Glycine: New dimension in subgingival biofilm removal

By Juliette Reeves

Air polishing no longer limited to only supragingival application

The removal of biofilm deposits from within the periodontal pocket is recognized as being fundamental in reducing bacterial burden and down regulating the pro-inflammatory response in the treatment of the periodontal diseases. Recolonization of the periodontal pocket by pathogenic bacteria, however, occurs within weeks of initial phase therapy making continuous and regular subgingival biofilm removal a prerequisite in the successful management of periodontal disease.

Repeated intervention, however, is not without disadvantages in that a fine balance exists between root surface debridement and disturbance of the epithelial attachment with loss of root substance. Repeated use of traditional methods (hand scalers, curettes, sonic and ultrasonic scalers) can result in significant loss of root substance and surface smoothness, limiting the frequency of such intervention.

Until now, air polishing has been indicated for only supragingival application. With the advent of a glycine-based prophylaxis powder designed for subgingival use, a new dimension in the removal of subgingival plaque and biofilm deposits has arrived.

Air polishing

Surprisingly, air polishing is not a new technology. It’s been used for almost 50 years. In contrast to air-abrasive techniques, air polishing employs a mixture of air, powder and water. This fine jet is directed toward the tooth surface at an air pressure of 4–8 bar and a water pressure of 1–3 bar, leading to the removal of surface deposits.

Until now, the powder of choice has been sodium bicarbonate (NaCOH3), however, with a particle size of 100–200 μm (micromillimeters), it has proven too abrasive for subgingival application. Compared with conventional instrumentation, NaCOH3 is more effective in the supragingival removal of plaque deposits and extrinsic staining; however, because of its high abrasive quality, it is contraindicated for root surface application and subgingival deposits.

Abrasion of dental tissues

Intact enamel surfaces appear not to be significantly affected by NaCOH3 air polishing techniques; however, pits and fissures may be abraded more quickly and easily. Enamel surfaces subjected to significant plaque colonization and areas of demineralization (white spots) appear to be particularly affected.

Root surfaces (enamel and root dentine) are lower in hardness compared with enamel, and therefore the removal of subgingival plaque deposits with NaCOH3 results in substantial wear of the root surface. In vitro experiments on root surfaces have shown significant defects of more than 600 μm following air polishing with NaCOH3.

Histological evaluation of the epithelium, epithelial layers and base membrane of the periodontal pocket have shown significant disruption of epithelial cells with loss of basal membrane following either hand scaling or NaCOH3 in the removal of subgingival plaque and associated microorganisms.

While NaCOH3 application is a useful and efficient way of removing plaque and biofilm deposits from supragingival enamel surfaces, it is therefore not indicated in the disinfection and maintenance of the periodontal pocket.

Glycine

Glycine is a non-essential amino acid with one of the simplest structures of all the amino acids. Glycine is found in proteins of all life forms, and is involved in the synthesis of proteins as well as adenosine triphosphate (ATP). Glycine is water soluble, has a molar mass of 75.07 g/mol and is packed with nutrition and is involved in metabolism in the cell. Glycine is also used in internal medicine as an anabolic agent and for the treatment of a number of disorders.

A large number of glycine receptors have been identified both in the brain and peripheral nervous system. These receptors are involved in the regulation of muscle tone, motility, stress, bone density and female hormones. Reeves lives in an 18th-century village on the outskirts of Peterborough, Great Britain, with her husband, Graham. Visit her website at www.geno-nutrition.com and contact her by email at info@geno-nutrition.com.

Grant supports nursing-home oral health

‘Pros in Profession’ winner to use $5,000 from Crest Oral-B to train care staffs

Crest® Oral-B® has awarded Ann Benson Ross, RDH, BS, of Phoenix, the brands’ first-ever Pros in the Profession® grant for “Advancing Oral Health in the Community.” Together with her fellow staff at Mobile Dentistry of Arizona, Ross plans to use the $5,000 grant toward delivering onsite oral health services to nursing home residents who are in critical need of care but unable to obtain such services. Because of financial reasons, physical immobility of patients and lack of proper training among staff, oral health care tends to lag behind other forms of care in nursing homes.

To continue supporting the work that the Pros in the Profession year-one winners are doing in their communities, Crest Oral-B called for grant proposals from these dental hygienists earlier this year. Each unique application centered on a common theme and outlined ways in which the $5,000 funds would be used to improve the state of oral health within each winner’s community. Ross was selected based on her compelling demonstration of the urgent need for financial support to help bring oral health care to nursing home residents who are at a clear disadvantage in her community.

“It is estimated that only 50 percent of people with a significant disability are able to find access to professional dental care,” Ross said. “At Mobile Dentistry of Arizona, it is our priority to close this oral health gap in our community’s nursing homes by bringing dental care access to residents with mobility challenges — a mission that is greatly enhanced and supported with the help of the Crest Oral-B grant.”

Ross’ goals through the grant are two-fold: Along with delivering oral health services to nursing home residents, her team will provide the necessary training for nursing home staff to continue to help maintain residents’ oral health care routine, including assistance with brushing and flossing.

‘Crest Oral-B is proud of dental hygienists like Ann who are truly making an impact in patients’ lives, and we are committed to helping further their impact on oral health beyond their daily practice,” said P&G Dental Hygienist Relations Manager Wendy Bebey, RDH, BS. “We are excited to continue our partnership with Ann through the Pros in the Profession grant and provide her with the means to help fulfill our joint-mission of Advancing Oral Health in the Community.”

The Crest Oral-B Pros in the Profession program recognizes registered dental hygienists who go above and beyond the call of duty every day. Throughout the year, Crest Oral-B rewards a selection of deserving professionals, as nominated by their peers, who truly make an impact on patients and the oral health cause. To learn more about the program, you can visit www.prosintheprofession.com. For information about Crest Oral-B products and resources, visit www.dentaicare.com.

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(Source: Crest Oral-B)
Glycine has been shown to be highly effective in plaque removal and microbiological evaluation. A recent study by Sbarbante et al. [1] demonstrated that glycine powder produced a similar degree of tooth surface roughness as hand instrumentation. The use of glycine powder has been shown to cause significant improvements in patient comfort and satisfaction.[2] Moreover, it has been noted that patient acceptance of glycine air polishing is widely accepted by patients.[3]

The use of conventional NaCO3 air polishing has been shown to cause significant enamel wear and root surface loss over time.[4] In contrast, glycine air polishing has been shown to produce less wear and root surface loss compared to conventional NaCO3 air polishing.[5] A recent study by Petersilka et al. [6] demonstrated that glycine air polishing produced less root surface loss and less enamel wear compared to conventional NaCO3 air polishing.

Patient acceptance is a crucial factor in the success of dental procedures. In a study by Bowers et al. [7] patients rated glycine air polishing as more acceptable than conventional NaCO3 air polishing. The use of glycine air polishing has been shown to lead to root surface loss over time.[8] However, a recent study by Petersilka et al. [9] demonstrated that glycine air polishing produced less root surface loss compared to conventional NaCO3 air polishing.

Glycine has been shown to be highly effective in calculus removal. A recent study by Boyde et al. [10] demonstrated that glycine air polishing produced a similar degree of calculus removal as hand instrumentation. The use of glycine powder has been shown to cause significant improvements in patient comfort and satisfaction.[11] Moreover, it has been noted that patient acceptance of glycine air polishing is widely accepted by patients.[12]

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