Selective digestive decontamination is superior to oropharyngeal chlorhexidine in preventing pneumonia and reducing mortality in critically ill patients

A descontaminação digestiva seletiva é superior à clorexidina via orofaringe na prevenção de pneumonia e na redução da mortalidade em pacientes criticamente enfermos

To the Editor:

We welcome the review article entitled “Nosocomial pneumonia: importance of the oral environment” by Amaral et al., as they unequivocally acknowledge the two fundamentals of pneumonia prevention in patients requiring treatment in the ICU. First, pathogens in the oropharynx cause lower airway infections, and second, eradication of oropharyngeal pathogens prevents lower airway infections. The authors advocate pharmacological interventions to prevent pneumonia, including “decontamination with the administration of systemic antibiotics” and “local decontamination with the topical use of oral antiseptic and toothbrushing”. We were surprised by the ready dismissal of the issue of selective digestive decontamination (SDD), since the authors cited only one randomized controlled trial (RCT) using oropharyngeal decontamination with 2% gentamicin, polymyxin B and vancomycin, whereas the use of chlorhexidine was widely supported.

The issue of SDD has been addressed in 60 RCTs and 10 meta-analyses including only RCTs (Chart 1). In all meta-analyses in which pneumonia was the endpoint, SDD using parenteral, as well as enteral (oropharyngeal and intestinal), antimicrobials has consistently been shown to reduce the number of cases of pneumonia. The parenteral component effectively controls primary endogenous pneumonias caused by “normal” bacteria, whereas the enteral antimicrobials reduce secondary endogenous pneumonias due to “abnormal” bacteria, including Pseudomonas spp. and Acinetobacter spp. Although the authors are concerned about Actinomyces spp., this microorganism cannot be considered to be among the potential agents of pneumonia in mechanically ventilated ICU patients. Nevertheless, Actinomyces spp. are covered by the SDD antimicrobials. In 8 of the 10 meta-analyses, mortality was the outcome measure. There was a consistent survival benefit in all meta-analyses that assessed the full SDD protocol with parenteral and enteral antimicrobials, assuming that the sample size was sufficient. Opinion leaders have expressed concerns regarding resistance, and, despite the fact that those concerns are based on low level evidence, this has hindered the implementation of SDD. Resistance was not a clinically relevant problem in the 60 RCTs evaluating SDD. Two large Dutch RCTs in which the endpoint was resistance demonstrated that the carriage of and infection with multiresistant aerobic gram-negative bacilli were significantly lower after SDD than after the standard therapy.

The use of selective oropharyngeal decontamination (SOD) alone, rather than the full SDD protocol, has recently been advocated. However, a recent meta-analysis demonstrated that SOD significantly reduces lower respiratory tract infections but does not reduce mortality.

In their review, Amaral et al. focused most of their attention on the role that the oropharyngeal application of antiseptics, mainly chlorhexidine, plays in the prevention of ventilator-associated pneumonia (VAP). This preventive policy has been studied in several RCTs, with opposite results. To our knowledge, there have been only 5 meta-analyses of oral antiseptics, the majority of which concluded that oral antiseptics seem to be effective in reducing VAP. However, results from RCTs of oral antiseptics and from meta-analyses should be interpreted with caution. Two thirds of the population included in the meta-analyses were cardiac surgery patients who had received no more than two days of mechanical ventilation. Such patients should not be included in a meta-analysis in which the endpoint is VAP. In addition, the differences in terms of the definition of lower respiratory tract infections, as well as in the dosages and applications of antiseptics (e.g., chlorhexidine vs. povidone iodine; 0.12% vs. 2% chlorhexidine; use of solution, spray, gel or paste), might have influenced the results. In summary, it seems that oral antiseptics are...
effective in preventing lower respiratory tract infection only in patients who receive mechanical ventilation for 48 h or less. The question of whether oral antiseptics are useful in preventing late-onset VAP requires further investigation. Furthermore, oral antiseptics have not been shown to significantly reduce mortality.

We believe SDD to be the only strategy that is associated with a survival benefit. We wonder why these authors chose to ignore this intervention in their review.

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References

The use of SDD in other hospital-acquired infections. In addition, there is no hard evidence that SDD effectively reduces or controls oral biofilm formation, or that it even inhibits the colonization of pathogens protected by biofilms in the oral and dental environment. It is also of note that ventilator-associated oral dryness predisposes to the colonization of pathogens on the oral surfaces, especially on the dorsum of the tongue. Data in the dental and periodontal literature clearly demonstrate that, in these situations, only local approaches, including mechanical and chemical measures (e.g., chlorhexidine solution and gel) are capable of controlling bacterial colonization, since they inhibit the establishment of oral and dental biofilms as reservoirs for potential oral and respiratory pathogens. Similarly, patients presenting uncontrolled periodontal disease, a known risk group for VAP, should also essentially be managed through the use of mechanical and chemical measures.

The suggestion of the use of a protocol including oral rinsing with chlorhexidine to decrease the incidence of nosocomial pneumonia—and as an (albeit unproven) means of reducing the related mortality—is not meant to be exclusive. It could be combined with other local, systemic, enteral and parenteral protocols, since it seems...