Assess Dental Plaque and Suction-Extricated Bacteria Adequately

To the Editor:

We read with great interest the recent article in CHEST (August 2009) by Pobo et al1 concerning dental brushing for preventing ventilator-associated pneumonia (VAP). Since dental plaque can serve as a bacterial reservoir2 that may cause VAP, oral care regimens that remove dental plaque could reduce the incidence of VAP. Toothbrushes are generally regarded as the best tools for plaque removal. For example, Fields reported they could drop the VAP rate close to zero by toothbrushing intubated patients every 8 h.3 However, the study by Pobo et al did not demonstrate the effectiveness of electric toothbrushing in addition to standard oral care for the prevention of VAP.

At this stage, we should not conclude that toothbrushing is not necessarily required in oral care for VAP prevention. We would indicate three problems in this study. First, neither dental plaque nor microbial flora was examined between the two groups. As the effectiveness of toothbrushing depends on using toothbrushes in a proper fashion, deposition of dental plaque should be quantified. Second, care regimens in the intervention (toothbrush) group seems to be inadequate. The control group was subjected to a standard oral care regimen where a gauze containing 0.12% chlorhexidine digluconate was applied to teeth, tongue, and mucosal surfaces. Then, 10 mL of chlorhexidine digluconate was injected into the oral cavity, which was then aspirated after 30 s. Besides the intervention described for the control group, toothbrushing was performed, and finally the tongue was also brushed. If the oral care is performed in the author’s order, there is no suction after brushing the teeth and tongue. Therefore, to collect extricated bacteria originally contained in dental plaque by toothbrushing, deep oropharyngeal suctioning after toothbrushing is also essential. Moreover, the incidence of VAP exceeds 20% of the study population, which is high compared to other studies.4 It seems that this number is disputable if the VAP bundle is properly practiced, which should include oral care. Third, in the “Discussion” section the authors stated that a lack of compliance with measures preventing VAP was not checked in their study.5 For these reasons, we expect new trials to be performed under new, precise protocols that should confirm the removal of dental plaque after toothbrushing and the suction of extricated bacteria from the teeth or tongue.

Hiromitsu Kishimoto, DDS, PhD
Masahiro Urade, DDS, PhD
Hyogo, Japan

Affiliations: From the Department of Oral and Maxillofacial Surgery, Hyogo College of Medicine.

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Correspondence to: Hiromitsu Kishimoto, DDS, PhD, Department of Oral and Maxillofacial Surgery, Hyogo College of Medicine, 1-1, Mukogawa-cho, Nishinomiya, Hyogo 663-8501, Japan; e-mail: kishimoto@hyo-med.ac.jp

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REFERENCES

Response

To the Editor:

We thank Dr Kishimoto et al for their interest in our recent article in CHEST (August 2009)6 regarding dental brushing for preventing ventilator-associated pneumonia (VAP). To our knowledge, this is the first study to evaluate the contribution of an intensive oral hygiene protocol using electric toothbrushing to prevent VAP. Our findings suggest that the addition of a mechanical system with electric toothbrushing to standard oral care with chlorhexidine was not effective in preventing VAP. To the best of our knowledge, no universal recommendation regarding the best way to perform oral care in critically ill patients is available. Therefore, we designed an oral care strategy that includes a multidisciplinary approach (including nurses and an oral care expert), and, after a training period for several intensive care nurses, we started performing the technique described in our article. We appreciate Kishimoto et al’s opinion that in the intervention group (0.12% chlorhexidine digluconate every 8 h, plus tooth and tongue brushing every 8 h), after brushing, deep oropharyngeal suction could be done to remove extricated bacteria. We did not do this; instead, we performed an aspiration of the oral cavity. Munro et al6 used a strategy similar to that performed in our study, with similar results. Whether deep oropharyngeal suction after toothbrushing improves our ability to clean up the oral cavity and further reduces the risk of aspiration should be further documented in prospective studies.

We agree that dental plaque and microbial flora are important issues. We assessed the dental plaque and microbial flora from oropharynx quantitatively and qualitatively by collecting oral and pharyngeal swabs of each patient and doing a daily measure of the plaque index score.7 These data will be analyzed in an ongoing substudy.

Finally, we also expect to carry out further studies assessing the effect of toothbrushing on dental plaque colonization and to compare different techniques for oral hygiene performance. It would help us to design the optimal strategy for oral care and its role in VAP prevention.

Angel Pobo, MD
Thiago Lisboa, MD
Bamiro Sole, MD
Jordi Rello, MD, PhD
Tarragona, Spain

Affiliations: From the Critical Care Department (Drs Pobo, Lisboa, and Rello), Joan XXIII University Hospital, University罗vira i Virgili, Institute Pere Virgili (IHPV), CIBER Enfermedades Respiratorias (CIBERES); and the Dentistry Care Department (Dr Sole), Joan XXIII University Hospital, University Roivira i Virgili.

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Correspondence