Prevention of Hospital-Associated Pneumonia Using a Comprehensive Oral Hygiene Protocol

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Abstract

Health Care Associated Pneumonia Prevention Using a Comprehensive Oral Hygiene Protocol

Introduction

Hospital-acquired pneumonia (HAP) is defined as pneumonia that develops in patients who are not ventilated but who develop a respiratory infection within 48 hours to 2 days after being hospitalized.1 Healthcare-associated pneumonia (HCAP) is defined as a positive respiratory culture within 2 days of hospital admission in patients who were transferred from another facility, were receiving long-term dialysis, or had been hospitalized within 30 days.2

Morbidity and mortality are high with both HAP and HCAP. In a study of data from a large multicenter database, the mortality rate was 18.8% for HAP and 19.4% for HCAP.3 The mean hospital length of stay increased by 15.2 ± 13.6 days with HAP and by 8.8 ± 7.8 days with HCAP.4 The mean total hospital charges were $27,447 for patients with HCAP and $65,292 for patients with HAP.5

Methods

The new oral protocol was initiated in all non-critical care, non-ventilated neurological and orthopedic patients on this 42-bed unit beginning in April 2006. A patient education sheet on HCAP and the oral care protocol was given to all study patients at the time of admission. Representatives from Sage Products, Inc. (Cary, IL), the Service Lead, and the Unit Manager, Improvement representative collaborated to train the staff on how to implement the protocol. The protocol was reinforced and outcomes were reviewed quarterly, and a Cerner documentation screen was created.

Oral-care protocol:

- Brush teeth every 12 hours with the sodium bicarbonate impregnated suction toothbrush from the oral-care kit which contains Anti-Plaque Solution to help dissolve mucous and biofilm.
- After implementation of the Oral-Care Protocol issue:
- HAP rates began to decrease: from 3 cases in April 2006 (the first month of the study) to 0 cases by July 2006.

Results

The HAP rate per 1000 patient days decreased from 1.83 in 2004 to 1.0 in 2007 – a 45% reduction.

Discussion

The results indicate that the use of a comprehensive oral hygiene program can lead to reduced rates of HAP.1

- The number of HAP infections had been higher in this patient population than in other areas in the hospital prior to implementation of the protocol.

- After implementation, the HAP rates decreased to a comparable level or less. Education of the patients about oral care provided them with the information necessary for them to better participate in their own care.

Although our study was not designed to determine cost savings, it is very likely that the small costs associated with prevention resulted in a reduction in the overall costs of care because of the reduction in the rate of HAP.

Costs Estimated Savings

- Each case of HCAP/HAP costs $27,000 to $65,000.1
- Cost of the oral-care kits: 
  - package of 6 cleansings (24-hour supply) = $16.80
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- Average length of stay on this unit is 4 days, so the total cost per case for 4 days is $108.74 X 4 = $434.96

- $67,200 for the patient length of stay for prevention compared with up to $65,000 per case of HAP!

References:

4. Sumi Y, Miura H, Michiwaki Y, Nagaosa S, et al. Aspiration of bacteria from oral biofilms (dental plaque) was 29.3%, the mean length of stay was 23.0 ± 20.3 days, and the mean total hospital charges were $15,854.1

Health Care Associated Pneumonia Prevention Using a Comprehensive Oral Hygiene Protocol

Issue: An initiative to develop a comprehensive and evidence-based oral-care protocol to prevent HAP and to evaluate the effectiveness of the new oral-care protocol and the impact on the rates of HAP.

In our facility, the orthopedic and neurology units (Ortho/Neuro) had the highest rates of HAP (post-operative and medical) in 2004. The hospital’s rate of HAP was 1.83 cases/1000 patient days from 2003 to 2007. This represented a 46% reduction in the rate of HAP from 2004 to 2007.

Goal: To determine the effectiveness of a comprehensive oral hygiene protocol in reducing the incidence of HAP.

Methods

1. Hospital-acquired pneumonia (HAP) is defined as pneumonia that develops in patients who are not ventilated but who develop a respiratory infection within 48 hours to 2 days after being hospitalized. It is defined as a positive respiratory culture within 2 days of hospital admission in patients who were transferred from another facility, were receiving long-term dialysis, or had been hospitalized within 30 days.

2. Morbidity and mortality are high with both HAP and HCAP. In a study of data from a large multicenter database, the mortality rate was 18.8% for HAP and 19.4% for HCAP. The mean hospital length of stay increased by 15.2 ± 13.6 days with HAP and by 8.8 ± 7.8 days with HCAP. The mean total hospital charges were $27,447 for patients with HCAP and $65,292 for patients with HAP.

3. Aspiration of oropharyngeal secretions plays a central role in the development of pneumonia, particularly in patients with abnormalities in swallowing and upper-airway protective reflexes.

Purpose

In 2004, the orthopedic and neurology units of our facility had the highest rates of HAP (post-operative and medical pneumonia), i.e., 1.83 cases/1000 patient days. We studied the efficacy of an oral hygiene protocol that implemented a new oral cleansing kit and an evidence-based oral-care protocol in reducing the incidence of HAP.

Discussion

- The new oral-care protocol was initiated in all non-critical care, non-ventilated neurological and orthopedic patients on this 42-bed unit beginning in April 2006. A patient education sheet on HCAP and the oral care protocol was given to all study patients at the time of admission. Representatives from Sage Products, Inc. (Cary, IL), the Service Lead, and the Unit Manager, Improvement representative collaborated to train the staff on how to implement the protocol. The protocol was reinforced and outcomes were reviewed quarterly, and a Cerner documentation screen was created.

- The HAP rate per 1000 patient days decreased from 1.83 in 2004 to 1.0 in 2007 – a 45% reduction.

References:

1. Sumi Y, Miura H, Michiwaki Y, Nagaosa S, et al. Aspiration of bacteria from oral biofilms (dental plaque) was 29.3%, the mean length of stay was 23.0 ± 20.3 days, and the mean total hospital charges were $15,854.

- Aspiration of oropharyngeal secretions plays a central role in the development of pneumonia, particularly in patients with abnormalities in swallowing and upper-airway protective reflexes.

- Hospital-acquired pneumonia (HAP) is defined as pneumonia that develops in patients who are not ventilated but who develop a respiratory infection within 48 hours to 2 days after being hospitalized.

- The results indicate use of the comprehensive oral-care protocol which included the oral cleansing kit was effective in reducing the rates of HCAP.

- There is evidence that a comprehensive oral hygiene protocol may significantly reduce HCAP in high-risk patient populations and deserves further study.

- The new oral-care protocol was initiated in all non-critical care, non-ventilated neurological and orthopedic patients on this 42-bed unit beginning in April 2006. A patient education sheet on HAP prevention and the oral-care protocol were given to all study patients at the time of admission. Representatives from Sage Products, Inc. (Cary, IL), the Service Lead, and the Unit Manager, Improvement representative collaborated to train the staff on how to implement the protocol. The protocol was reinforced and outcomes were reviewed quarterly, and a Cerner documentation screen was created.

- The HAP rate per 1000 patient days decreased from 1.83 in 2004 to 1.0 in 2007 – a 45% reduction.

- The results indicate that the use of a comprehensive oral hygiene program can lead to reduced rates of HAP. The number of HAP infections had been higher in this patient population than in other areas in the hospital prior to implementation of the protocol.

- After implementation, the HAP rates decreased to a comparable level or less. Education of the patients about oral care provided them with the information necessary for them to better participate in their own care.

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