Glycine: New dimension in subgingival biofilm removal

Air polishing no longer limited to only supragingival application

By Juliette Reeves

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.1

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,2,3 thus 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.5 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 1–5 bar,6 leading to the removal of surface deposits. Until now, the powder of choice has been sodium bicarbonate (NaCO3H3), however, with a particle size of 100–200 μm (micrometers), it has proven too abrasive for subgingival application. Compared with conventional instrumentation, NaCO3H3 is more effective in the supragingival removal of plaque deposits and extrinsic staining; however, because of its high abrasive quality, it is contra-indicated for root surface application and subgingival deposits.8

Abrasion of dental tissues

Intact enamel surfaces appear not to be significantly affected by NaCO3H3 air polishing techniques; however, pits and fissures may appear to be abraded more quickly and easily. Enamel surfaces subjected to significant plaque colonization and areas of demineralization (white spots) appear to be particularly affected.9

Root surfaces (cementum and root dentine) are lower in hardness compared with enamel, and therefore the removal of subgingival plaque deposits with NaCO3H3 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 NaCO3H3.10 Histological evaluation of the epithelium, epithelial layers and base membrane of the periodontal pocket have shown significant disruption of epithelial and connective tissue, bone density and female hormones.

While NaCO3H3 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 important in the synthesis of proteins as well as adenosine triphosphate (ATP). Glycine is water soluble, has a

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’s 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.dentalcare.com.

(Source: Crest Oral-B)
naturally sweet taste and is completely bio-
resistant to root dentine and cementum. When
air-polishing with air-powder systems (NaCOH3) are highly abra-
sive to root dentine and cementum. When
air-polishing systems with hand instruments and
air-powder compared with hand instrumenta-
tion (curetes). No adverse effects were re-
ported in the test group, with patients per-
ceiving less pain than the hand-instrument
(69 versus 2.2 on a scale of 1–10). Treatment in the test group was also
completed three times more quickly than the hand group, with comparable microbial reductive.

Conclusion
Subgingival debridement is considered es-
tential in treating periodontitis and has
been shown to be pivotal in arresting dis-
ease progression.34 Biofilm formation oc-
curs rapidly in periodontal pockets follow-
ing toothbrushing and particularly in sites
of pathogenic microbial flora occurs after a
few months following treatment.35 indicat-
ing frequent maintenance is required.

Reduction and repeated debridement of root surfaces with hand instruments and
or sonic/ultrasonic instruments has been
shown to lead to root surface loss over time.36 plaque. Repeated debridement can be
accomplished effectively with air-polishing
devices with little or no abrasive effects.
However, this method is not indicated for
root surfaces, because conventional air-
powdering (NaCOH3) are highly abra-
sive to root dentine and cementum. When
repeatedly performed during maintenance
therapies, this cleaning method can incur
inflammatory reactivity which may become clinically significant.
The advent of a new glycine-based pow-
der for use with air-polishing devices has
been shown to be suitable for root surface
debridement, causing little or no surface
loss, tissue trauma or patient discomfort.
Reduction in pathogenic microbial–colony-
forming units is greater than with hand in-
strumentation and is achieved in less time,
with less operator fatigue and with greater
patient comfort and compliance.
Preoperative measurements for patients with upper respiratory tract conditions
remain the same as with conventional air-
polishing powders, however, since glycine
less abrasive than sodium bicarbonate in 2003, studies34–36 have been reported, making it an effective method of removing subgingival biofilm from the root surfaces and disruption of the periodontal pocket

Considering the high level of patient ac-
ceptance, biocompatibility and efficacy, the
use of glycine powder for biofilm removal
may greatly enhance the success of period-
onal maintenance therapy and has the potential
to offer significant benefits in the supportive care of the periodontal patient.

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