Prospective Assessment Project on Airway Management in Anaesthesia – Improving airway management and patient safety through optimisation of airway management strategies

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Background

- NAP4 revealed alarming numbers of major airway events
- Incidence of minor airway events is unclear
- It is unclear how to decrease airway events

Methods

- Hypothesis: Implementation of a bundle of 5 institutional airway management strategies will reduce major and minor airway events
- IRB approval; Prospective open before-and-after cohort study in elective and emergency general anaesthesia

Phase 1

- Prospective recording of all major and minor airway events during 2 months
- Minor incidents as precursors of major incidents (Swiss Cheese Model)

Phase 2

- Implementation and teaching of 5 institutional airway management strategies with potential to reduce airway events (concept of accumulation of marginal gains)

Phase 3 (ongoing)

- Prospective recording of all major and minor airway events during 2 months as done in phase 1

Results from phase 1

3670 airway management cases screened

Single event	Several events	Total events
387 (10.5%)	187 (5.1%)	574 (15.6%)

- No airway-related death
- No airway-related unplanned ITU admission

% of incidents	cases with events (n=574)	all cases (n=3670)
Difficult bag mask ventilation	24.4	3.8
Several management attempts	20.9	3.3
Cormack/Lehane grade ≥ 3	18.3	2.9
Hypoxia or desaturation $< 95\%$	17.8	2.8
Tube advancement failure	11.0	1.7
Oesophageal intubation	8.2	1.3
Change of airway strategy	6.4	1.0
Soft tissue lesion	6.4	1.0
Bleeding	5.4	0.8
Laryngospasm	3.3	0.5
Leak of laryngeal mask	2.6	0.4
Defective equipment	2.4	0.4
Regurgitation/ vomit in airway	2.1	0.3
Insufficient postoperative breathing	1.9	0.3
Bronchospasm	1.6	0.2
Dislocation of tube	1.6	0.2
Epistaxis	1.2	0.2
Cuff leakage	1.0	0.2
Dental damage	1.0	0.2
Glottic swelling	1.0	0.2

Bundle of airway management strategies

1. Abandon the check of bag mask ventilation before neuromuscular blockade
2. Optimize preoxygenation (etO₂ 80-90%, apnoeic oxygenation)
3. Establish and communicate an airway management plan
4. Airway management switches to the most experienced person after 2 failed attempts
5. Use videolaryngoscopy whenever available

Conclusions

- **Major or minor airway management-related events occur in over 15% of cases**
- **Based on these data a bundle of 5 changes to institutional airway management strategies was implemented**
- **The currently ongoing follow-up phase aims to assess a possible reduction of airway management-related events**