Ventilator Associated Pneumonia (VAP) — Improving Practice With An Audited Oral Care Intervention

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BACKGROUND

VAP is one of the most common hospital-acquired infections, associated with increased morbidity, mortality, and costs.1 Although definitions vary, VAP typically refers to pneumonia that arises ≥48 hours after intubation and mechanical ventilation.2 While there are non-modifiable risk factors for VAP, risk factors such as supine position, dental plaque, and oropharyngeal colonization are amenable to intervention.3-5 Our nine-bed, level 3 intensive care unit (ICU) cares for patients requiring ventilation, haemofiltration, and other complex therapies. We average 2200 ventilation days per year and have a patient-to-nurse ratio of one-to-one or one-to-two; a doctor is available at all times. Ventilation does not inevitably result in VAP, but VAP is a quality indicator. The European VAP benchmark for ICUs is a rate of 5% to 15% while the US benchmark is 3 to 20 cases per 1,000 ventilator-days.1 Use of advanced tools, a comprehensive oral care protocol, and staff compliance with the protocol is associated with significantly reduced rates of ventilator-associated pneumonia.4 A cost-effective analysis found that oropharyngeal decontamination led to VAP prevention and was cost saving for ICU patients.9

OBJECTIVES

We hypothesized that our standard mouth care practices could be improved by implementing a new oral care kit. The objective of this study was to audit ventilator care bundle compliance for three months after instituting a new ventilator mouth care protocol and then revert to our unit’s standard oral care practice for an additional three months.

METHODS

The CDC (2012) VAP definition was adapted (Fig. 1).4 Q•Care™ “Rx Oral Cleansing and Suctioning System with 3M™ Periact” (Chlorhexidine Gluconate 0.12%) Oral Rinse (Sage Products, Cary, IL, USA) oral care system was used for three months, beginning in September, 2012 (Fig. 2). The cost of the system was to be fully reimbursed if the VAP rate was the same or worse than our standard practice. In November 2012, we reverted to our standard oral care practices, which was to perform mouth care using a small toothbrush, every 3 hours, and toothpaste at least twice a day; lip moisturisers and any other solutions were used as necessary. A senior nurse audited the ventilator care bundles daily for a further three months (Fig. 3). VAP rates, bundle compliance, nurse satisfaction, and anti-fungal (Nystatin) use were monitored.

RESULTS

VAP

In the Q•Care™ system group, 135 patients were admitted to the ICU, 91 were ventilated, and 14 had a subglottic tube. In the standard oral care protocol group, 129 patients were admitted to the ICU, 87 were ventilated, and 31 had a subglottic tube.

There were no cases of VAP while the Q•Care™ system was in use and one case with the standard oral care protocol (Fig. 4).

Nystatin was not needed with the Q•Care™ system, but was needed twice with the standard oral care protocol.

Compliance

Similar levels of compliance were observed for the majority of the elements of the ventilator care bundle during both the Q•Care™ system and standard oral care portions of the study (Fig. 5).

CONCLUSIONS

Ventilation does not inevitably result in VAP, but VAP is a quality indicator. The European VAP benchmark for ICUs is a rate of 5% to 15% while the US benchmark is 3 to 20 cases per 1,000 ventilator-days.1 Use of advanced tools, a comprehensive oral care protocol, and staff compliance with the protocol is associated with significantly reduced rates of ventilator-associated pneumonia.4 A cost-effective analysis found that oropharyngeal decontamination led to VAP prevention and was cost saving for ICU patients.9

It was previously thought that VAP was not a particular problem in our ICU, and that oral care practices were sufficient, but we now see room for improvement. Mouth care and nursing staff satisfaction with the Q•Care™ system were much better than with our standard practice. Nursing staff reported anecdotally that patient mouths were cleaner. Only one case of VAP was noted during the entire study period, suggesting good compliance with the ventilator bundle. Nystatin has not been required for any patient using Q•Care™.

In conclusion, the Q•Care™ system provided better staff compliance and satisfaction with the ventilator care bundle. Instituting this system has the potential to prevent VAP and result in better patient outcomes and less healthcare resource use. As we implement this new, comprehensive oral care system, we will continue to monitor the results.

REFERENCES