Dental Plaque Linked to Pneumonia in Hospital Patients

Claudia Salwiczek
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Dental plaque in patients’ mouths appears to be a leading cause of pneumonia in hospital patients placed on ventilators, according to research by the University of Buffalo School of Dental Medicine and presented at the International Association of Dental Research on March 23.

“Our study shows that a strong relationship exists between oral and respiratory pathogens in patients with ventilator-associated pneumonia,” says Paul Heo, DDS, a doctoral student in the UB dental school’s Department of Oral Biology and first author on the study.

He explains that the same bacteria identified in dental plaque of patients when they were admitted to intensive care and placed on ventilators were found later in the lungs of those who subsequently developed pneumonia. “We are saying that if the patients’ mouths and teeth aren’t cleaned while they are in the hospital, they may easily develop lung disease.”

The finding is part of a three-year study funded by the National Institute of Dental and Craniofacial Research and headed by Frank A. Scanapieco, DDS, PhD, professor and chair of the department of oral biology. The research is also to determine if swabbing ventilated patients’ mouths with a bactericide can protect them from developing pneumonia.

Nearly 25 percent of patients admitted to intensive care and placed on ventilators develop pneumonia, an infection that can be fatal and generally adds $40,000 in treatment costs and doubles the length of a patient’s hospitalization. He and colleagues concentrated on three strains of suspected pathogens responsible for most hospital-acquired pneumonia: Staphylococcus aureus, Escherichia coli and Pseudomonas aeruginosa.

Samples of plaque from teeth and of secretions from the trachea were obtained from ICU (intensive care unit) patients on the day of admission and every third day thereafter for up to 21 days. Bronchial alveolar lavage samples were also collected from those suspected of having developed pneumonia.

Samples from nine patients who had the pathogens of interest in their plaque and were suspected of having pneumonia were analyzed. Protein and DNA profiles showed that bacteria from tracheal and bronchial samples of the nine patients were identical to bacteria from their dental plaque.