

News Release

# Pathogens in Dental Plaque Implicated in Development of Pneumonia in Hospitalized Elderly

## Better dental hygiene would help prevent respiratory infection

BUFFALO, N.Y. -- Helping nursing home patients brush their teeth or dentures does more than freshen breath, increase comfort and prevent gum disease, a new study has shown.

Good oral health in institutionalized elders may help protect them from contracting potentially deadly pneumonia if they need to be hospitalized, reports a study published in the November issue of the journal *Chest* and conducted by researchers at the University at Buffalo.

Using molecular genotyping, investigators matched respiratory pathogens from the lungs of eight patients who developed hospital-acquired pneumonia with pathogens collected from their dental plaque when they were admitted to the hospital.

"This is the first study to establish unequivocally a link between dental hygiene and respiratory infection," said Ali A. El-Solh, M.D., M.P.H., associate professor of medicine in the UB School of Medicine and Biomedical Sciences and first author on the study.

"Further research is needed to determine the type of therapeutic intervention and the frequency of oral care required to reduce the risk of pneumonia in institutionalized elderly."

Earlier research, including studies conducted at UB, showed that the same types of bacteria commonly found in dental plaque often are present in those with respiratory diseases. However, this investigation is the first to show that pathogens found in a patient's mouth at admission are genetically identical to pathogens found later in lung fluid following a diagnosis of hospital-acquired pneumonia.

The study population was composed of 49 nursing home residents who were admitted to the intensive care unit of Erie County Medical Center, a UB teaching hospital, and required a respirator. The researchers omitted patients who had pneumonia when admitted or who developed pneumonia within 72 hours; had a low platelet count or blood-clotting disorders; had received antibiotic therapy or been hospitalized within the past 60 days; needed immunosuppressive drugs, or had no teeth or dentures.

All study patients were assigned a dental-plaque score following an oral examination, and samples of plaque were collected to determine the types of bacteria present. Of the 49 patients, 28 had respiratory pathogens in their dental plaque samples and 21 did not.

Patients were watched closely for signs of pneumonia. Fourteen patients eventually developed the infection: 10 from the respiratory pathogen group, four from the no-pathogen group.

Fluid samples collected from those with pneumonia were assayed to determine the type of bacteria present. Results showed that of 13 pathogens isolated from lung fluid, nine were a genetic match to those recovered from the plaque of the corresponding patient.

"These findings indicate that dental plaque is a reservoir of respiratory pathogens that can cause pneumonia in hospitalized institutionalized elders," said El-Solh. "We need to investigate the relationship between the burden of dental disease and the incidence of respiratory events.

"In the meantime, nursing homes and other institutions housing frail elderly should be involved actively in improving daily oral hygiene of their residents and enhancing access to dental care," he said.

Additional researchers on the study were Celestino Pietrantonio, D.O., clinical instructor; Abid Bhat, M.D., clinical assistant instructor; Mifue Okada, M.D., visiting scholar from Japan; Alan Aquilina, M.D., clinical professor, and registered nurse Eileen Berbary, all from the Department of Medicine's Division of Pulmonary, Critical Care and Sleep Medicine in the UB medical school, and Joseph Zambon, D.D.S., Ph.D., professor of periodontics and endodontics in the UB School of Dental Medicine.

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The University at Buffalo is a premier research-intensive public university, the largest and most comprehensive campus in the State University of New York.