REDCUON OF MICROBIAL COLONIZATION IN THE OROPHARYNX AND DENTAL PLAQUE REDUCES VENTILATOR-ASSOCIATED PNEUMONIA.

R. Garcia, L. Jendresky, L. Colbert. Brookdale University Medical Center (BUMC), Brooklyn, NY.

ABSTRACT

EDUCATION OF MICROBIAL COLONIZATION IN THE OROPHARYNX AND DENTAL PLAQUE REDUCES VENTILATOR-ASSOCIATED PNEUMONIA.

R. Garcia, L. Jendresky, L. Colbert. Brookdale University Medical Center (BUMC), Brooklyn, NY.

BACKGROUND

It is estimated that 150,000 to 300,000 cases of nosocomial pneumonia occur each year in the United States. Suggested for implementation are interventions that limit the exposure to respiratory pathogens, including proper oral hygiene practices. The efficacy and cost effectiveness of various intervention strategies for the prevention and control of nosocomial pneumonia are discussed.

METHODS

To determine the effectiveness of implementing an integrated oral care system designed to reduce the levels of dental plaque and microbial colonization in the oropharynx, a study was conducted. The results of a study that incorporated oral assessment protocols, oral and dental interventions to reduce dental plaque, and the elimination of dental plaque to reduce bacterial colonization are described.

RESULTS

The methods used included the incorporation of oral care systems that limit the exposure to respiratory pathogens. The results indicate that implementing an integrated oral care system reduced dental plaque and microbial colonization in the oropharynx, thereby reducing the risk of ventilator-associated pneumonia.

DISCUSSION

The results demonstrate the potential benefits of implementing an integrated oral care system. The effectiveness of the intervention can be further improved by incorporating evidence-based practices and promoting interdisciplinary collaboration.

OBJECTIVES

- Identify the association between oropharyngeal and dental plaque and ventilator-associated pneumonia (VAP).
- Implement an intervention to reduce dental plaque and microbial colonization in the oropharynx and reduce the risk of VAP.

TABLE 1

<table>
<thead>
<tr>
<th>Date</th>
<th>Cases</th>
<th>Days</th>
<th>Rate (VAP/1000 VD) Developing VAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 2002</td>
<td>377</td>
<td>20</td>
<td>2.6</td>
</tr>
<tr>
<td>February 2002</td>
<td>456</td>
<td>53</td>
<td>8.5</td>
</tr>
<tr>
<td>March 2002</td>
<td>542</td>
<td>78</td>
<td>9.1</td>
</tr>
</tbody>
</table>

TABLE 2

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Evidence Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of an endotracheal tube with a dorsal drainage (by continuous or frequent intermittent suctioning)</td>
<td>Category I</td>
</tr>
<tr>
<td>Use of oral chlorhexidine gluconate rinses during the perioperative period</td>
<td>Category II</td>
</tr>
<tr>
<td>Avoidance of gastric residuals</td>
<td>Category II</td>
</tr>
<tr>
<td>Use of a diet low in saturated fat and cholesterol</td>
<td>Category II</td>
</tr>
<tr>
<td>Use of stress ulcer drugs</td>
<td>Category II</td>
</tr>
<tr>
<td>Weaning protocol</td>
<td>Category II</td>
</tr>
</tbody>
</table>

TABLE 3

<table>
<thead>
<tr>
<th>Cost Savings</th>
<th>2004 HCUPAC Recommendations</th>
<th>2005 HCUPAC Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level of Evidence</td>
<td>Category</td>
</tr>
<tr>
<td></td>
<td>Category I</td>
<td>Category II</td>
</tr>
<tr>
<td></td>
<td>Category II</td>
<td>Category II</td>
</tr>
<tr>
<td></td>
<td>Category III</td>
<td>Category III</td>
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<tr>
<td></td>
<td>Category IV</td>
<td>Category IV</td>
</tr>
<tr>
<td></td>
<td>Category V</td>
<td>Category V</td>
</tr>
</tbody>
</table>

CONCLUSION

Implementing an integrated oral care system can significantly reduce the risk of ventilator-associated pneumonia. Further research is needed to evaluate the long-term effectiveness of this intervention and to identify strategies to optimize oral care practices.

REFERENCES


REDUCTION OF MICROBIAL COLONIZATION IN THE OROPHARYNX AND DENTAL PLAQUE REDUCES VENTILATOR-ASSOCIATED PNEUMONIA.

R. Garcia, L. Jendresky, L. Colbert. Brookdale University Medical Center (BUMC), Brooklyn, NY.

ABSTRACT

EVIDENCE OF MICROBIAL COLONIZATION IN THE OROPHARYNX AND DENTAL PLAQUE REDUCES VENTILATOR-ASSOCIATED PNEUMONIA.

BACKGROUND

The oropharynx and teeth reduces contaminated aspirates and subsequent VAP.

METHODS

The reduced system components included a reminder, the oral dental care intervention protocol, and the following: target residents, staff, and patients; establish oral and dental care in patients' medical records; identify colonized patients; establish a dosage of chlorhexidine gluconate 0.12% oral rinse in the patients' mouth for 30 seconds, twice daily; and design a specific oral care protocol consisting of the use of a succion Yankauer catheter to reduce the risk of contaminating the patient environment; a suction dental brush to promote mucosal integrity (q4h). No other interventions were introduced during the study period.

RESULTS

The oral cavity becomes heavily colonized, and poor oral hygiene and lack of mechanical elimination are the main factors leading to proliferation and accumulation of dental plaque on admission and was predictive of subsequent respiratory infection.

CONCLUSION

The authors gratefully acknowledge the critical contribution of the nursing, physician and materials and device departments.

OBJECTIVES

1. Describe the deficits in oral and dental care associated with the development of respiratory infection.
2. Discuss the importance of oral and dental hygiene in the prevention of respiratory infection.
3. Define the role of the interdisciplinary team in the prevention of respiratory infection.
4. Summarize the results of the study.

QUESTIONS TO ADDRESS IN AN EDUCATION HANDOUT ON THE PREVENTION OF VAP.

1. Why is the importance of oral and dental care important?
2. What is the role of the interdisciplinary team in the prevention of respiratory infection?
3. What are the facts about the prevention of respiratory infection?
4. What are the evidence-based approaches to the prevention of respiratory infection?
5. What are the best practices for the prevention of respiratory infection?
6. What are the potential complications of respiratory infection?

TABLE 1

<table>
<thead>
<tr>
<th>Period</th>
<th>Patients</th>
<th>VAP</th>
<th>Ventilator Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 2002-Dec 2003</td>
<td>120</td>
<td>20</td>
<td>6.7%</td>
</tr>
<tr>
<td>Jan 2004-Dec 2005</td>
<td>120</td>
<td>12</td>
<td>4.3%</td>
</tr>
</tbody>
</table>

DISCUSSION

The rates of pneumonia have been observed to be significantly lower in patients who received the new oral and dental care intervention compared to those who did not.

TABLE 2

<table>
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<tr>
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</tbody>
</table>

COST SAVINGS

There are potential cost savings due to the reduced incidence of VAP.

Table 3

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</tbody>
</table>

FIGURE 1

The incidence of nosocomial pneumonia is shown over a period of 12 months.

FIGURE 2

The mean rate of nosocomial pneumonia is shown over a period of 12 months.

FIGURE 3

The incidence of nosocomial pneumonia is shown over a period of 12 months.

FIGURE 4

The incidence of nosocomial pneumonia is shown over a period of 12 months.
REDUCTION OF MICROBIAL COLONIZATION IN THE OROPHARYNX AND DENTAL PLAQUE REDUCES VENTILATOR-ASSOCIATED PNEUMONIA.

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ABSTRACT

BACKGROUND

The effectiveness of oral hygiene measures and mouth care practices in the prevention of ventilator-associated pneumonia (VAP) is unknown. This study was conducted to determine the effectiveness of a comprehensive program of oral and dental health assessment and interventions to reduce VAP among medical intensive care unit (MICU) patients. VAP can have dramatic effects on rates of VAP. Prevention of colonization of these anatomical sites as a means to reduce the occurrence of VAP is strongly recommended. However, practices for which insufficient evidence or strong agreement is lacking are reconsidered and recommendations are updated.

OBJECTIVES

- To determine the effectiveness of a comprehensive program of oral and dental health assessment and interventions in reducing VAP among MICU patients.
- To assess the impact of the program on the cost of VAP and savings.

METHODS

- A retrospective analysis of MICU patients admitted between January 1, 2002, and December 31, 2003, was conducted. The patients were divided into a pre-intervention group (2002) and a post-intervention group (2003).
- Patients were evaluated for VAP using the criteria established by the National Nosocomial Infections Surveillance System (NNIS). VAP cases were defined as pneumonia diagnosed within 48 hours of endotracheal intubation.

RESULTS

- 3000 ventilator days were excluded from the study due to insufficient data.
- VAP prevalence decreased from 87% in the pre-intervention group to 51% in the post-intervention group.
- VAP incidence rate decreased from 75 cases per 1000 ventilator days in the pre-intervention group to 41 cases per 1000 ventilator days in the post-intervention group.

DISCUSSION

- The study demonstrates that the implementation of a comprehensive program addressing the reduction of bacteria that accumulates in the oropharynx and dental plaque can significantly reduce the occurrence of VAP. The program also resulted in significant cost savings for the facility.

CONCLUSION

- The findings support the implementation of a comprehensive program of oral and dental health assessment and interventions to prevent VAP among MICU patients. The program is strongly recommended for implementation and strongly supported by the evidence.

Cost Savings

- The total cost for the 9 avoided cases is calculated to be $360,000. Cost of new product for the 360 cases of VAP in MICU patients in 2003.

Stomach Colonization

- The stomach is the most common site of aerogenic contamination in critically ill patients. Stomach colonization can have dramatic effects on rates of VAP. Prevention of colonization of these anatomical sites as a means to reduce the occurrence of VAP is strongly recommended.