 10 min, followed by an i.v. infusion of 1 g over 8 h. (Grade 1A)

We recommend that protocols for the management of bleeding patients consider administration of the first dose of TXA en route to the hospital. (Grade 1C)

We recommend that the administration of TXA not await results from a viscoelastic assessment. (Grade 1B)

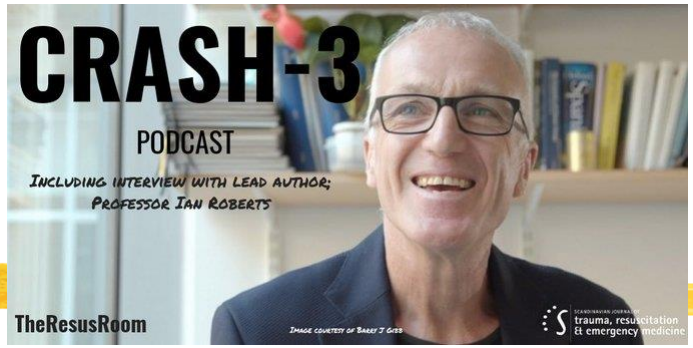
PŮVODNÍ PRÁCE

Vplyv kyseliny tranexámovej na mortalitu, cievne okluzívne príhody a transfúzie krvi u pacientov s veľkým poúrazovým krvácaním (CRASH-2) – randomizovaná, placebom kontrolovaná štúdia*

Trenkler Štefan[1], Laincz Anton[2], Valky Jozef[3], Yaghi Ajtham[4], Svoboda Petr[5] (za spolupracovníky CRASH-2 studie)**

[1]Klinika anestéziológie a intenzívnej medicíny, Univerzita P. J. Šafárika a Univerzitná nemocnica L. Pasteura Košice, Slovensko
[2]Oddelenie anestéziológie a intenzívnej medicíny, Nemocnica Poprad, a. s., Slovensko
[3]Oddelenie anestéziológie a intenzívnej medicíny, Fakultná nemocnica s Poliklinikou F. D. Roosevelta Banská Bystrica
[4]Klinika anestéziológie a intenzívnej medicíny, Univerzitná nemocnica Bratislava, Nemocnica Ružinov
[5]Úrazová nemocnice v Brně
**Další účastníci sú uvedení na konci článku

Implementácia



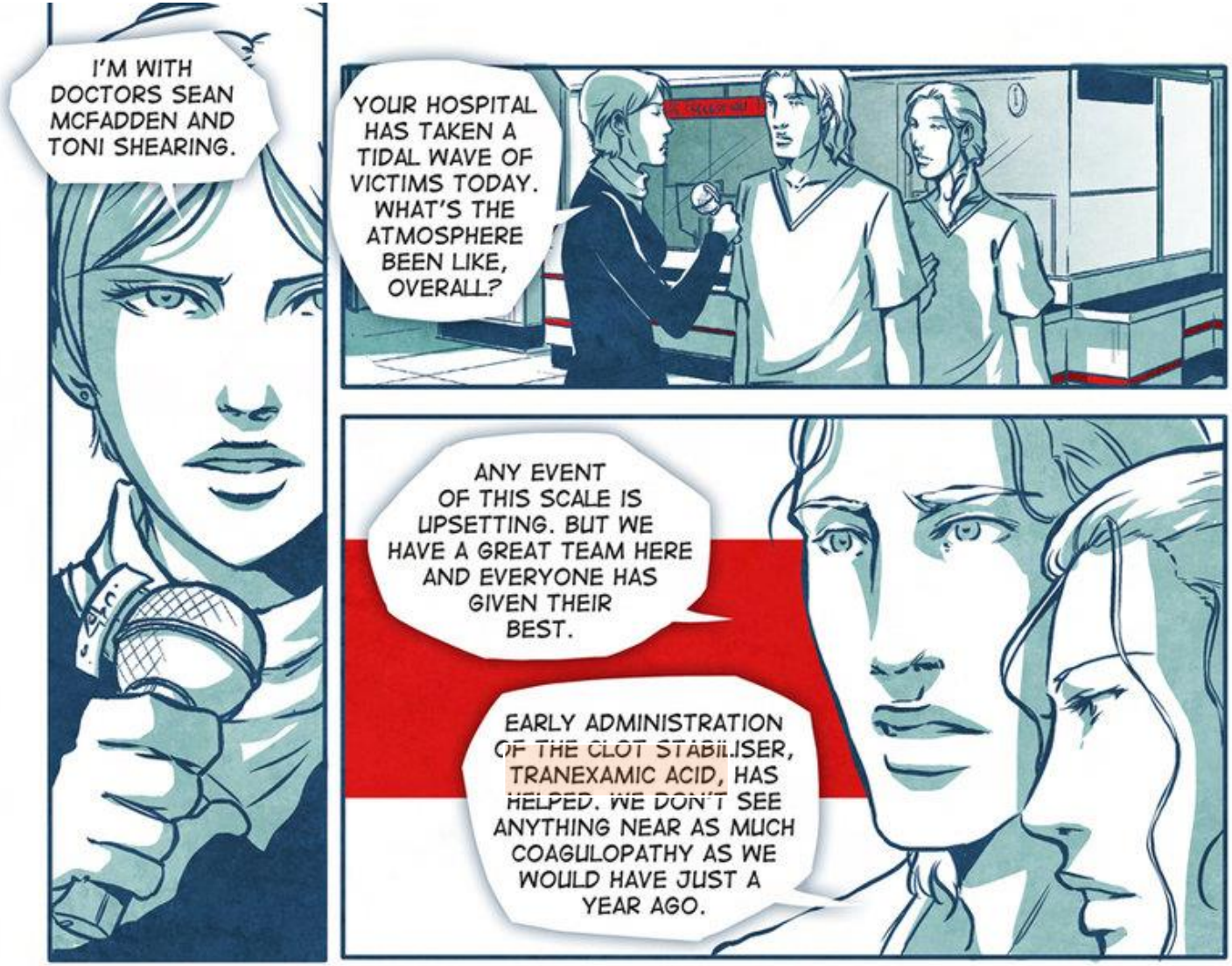
- Ian Roberts – implementácia: zapojiť umenie, emócie
- Video TranMan
- Hudba: skladba pre zbor „Doctor, give me TXA, save my life...“
- Knihy: Komiks
- WWW stránka
- Twitter
  - how CRASH 2 got it wrong/wright
- „FOAM“ (free access Meducation)
- Kampaň „Trauma promise“
- BBC, ABC, Holby City, WikEM ...
- „Klima, morálna povinnosť, sociálna spravodlivosť“

Barking and Dagenham Community Choir

https://www.youtube.com/watch?v=aGYG19krCa0

Komiks


TXA
Scenario: Dr Ian Roberts
Story & Art: Emma Viccell
Colour: Paul Duffield


I'M WITH DOCTORS SEAN MCFADDEN AND TONI SHEARING.
YOUR HOSPITAL HAS TAKEN A TIDAL WAVE OF VICTIMS TODAY. WHAT'S THE ATMOSPHERE BEEN LIKE, OVERALL?
ANY EVENT OF THIS SCALE IS UPSETTING. BUT WE HAVE A GREAT TEAM HERE AND EVERYONE HAS GIVEN THEIR BEST.
EARLY ADMINISTRATION OF THE CLOT STABILISER, TRANEXAMIC ACID, HAS HELPED. WE DON'T SEE ANYTHING NEAR AS MUCH COAGULOPATHY AS WE WOULD HAVE JUST A YEAR AGO.

That's not a peer-reviewed number, but it's in the ballpark. That's pretty exciting for something that's arguably safer than normal saline—and almost as cheap.

It may be time to start thinking of TXA as **"aspirin" for trauma**.

M.Bivens

Review Article

CRASH-2 Study of Tranexamic Acid to Treat Bleeding in Trauma Patients: A Controversy Fueled by Science and Social Media

Journal of Blood Transfusion
Volume 2015, Article ID 874920, 12 pages
http://dx.doi.org/10.1155/2015/874920

Sophia Binz,[1] Jonathon McCollester,[2] Scott Thomas,[3] Joseph Miller,[1] Timothy Pohlman,[4] Dan Waxman,[5] Faisal Shariff,[3,6] Rebecca Tracy,[3] and Mark Walsh[3,7]

- Subjektívne zaradenie
- Pokles mortality iba o 1,5 %
- Žiadny rozdiel v transfúziách
- Iba polovica dostala transfúziu, málo pacientov s hypotenziou
- Mechanizmus účinku?
- Žiadne laboratórne vyšetrenia
- 99% výsledky?
- Málo nežiaducich účinkov (0,4 % DVT, 0,7 % TE)
- Rozvojové krajiny

CRASH

Clinical Randomisation of an Antifibrinolytic in Significant Head Injury

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

- 2012 – 2019
- RCT: TXA verzus placebo
- Zaradení:
  - dospelí s izolovanou traumou mozgu; do 8 hodín
  - GCS ≤ 12, krvácanie na CT
- Jednotná dávka: TXA 1 g/10 min + 1 g/8 hodín
- Výsledok: úmrtie / prepustenie / 28 dní
  - invalidizácia, kŕče, DVT/PE, komplikácie
- Jednoduchý protokol

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

CRASH-3
Clinical Randomisation of an Antifibrinolytic in Significant Head Injury

10157 patients randomised

(last updated 13/10/2017)

Time since injury

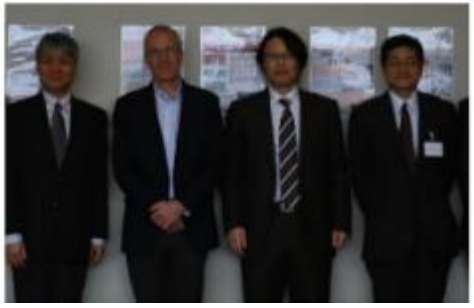
Read Post →

BREAKING NEWS

Read Post →

Time is Brain poem

Read Post →



Effects of tranexamic acid on death, disability, vascular occlusive events and other morbidities in patients with acute traumatic brain injury (CRASH-3): a randomised, placebo-controlled trial

*The CRASH-3 trial collaborators**

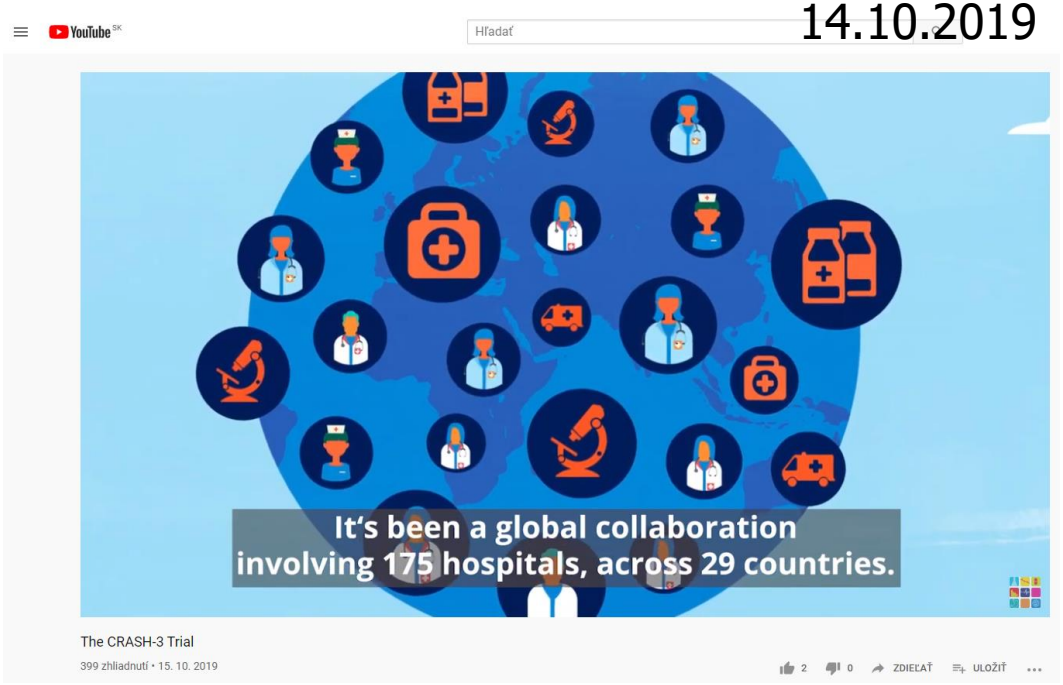
Summary

Background Tranexamic acid reduces surgical bleeding and decreases mortality in patients with traumatic extracranial bleeding. Intracranial bleeding is common after traumatic brain injury (TBI) and can cause brain herniation and death. We aimed to assess the effects of tranexamic acid in patients with TBI.

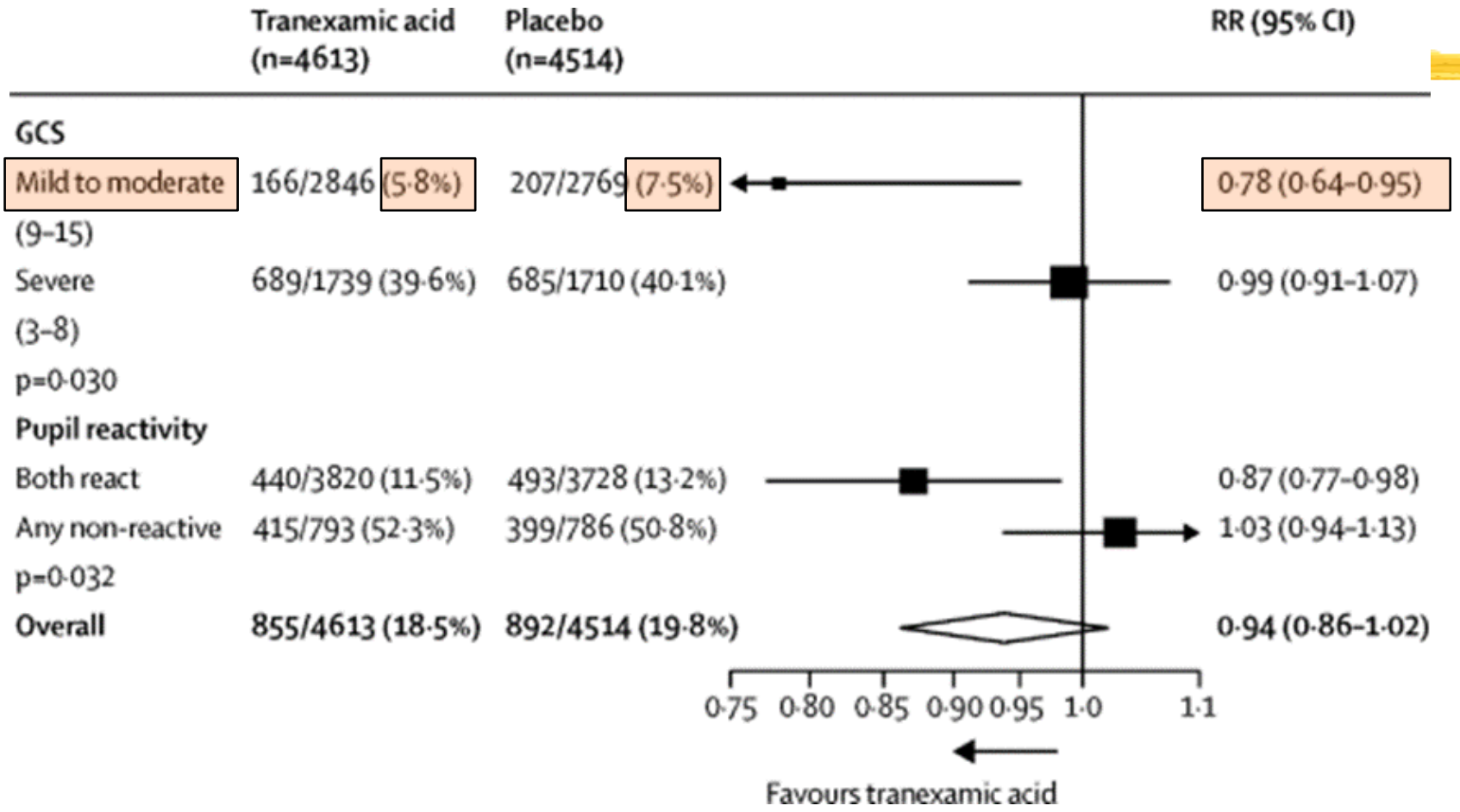
Published Online
October 14, 2019
https://doi.org/10.1016/
S0140-6736(19)32233-0

14.10.2019

- 2012 - 2019
- 12 737 pacientov
  29 krajín
  175 nemocníc
- **SK, CZ = 0**

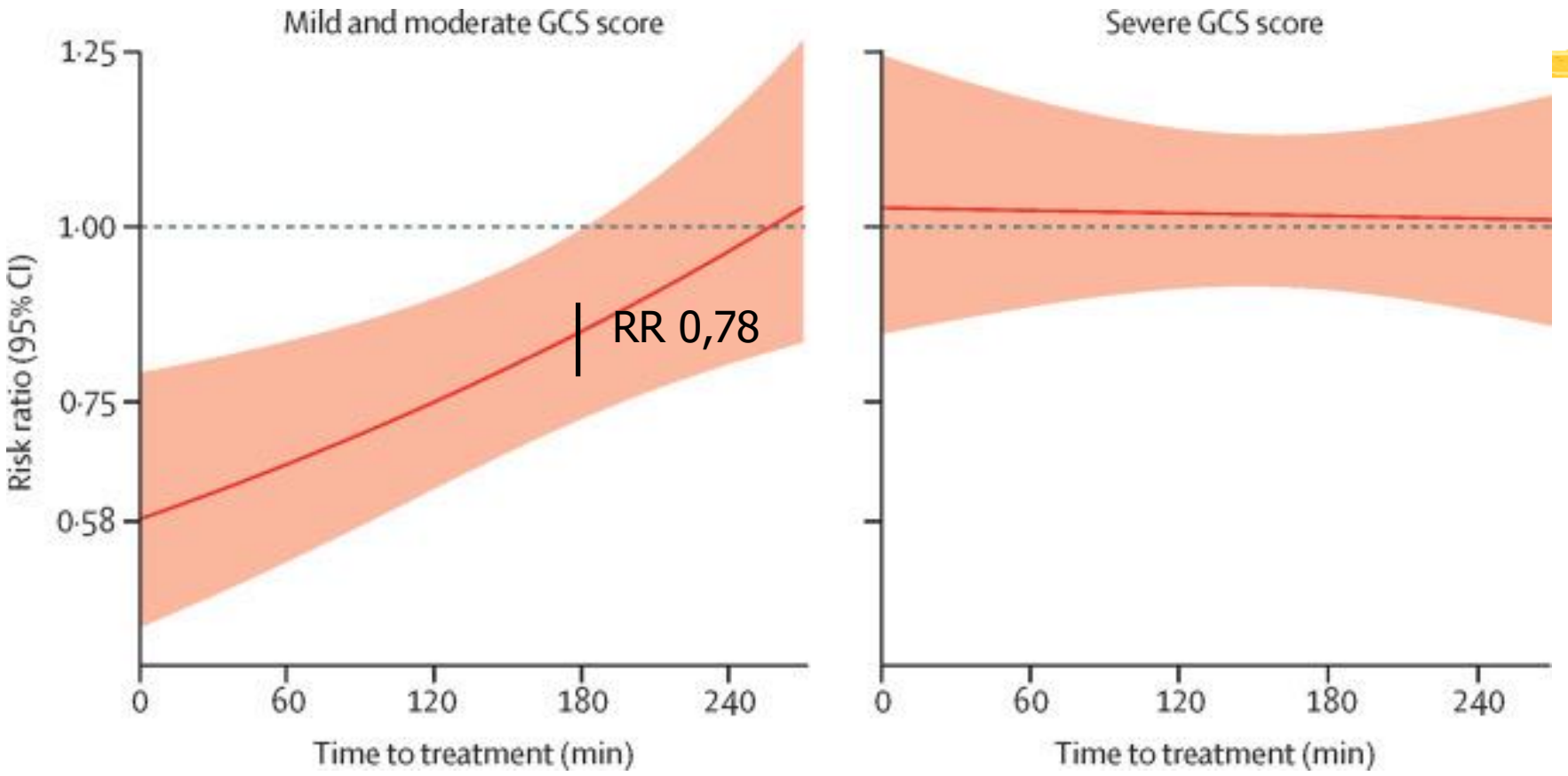


CRASH 3 mortalita pri podaní do 3 hodín



Celková mortalita nezmenená

Lancet 2019; 394: 1713–23



Lancet 2019; 394: 1713–23

Závery

CRASH
Clinical Randomisation of an Antifibrinolytic in Significant Head Injury

- Celková mortalita znížená nesignifikantne
- Signifikantný prínos:
  - GCS 9 - 12
  - podanie do 3 hod

  5,8 % vz. 7,5 %, RR 0,78 (0,64 - 0,95)
  NNT = 55
- Podanie je bezpečné
  - bez rozdielu DVT/PE
  - invalidizácia rovnaká
- Implementovať

Research in context

Evidence before this study

Evidence from the CRASH-2 trial that administration of tranexamic acid within 3 h of injury [illegible] with traumatic [illegible] and [illegible] ty

[illegible] search were published. We found two small randomised trials of tranexamic acid in traumatic brain injury with a total of 510 patients. Meta-analysis of the two trials showed a statistically significant reduction in death with tranexamic acid. However, given the small size of the trials, we considered this evidence to be hypothesis generating, requiring confirmation in larger randomised trials.

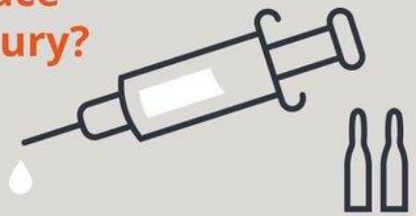
Added value of this study

Our study found that the risk of death from head injury was reduced in patients treated with tranexamic acid, particularly when patients [illegible] randomised [illegible] tranexamic acid in 967 patients with [illegible] brain injury. The dose of tranexamic acid was the same as in the CRASH-3 trial and patients with a GCS score of 3 and those with unreactive pupils at baseline were also excluded. When the two trials were pooled, we found a reduction in head injury-related death with tranexamic acid and no evidence of an increased risk in vascular occlusive events or seizures. Combining the results of all available randomised trials shows a reduction in head injury-related death in patients treated with tranexamic acid. Early administration of tranexamic acid should be considered in patients with traumatic brain injury.

events or seizures. Combining the results of all available randomised trials shows a reduction in head injury-related death in patients treated with tranexamic acid. Early administration of tranexamic acid should be considered in patients with traumatic brain injury.

Can tranexamic acid (TXA) reduce death from traumatic brain injury?

TXA is a drug that prevents bleeding by stopping blood clots from breaking down



CRASH 3 Trial

12,737	29	175
Patients	Countries	Hospitals

Results

TXA could save **1 in 5** people who would have died following a mild or moderate head injury

Time is vital - TXA is more effective the earlier it is given

Every **20 minute delay** leads to a **10%** reduction in effectiveness

TXA is **safe to give**, there's no evidence of side effects and no increase in disability

Štúdie CRASH 1, 2, 3

MRC CRASH
Corticosteroid Randomisation After Significant Head Injury

CRASH 2
Clinical Randomisation of an Antifibrinolytic in Significant Haemorrhage

CRASH 3
Clinical Randomisation of an Antifibrinolytic in Significant Head Injury

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

UKRI Medical Research Council

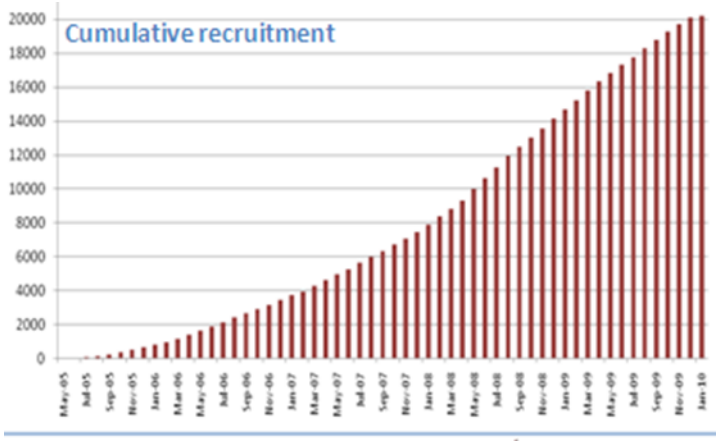
- Tri štúdie zmenili medicínsku prax
  - zmeny v odporúčaniach
  - TXA: WHO esenciálny liek
- London School of Hygiene – profesionáli
  (Ian Roberts, David Yates, Hallema Shakur)
- Financovanie cez Medical Research Council
- Lacné lieky
- Pri menších účinkoch je potrebný veľký súbor
- Celosvetová spolupráca, rozvojové krajiny, vrátane CZ a SK 49 / 239 / 10 008
  40 / 274 / 20 211
  29 / 175 / 12 737

Štúdie CRASH 1, 2, 3

- Spolupráca lekár + sestra
- Pocit dobre vykonanej práce
- Vysoká dohľadanosť
- Transparentne publikovaný protokol (Lancet, peer review)
- Intention-to-treat
- Kvalita štúdie?
- Publikácia v Lancet (IF 59) 2004, 2010, 2019, open access
- Autormi sú všetci zúčastnení
- Dôraz na implementáciu, diseminániu
- Republikácia v národnom jazyku

Štúdie CRASH 1, 2, 3

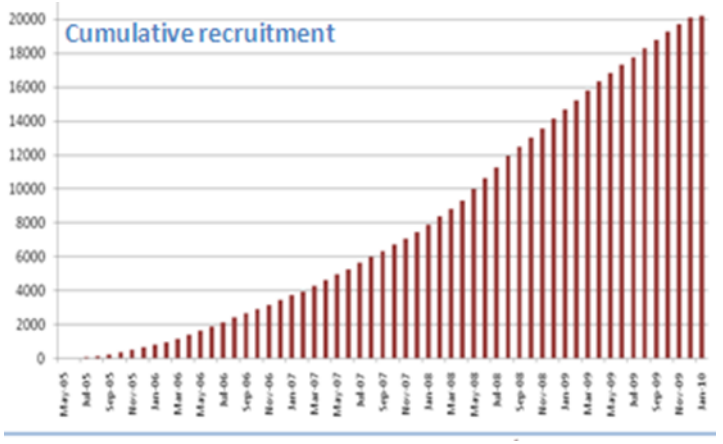
- Big international study
- Keep it simple, recruit thousands
- No extra work, no extra changes in practice
- No extra tests



Štúdie CRASH 1, 2, 3

- Big international study
- Keep it simple, recruit thousa
- No extra work, no e
- No extra tests

Zapájať sa!



Ďakujem za pozornosť

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