



Comprehensive moUth hygiene and Post-operative Pneumonia (CUPPA)

South West Anaesthesia Research Matrix

SASWR Autumn meeting 24-25th November 2016, Exeter

Introduction

Postoperative pulmonary complications (PPC), which include pneumonia, are the leading cause of death in both cardiac and non-cardiac surgery. They increase morbidity, length of hospital stay and critical care admission rate (1). 30-day mortality is higher in patients with a PPC (19.5%) than in those without (0.5%). (2)

The incidence of postoperative pneumonia has been reported to be around 8% in intermediate to high-risk patients undergoing major abdominal surgery. (3)

While there is a wealth of research into the prevention of ventilator associated pneumonias on the intensive care unit, including the application of chlorhexidine to the oropharynx, there are few studies looking into the prevention of postoperative pneumonias in the non-ventilated patient.

An oral hygiene intervention may be a simple, cheap method of reducing this significant burden of post-operative pneumonia, and therefore reduce patient mortality, morbidity and length of stay whilst improving patient experience

Methods

CUPPA was a pilot, multi-centre, RCT. Aiming to recruit 120 patients over the six SWARM sites. Recruitment took place between June 2015 and July 2016. Target population: Adult patients undergoing major elective abdominal surgery, predicted to be at moderate (ARISCAT Score ≥ 26) or high risk (>45) of post-operative pneumonia.

Intervention: Pre-operative plaque scoring and 0.2% chlorhexidine mouthwash. Twice daily chlorhexidine mouthwash and once daily 1% chlorhexidine toothpaste post-operatively for 7 days or until discharge.

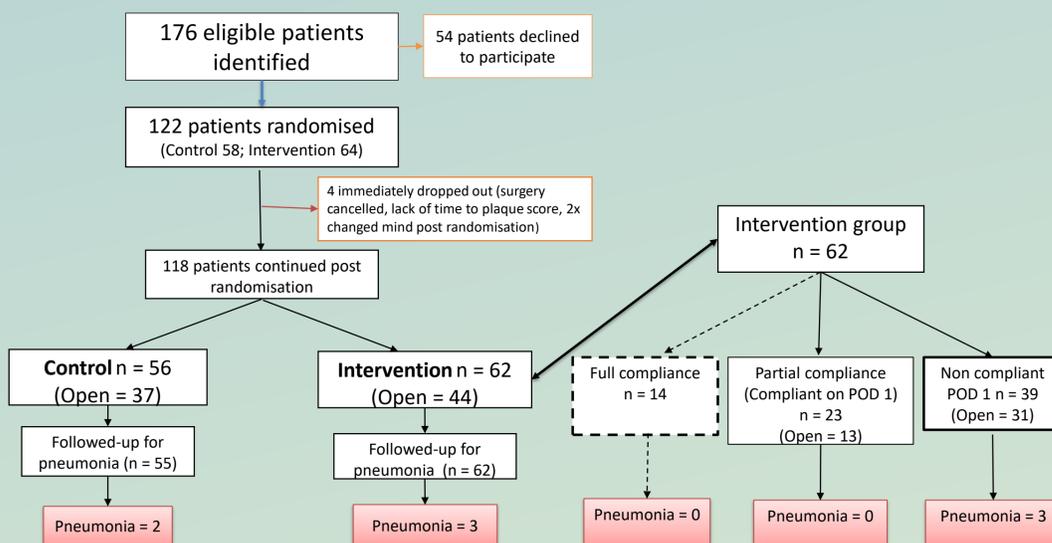
Control: Pre-operative plaque scoring then usual mouth care.

Randomisation via www.sealedenvelope.com with the pneumonia data collector blinded to the randomisation.

Primary outcome: To test patient compliance with the comprehensive peri-operative oral hygiene regimen and feasibility across the six sites.

Secondary outcomes: To establish the incidence of post-operative pneumonia by day 7 and also by day 30. Pilot data to explore any differences between groups. Plaque scores pre-operatively and at 5-7 days postoperatively.

Results



Recruitment was completed ahead of schedule, all sites recruited patients:

➤ Torbay = 47; Derriford = 24; Exeter = 22; Truro = 22; Taunton = 3; Barnstaple = 2

Poor compliance with intervention:

➤ 14/62 (23%) fully compliant; 23/62 (37%) compliant on post-op day 1

Low overall pneumonia rate (4.2%)

On intention to treat analysis no difference in pneumonia rates:

➤ 2/56 control vs 3/62 intervention

On per-protocol analysis, signal that there might be a difference in pneumonia rates:

➤ 23 pts compliant on post op day 1: Pneumonia = 0

➤ 39 pts non-compliant on post op day 1 + 56 controls: Pneumonia = 5

Plaque scores

- Discharge scores completed in 58 patients (49%)
 - Control = 31; Intervention = 27
- 13 (11%) patients refused repeat plaque score or had previously withdrawn from the study.
 - Control = 2; Intervention = 11
- 47 (40%) were missed prior to discharge (lack of trainees / weekend discharges)

Mean pre-op plaque score in non-pneumonia cases (n=112): 1.5725
Mean pre-op plaque score in pneumonia cases (n=5): 2.322, p = 0.044

	Pneumonia cases				
	All procedures		95% CI	Open Procedures	
	Number (%)			Number (%)	95% CI
All cases (n = 117)	5 (4.27)	1.40 – 9.69	All cases (n = 81)	3 (3.66)	0.76 – 10.32
Intention to treat			Intention to treat		
Control (n = 55)	2 (3.64)	0.44 – 12.53	Control (n = 37)	2 (5.26)	0.64 – 17.75
Intervention (n = 62)	3 (4.84)	1.01 – 13.5	Intervention (n = 44)	1 (2.27)	0.06 – 12.02
Per protocol Day 1			Per protocol Day 1		
Control (n = 94)	5 (5.38)	1.77 – 12.10	Control (n = 68)	3 (4.41)	0.92 – 12.36
Intervention (n = 23)	0	0 – 14.82	Intervention (n = 13)	0	0 – 24.71

Discussion

- Pneumonia rates were lower than expected from that reported in the literature, reasons for this are not yet clear.
- A rigorous oral hygiene regime is poorly tolerated by patients in the immediate post-operative period. However, those compliant on day 1 did not get pneumonia in this study.
- Complex follow-up (plaque scoring) is labour intensive and requires active patient participation, therefore it is poorly done.
- Poor pre-operative dental hygiene may increase the risk of post-operative pneumonia.
- This pilot has provided useful feasibility data which is being used as part of a funding application for an international RCT assessing the effectiveness of pre-operative chlorhexidine mouthwash use on reducing post-operative pneumonia (Chlorhexidine Mouthwash prior to anaesthesia in patients undergoing Major elective Abdominal Surgery - COMMAS).

References:

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- Canet J et al on behalf of the ARISCAT group. Prediction of Postoperative Pulmonary Complications in a Population-based Surgical Cohort. *Anesthesiology*. 2010; 113(6): 1338-50.
- Futier E, Constantin J-M, Paugam-Burtz C, Pascal J, Eurin M, Neuschwander A, et al. A Trial of Intraoperative Low-Tidal-Volume Ventilation in Abdominal Surgery. *N Engl J Med*. 2013; 369(5): 428-37

