Prehospital Advanced Airway Management

Does it work?

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Advanced airway management

- Does it work?
  - Can we manage the airway?
  - Can we use advanced airway skills?
  - Does advanced airway management improve patient outcomes?
The problem

- The difficult and obstructed airway is a common problem
The scope of the problem

- Auckland district alone
- Approx 400 status one patients with obstructed airway per year
- Relatively common problem
The problem

- Airway obstruction a common prehospital problem
- Airway obstruction a particularly difficult problem when combined with trismus
- Airway obstruction may worsen secondary injury in patients with brain injuries
- Secondary injury increases mortality and morbidity
Secondary injury

- We have become increasingly aggressive at targeting secondary injury in the brain injured
- We have become more aggressive with interventions to limit secondary injury
- But we have made few gains in dealing with the obstructed airway
Intubation without drugs

- Intubation without drugs uncommon prehospital
  - patients need to be very unconscious
- Intubation without drugs prehospital associated with very high mortality
- Sedation alone has been used to try to overcome trismus
  - significant concern that this approach may worsen secondary injury
What about suxamethonium?

- Suxamethonium considered by many to be doctor only skill
  - concerns regarding failed intubation
- Our failed intubation rate is very low
- Increasingly convinced that suxamethonium could be safely and appropriately used by selected advanced care paramedics
A possible answer to the problem

- Sedation alone was not the answer
- Answer was to take complete control
- Answer was for advanced care officers to have advanced airway skills
- Answer was for advanced airway skills to include use of suxamethonium
Take the bull by the horns

- Feasibility trial of prehospital RSI
- A certain degree of caution
  - we didn’t want the treatment to be worse than the disease
- Put together a procedure
- Put together a training package
- Trained a small number of selected officers
- Feasibility trial and review at twelve months
But

- When taking the bull by the horns........
Don’t......

- Don’t let the bull get the upper hand......

Columbian matador Monito Deltran takes the full force of revenge during a bullfight in Bogota in September 1997. The goring resulted in what was described as 'horrendous injuries'.
Feasibility trial of prehospital RSI

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Everyone wanted to be part of it
Feasibility trial of prehospital RSI

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Patient selection

- **Indications**
  - GCS less than or equal to nine and
  - difficult obstructed airway and
  - more than 15 mins from hospital

- **Contraindications**
  - elderly (> 70 yrs) with stroke
  - suspected difficult intubation
  - paraplegics/quadriplegics
  - muscle disorder with long term weakness
Drug selection for RSI

- Midazolam to attenuate ICP rise
  - chosen for simplicity

- Suxamethonium as initial NMB
  - chosen for speed of onset and offset
  - stored in pouches, pouch in fridge when not on duty
  - lasts at least a month

- Vecuronium as second NMB
  - chosen for shelf life
The procedure

- Check inclusion and exclusion criteria
- Midazolam given to attenuate ICP rise
  - 4mg adults and children > 10 years
  - 2mg in children < 10 years
  - none if shocked
- Suxamethonium 1 mg/kg
- Vecuronium .1 mg/kg given post confirmation of ETT placement
Confirmation of ETT placement

- I wanted to introduce capnography
- Capnography unable to be introduced initially because of cost
- EID introduced
- Capnography now being introduced
- Capnography now being used for confirmation of ETT position and for guiding ventilation
Failed intubation drill

- Failed intubation was our biggest concern
- A range of alternative airway devices were considered
  - laryngeal mask airway (incl disposable)
  - combitube
  - airway management device
- Decision postponed until national decision made on alternative airway device
Failed intubation

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RSI data so far

- Ten trained officers
- Twelve months
- 21 patients
  - 12 trauma
  - 3 subarachnoid haemorrhage
  - 4 poisoning
  - 2 asthma
- One failed intubation
RSL data so far

- Numbers disappointingly low
- No inappropriate patients
- Many missed patients
  - no RSI trained officer available
  - officer chose not to do it
- Numbers are too small to make any firm conclusions
- It appears safe to continue with feasibility trial
RSI now

- More officers being trained
- Focusing on training officers with the ability to get where they are needed
- Capnography will be compulsory
- Alternative airway device for failed intubation will be introduced
- I don’t see it becoming part of the standard skills for all
The future

- Open mind on the role of pre-hospital RSI by advanced care paramedics
- I would like to see data that it improves patient outcomes
- Several randomised trials underway
- I remain uncertain how many each officer needs to do to maintain competency
- Decision making skills more important than mechanical skills
Summary

- Does prehospital advanced airway management work?
- I think it should reduce secondary injury
- I think reducing secondary injury should improve outcomes
- I await randomised outcome data
- I have an open mind in the meantime
Any questions?