A Comprehensive Oral Care Program Reduces Rates of Ventilator-Associated Pneumonia in Intensive Care Unit Patients

Kathy Hutchins, RN, MSN, George Karras, MD, Joan Erwin, RN, BSN, and Kevin Sullivan, RN, BSN, CIC • Mercy Medical Center, Springfield, MA

ABSTRACT

A Comprehensive Oral Care Program Reduces Rates of Ventilator-Associated Pneumonia in Intensive Care Unit Patients

Background

Ventilator-associated pneumonia (VAP) is a nosocomial pneumonia that develops in patients who have been on mechanical ventilation for 48 hours or more. A study of intensive care unit (ICU) patients by Ibrahim et al2 found a mortality rate of 32.2% in patients without VAP. VAP contributes to longer ICU stays and higher medical costs. The diagnosis of VAP was made by a medical doctor on the basis of clinical judgment, microbiologic data (Gram stain and culture results), and radiographic evidence of a new pneumonia. The protocol was instituted in May 2005. In January 2007, the oral care kit was changed from a CPC-containing kit to a CHG-containing kit.

Methods

All mechanically ventilated patients admitted to the ICU between May 2005 and December 2007 were included in the performance improvement project study population. Patients were excluded if they had a contraindication to the oral care intervention (e.g., severe oral trauma). The IHV ventilator bundle was adapted and the patients received a minimum of oral care every 4 h and as needed. Compliance was automatically monitored in the medical record and was reported as the number of kits/number of ventilator days (kit used per ventilator day). Instructions for oral care were as follows:

1. Replace suction line, tubing, and covered oral suction device every 24 h.
2. Brush teeth using suction toothbrush with oryzalin or chlorhexidine (0.12% solution) twice a day on even numbered days. Use pHIX to reduce the incidence of VAP. The diagnosis of VAP was made by a medical doctor on the basis of clinical judgment, microbiologic data (Gram stain and culture results), and radiographic evidence of a new pneumonia. The protocol was instituted in May 2005. In January 2007, the oral care kit was changed from a CPC-containing kit to a CHG-containing kit.

Results

The decrease in VAP rates from 2004 to 2007 represented a 89.7% decrease. For the year 2006, the VAP rate was 3.57 (2 cases/1000 ventilator days). For the year 2007, the CHG kit was used in the oral care kits, the VAP rate was 1.2 (3 cases/1531 ventilator days).

Conclusions

1. The use of an Oral Care Protocol intervention and ventilator bundle led to a 89.7% reduction in the rate of VAP in mechanically ventilated patients.
2. Reduction in VAP rates from 2004 to 2007 is likely due to a decrease in oral bacterial load through removal of plaque, mucous, and bacteria from the oropharynx and through the antibacterial activity of the antiseptic solution, hydrogen peroxide mouthwash, and replacement of CPC with CHG in 2007.
3. Routine suctioning and application of a moisturizer may also have contributed to the reduction in VAP rates.
4. In addition, the improvement in compliance over time potentially contributed to the improvement in VAP rates.

A Comprehensive Oral Care Program Reduces Rates of Ventilator-Associated Pneumonia in Intensive Care Unit Patients

Kathy Hutchins, RN, MSN, George Karras, MD, Joan Erwin, RN, BSN, and Kevin Sullivan, RN, BSN, CIC • Mercy Medical Center, Springfield, MA

ABSTRACT

A Comprehensive Oral Care Program Reduces Rates of Ventilator-Associated Pneumonia in Intensive Care Unit Patients

Background

Ventilator-associated pneumonia (VAP) is a nosocomial pneumonia that develops in patients who have been on mechanical ventilation for 48 hours or more. In a study of intensive care unit (ICU) patients by Ibrahim et al,2 VAP contributes to longer ICU stays and higher medical costs. In a study of intensive care unit (ICU) patients by Ibrahim et al,2 VAP contributes to longer ICU stays and higher medical costs. The diagnosis of VAP was made by a medical doctor on the basis of clinical judgment, microbiologic data (Gram stain and culture results), and radiographic evidence of a new pneumonia. The protocol was instituted in May 2005. In January 2007, the oral care kit was changed from a CPC-containing kit to a CHG-containing kit.

Methods

All mechanically ventilated patients admitted to the ICU between May 2005 and December 2007 were included in the performance improvement project study population. Patients were excluded if they had a contraindication to the oral care intervention (e.g., severe oral trauma). The IHV ventilator bundle was adapted and the patients received a minimum of oral care every 4 h and as needed. Compliance was automatically monitored in the medical record and was reported as the number of kits/number of ventilator days (kit used per ventilator day). Instructions for oral care were as follows:

1. Replace suction line, tubing, and covered oral suction device every 24 h.
2. Brush teeth using suction toothbrush with oryzalin or chlorhexidine (0.12% solution) twice a day on even numbered days. Use pHIX to reduce the incidence of VAP.
3. Apply mouth moisturizer to mucous membranes, buccal cavity, and lips every 4 h after major position changes.

Results

The decrease in VAP rates from 2004 to 2007 represented a 89.7% decrease. For the year 2006, the VAP rate was 3.57 (2 cases/1000 ventilator days). For the year 2007, the CHG kit was used in the oral care kits, the VAP rate was 1.2 (3 cases/1531 ventilator days).

Conclusions

1. The use of an Oral Care Protocol intervention and ventilator bundle led to a 89.7% reduction in the rate of VAP in mechanically ventilated patients.
2. Reduction in VAP rates from 2004 to 2007 is likely due to a decrease in oral bacterial load through removal of plaque, mucous, and bacteria from the oropharynx and through the antibacterial activity of the antiseptic solution, hydrogen peroxide mouthwash, and replacement of CPC with CHG in 2007.
3. Routine suctioning and application of a moisturizer may also have contributed to the reduction in VAP rates.
4. In addition, the improvement in compliance over time potentially contributed to the improvement in VAP rates.

A Comprehensive Oral Care Program Reduces Rates of Ventilator-Associated Pneumonia in Intensive Care Unit Patients

Kathy Hutchins, RN, MSN, George Karras, MD, Joan Erwin, RN, BSN, and Kevin Sullivan, RN, BSN, CIC • Mercy Medical Center, Springfield, MA

ABSTRACT

A Comprehensive Oral Care Program Reduces Rates of Ventilator-Associated Pneumonia in Intensive Care Unit Patients

Background

Ventilator-associated pneumonia (VAP) is a nosocomial pneumonia that develops in patients who have been on mechanical ventilation for 48 hours or more. A study of intensive care unit (ICU) patients by Ibrahim et al,2 VAP contributes to longer ICU stays and higher medical costs. In a study of intensive care unit (ICU) patients by Ibrahim et al,2 VAP contributes to longer ICU stays and higher medical costs. The diagnosis of VAP was made by a medical doctor on the basis of clinical judgment, microbiologic data (Gram stain and culture results), and radiographic evidence of a new pneumonia. The protocol was instituted in May 2005. In January 2007, the oral care kit was changed from a CPC-containing kit to a CHG-containing kit.

Methods

All mechanically ventilated patients admitted to the ICU between May 2005 and December 2007 were included in the performance improvement project study population. Patients were excluded if they had a contraindication to the oral care intervention (e.g., severe oral trauma). The IHV ventilator bundle was adapted and the patients received a minimum of oral care every 4 h and as needed. Compliance was automatically monitored in the medical record and was reported as the number of kits/number of ventilator days (kit used per ventilator day). Instructions for oral care were as follows:

1. Replace suction line, tubing, and covered oral suction device every 24 h.
2. Brush teeth using suction toothbrush with oryzalin or chlorhexidine (0.12% solution) twice a day on even numbered days. Use pHIX to reduce the incidence of VAP.
3. Apply mouth moisturizer to mucous membranes, buccal cavity, and lips every 4 h after major position changes.

Results

The decrease in VAP rates from 2004 to 2007 represented a 89.7% decrease. For the year 2006, the VAP rate was 3.57 (2 cases/1000 ventilator days). For the year 2007, the CHG kit was used in the oral care kits, the VAP rate was 1.2 (3 cases/1531 ventilator days).

Conclusions

1. The use of an Oral Care Protocol intervention and ventilator bundle led to a 89.7% reduction in the rate of VAP in mechanically ventilated patients.
2. Reduction in VAP rates from 2004 to 2007 is likely due to a decrease in oral bacterial load through removal of plaque, mucous, and bacteria from the oropharynx and through the antibacterial activity of the antiseptic solution, hydrogen peroxide mouthwash, and replacement of CPC with CHG in 2007.
3. Routine suctioning and application of a moisturizer may also have contributed to the reduction in VAP rates.
4. In addition, the improvement in compliance over time potentially contributed to the improvement in VAP rates.