

CONTROVERSIES AND PROBLEMS. 18th Annual Symposium, 2014 SAM MOKGOKONG (Prof and Head: Dept of Neurosurger











PRESENTATION PLAN: (A) INTRODUCTION (B) TBI PATHOPHYSIOLOGY (C) AIRWAY MANAGEMENT (D) SHOCK MANAGEMENT (E) RECOMMENDATIONS WITH **RESPECT TO TRAUMATIC BRAIN INJURY**

ADVANCES IN TRAUMA RESUSCITATION

(A) INTRODUCTION

- Recent pre-hospital advances by trauma surgeons recognised
- Neurosurgeons have to keep pace, for the brain's perspective
- In trauma, physiology protects the brain
- Brain function becomes a good monitor
- The monitoring function is lost in TBI
- Hence physicians to protect the brain



(B) TBI PATHOPHYSIOLOGY

- TCDB ... pathophysiology of TBI (J Neurosurg 75; Nov 1991)
- In about 80% deaths from severe TBI, evidence of cerebral ischaemia @ p.m.
- Evidence of hypoxia also abundant
- Hypotension and hypoxia recognised as causes of secondary brain damage
- Most occurred pre-hospitalisation



Pathophysio (cont.)

• CPP = MAP - ICP

- Cerebral auturegulation ensures CPP stable @ 50 mmHg <MAP<150mmHg
- This ability is lost in TBI
- Therefore, physicians have to do it
- CPP has to be kept @ 60-70 mmHg
- i.e. MAP has to be kept @ 90 mmHg because ICP is 20 mmHg+



CEREBRAL AUTOREGULATION





(C) AIRWAY MANAGEMENT ADVANCES

- Paramedic RSI leads to increased mortality, decrease in good outcomes *J Trauma 2003 Mar; Cochrane Review studies from 9 USA centres*
- In TBI, intubation is advocated for GCS 8 or less, to protect the airways
- The GCS has to be assessed 6 hrs + after the trauma, not on the street!!



Airway...(cont.)

- Note the definitions...
- Concussion: I.o.c. for 0 6 hrs post...
- Mild DAI: I.o.c. from 6 24 hrs
- Mod DAI: I.o.c > 24 hrs; no posturing
- Sev DAI: I.o.c. > 24 hrs; + posturing
- Thus before 6 hrs, many patients are still concussed. RSI inappropriate and even downright dangerous!



(D) SHOCK MANAGEMENT ADV...

- Permissive hypotension or "low volume resucitation" improves tissue perfusion whilst decreasing additional blood loss, avoiding haemodilution and coagulopathy. *NEJM 1994; J Trauma* 2002; J Trauma 2007
- A drip is put up; 250ml bolusses…



Shock Mx (cont.)

- This is appropriate if no TBI (physio)
- In TBI...CPP = MAP ICP
- If CPP > 20 mmHg; MAP has to be > 90 mmHg, for CPP to be >70 mmHg
- Permissive hypotension inappropriate
- Pre-hospital procedures increase the risk of death J Trauma 2007,63(1)



(E) RECOMMENDATIONS FOR TBI

For Airway Management:-

- Simple patient stabilisation... ATLS
- Suction procedure necessary (clear)
- Oropharyngeal airway, Oxygen mask
- "Scoop and run" philosophy supported(Ann Surg 2003; Lieberman et al)



Recommendations...(cont.)

For Shock Management:-

- ATLS stabilisation on board
- Head-end flat... (no 30 degr elevation)
- Run resuscitaion fluid at set rate
- Do not tolerate radial pulse disappearing...i.e. increase rate!



In conclusion...

- The situation of penetrating injuries and severing of deep-seated vessels, with bleeding to shock, is fortunately<10% of trauma cases. In >90% of cases, the regular resuscitation methods should prevail (Emerg Med Prac 2011)
- Such injuries usually do not have TBI as well (isolated, or directed)



Questions?

