

Letter

Efficacy of oral chlorhexidine in critical care

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See related review by Jelic *et al.*, <http://ccforum.com/content/12/2/209>

In their review of airway hygiene, Jelic and colleagues highlighted that colonization or infection of the upper airway precedes the development of ventilator-associated pneumonia [1]. Although the effects of chlorhexidine on reducing pneumonia were discussed, there was no mention of the possible contribution of physical plaque removal, in particular tooth brushing, which is often performed either infrequently or inadequately in mechanically ventilated patients [1]. Such removal is important because in critically ill patients the normal microflora of dental plaque becomes rapidly colonized by potential pathogens, and this biofilm serves as a reservoir for the subsequent development of ventilator-associated pneumonia [2,3].

Physical removal of dental plaque is essential for the optimal benefit of chlorhexidine since its primary action is inhibition of plaque formation. Whilst chlorhexidine kills both Gram-negative bacteria and Gram-positive bacteria by damaging

their cell wall, its antiplaque activity is superior to other antiseptics with greater antibacterial activity. This superior activity occurs because chlorhexidine is absorbed onto oral surfaces and is released over a long period of time. This property, known as substantivity, explains why chlorhexidine is excellent at inhibiting plaque formation in a clean mouth but is otherwise of limited efficacy [4]. It is also not generally appreciated that if toothpaste is used prior to chlorhexidine then it must be thoroughly removed to prevent formation of inactive low-solubility salts [5].

Oral chlorhexidine is widely used in critical care practice and has been the subject of many investigations in mechanically ventilated patients. These studies unfortunately do not address the essential need for mechanical cleaning prior to chlorhexidine use and therefore potentially underestimate the benefit of this agent in reducing ventilator-associated pneumonia.

Authors' response

Sanja Jelic, Jennifer A Cunningham and Phillip Factor

We appreciate the interest of Wise and colleagues in our recent paper and agree with their helpful comments. We did not mention the possible contribution of physical dental plaque removal to reducing the incidence of nosocomial pneumonia because no randomized trials addressing this question are

available at present. We agree with Wise and colleagues that studies assessing the effects of mechanical cleaning prior to chlorhexidine application are needed to better define the benefit of this agent in reducing the incidence of nosocomial pneumonia in the intensive care unit.

Competing interests

MPW, JMC, PJF, SJ, JAC and PF declare that they have no competing interests. DWW has previously held a research grant from GlaxoSmithKline. MAL is a consultant for GlaxoSmithKline.

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