



SMART DENTAL UPDATES

Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you “**SMART DENTAL UPDATES**” which contains latest and interesting news in the field of Dentistry.

This issue contains

- Role of Antibacterial and remineralizing nanocomposite on root caries biofilms
- Effectiveness of oral moisturizing gel and flavor on oral moisture and saliva volume
- Short-Term Impact of Non-Surgical and Surgical Periodontal Therapy on Oral Health-Related QoL

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Limited

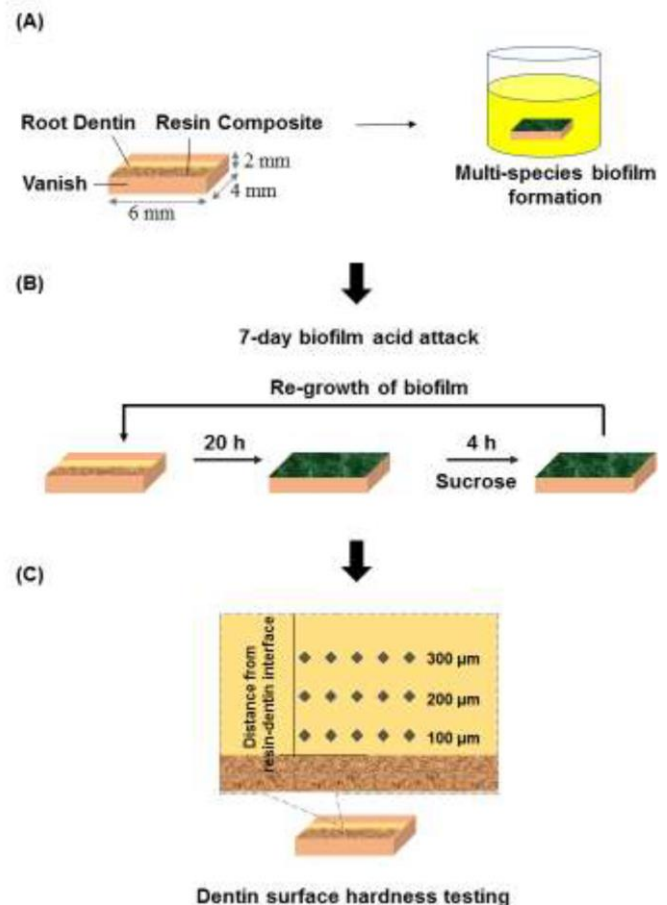
Role of Antibacterial and remineralizing nanocomposite on root caries biofilms

The root caries has become a significant health issue worldwide. The elderly population experiences an increased incidence of gingival recession and root exposure. Current resin-based restorations lack the ability to inhibit biofilm growth, and may accumulate more biofilms and plaque than other restorative materials such as metals and amalgam.

The novel NACP + DMAHDM nanocomposite has strong antibacterial effects

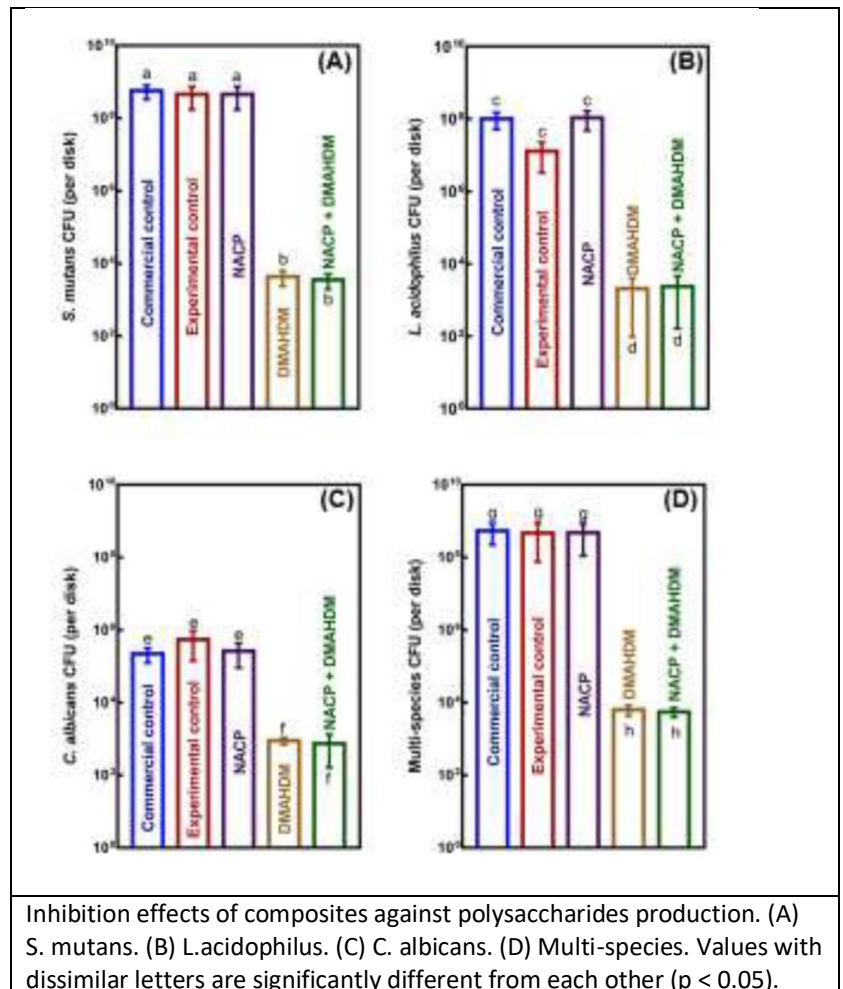
The objectives of this study were to: (1) develop a bioactive composite with calcium (Ca) and phosphate (P) ion-release and antibacterial capabilities via nanoparticles of amorphous calcium phosphate (NACP) and dimethylaminohexadecyl methacrylate (DMAHDM); (2) inhibit root biofilms of *Streptococcus mutans*, *Lactobacillus acidophilus* and *Candida albicans* in a biofilm-based recurrent root caries model to protect root dentin hardness under biofilms for the first time.

Five groups were tested: (1) Heliomolar nanocomposite (Commercial control); (2) Experimental composite control (0% NACP, 0% DMAHDM); (3) Remineralizing composite (30% NACP); (4) Antibacterial composite (3% DMAHDM); (5) Remineralizing and antibacterial composite (NACP + DMAHDM). Colony-forming units (CFU), lactic acid and polysaccharide of biofilms were evaluated.



Demineralization of bovine root dentin with restorations was induced via multi-species biofilms, and root dentin hardness was measured.

Adding NACP and DMAHDM into composite did not compromise the mechanical properties ($p > 0.05$). Biofilm lactic acid, polysaccharides and CFU were greatly reduced via DMAHDM ($p < 0.05$). Ca and P ion releases were substantially increased at cariogenic low pH. With multi-species biofilm acid attack, root dentin hardness (GPa) decreased to 0.12 ± 0.03 for Commercial control, and 0.11 ± 0.03 for Experimental control. Root dentin hardness was 0.20 ± 0.04 for NACP group, 0.21 ± 0.04 for DMAHDM group, and 0.30 ± 0.03 for NACP + DMAHDM group which was more than 2-fold that of control groups ($p < 0.05$).



The novel NACP + DMAHDM nanocomposite has strong antibacterial effects and Ca and P ion release. When tested in a multi-species recurrent root caries model, NACP + DMAHDM nanocomposite substantially reduced root dentin demineralization and protected dentin hardness around the restorations under biofilms. Therefore, this novel bioactive composite is promising to inhibit root caries and protect tooth structures.

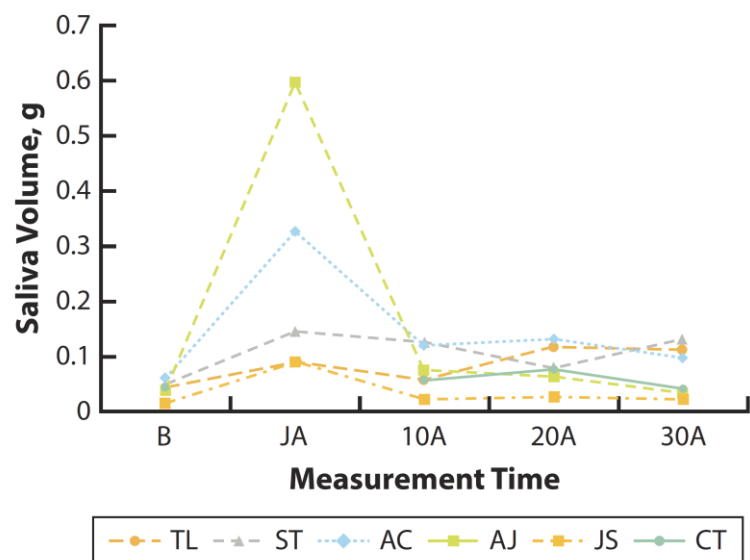
Source: Zhou W et al. J Dentistry. 2020 June; 97:103344.
doi.org/10.1016/j.jdent.2020.103344

Effectiveness of oral moisturizing gel and flavor on oral moisture and saliva volume

Many older dental patients complain of oral dryness, which can lead to problems in the oral cavity and pharynx, including caries, periodontal disease, mucosal infection, difficulty speaking, difficulty swallowing, and problems with dental prostheses. Moisturizing agents, including mouthwashes, dentifrices, mouth sprays, and oral gels, have been used to relieve the symptoms caused by oral dryness and to treat oral dryness. The purpose of this clinical study was to examine the effectiveness of moisturizing gels with different flavors.

The effectiveness of moisturizing gel for increasing saliva secretion differed according to the flavor of the moisturizing gel

Participants in this study consisted of 36 healthy adults and 20 individuals with oral dryness. They were randomly divided into 6 groups, and moisturizing gels with 5 different flavors (tasteless and odorless, sweet taste, acid taste with citric acid, acid taste with Japanese apricot extract, and Japanese apricot scent) were tested in 5 of the groups with 1 group acting as the control (no gel administered). Oral moisture and saliva volume were measured before applying the moisturizing gel, just after applying the moisturizing gel, and 10, 20, and 30 minutes after applying the moisturizing gel.



Saliva volume before, just after, and 10, 20, and 30 minutes after applying moisturizing gel. Measurements expressed as mean values. TL, tasteless and odorless; ST, sweet taste; AC, acid taste with citric acid; AJ, acid taste with Japanese apricot extract; JS, Japanese apricot scent; CT, control. B, before applying moisturizing gel; JA, just after applying moisturizing gel; 10A, 10 minutes after applying moisturizing gel; 20A, 20 minutes after applying moisturizing gel; 30A, 30 minutes after applying moisturizing gel.

Differences in oral moisture and saliva volume according to the gel flavor and duration of contact were analyzed by using 2-way analysis of variance ($\alpha=.05$).

Oral moisture did not differ among the gel flavors and the duration of contact. Saliva volume in the control (no gel administered) reported no statistically significant differences among any of the contact durations in both healthy adults and participants with oral dryness. The saliva volume in healthy adults increased after using the sweet taste ($P=.012$), acid taste with Japanese apricot extract ($P=.006$), and Japanese apricot scent ($P=.005$) moisturizing gels. The saliva volume in participants with oral dryness increased rapidly just after using the acid taste with Japanese apricot extract gel ($P=.008$) and increased slowly after applying the tasteless and odorless ($P=.046$), sweet taste ($P=.048$), and acid taste with citric acid moisturizing gels ($P=.010$).

The effectiveness of moisturizing gel for increasing saliva secretion differed according to the flavor of the moisturizing gel. This suggests that the moisturizing gel's effect on increasing saliva secretion is related to the flavor of the gel in addition to the moisturizing agent.

Source: Mizuhashi F et al. J Prosthet Dent 2020; <https://doi.org/10.1016/j.prosdent.2020.02.031>

Short-Term Impact of Non-Surgical and Surgical Periodontal Therapy on Oral Health-Related Quality of Life

During the last decades, research on periodontal health and pathology has been based on a biomedical approach to disease. The clinical signs of chronic periodontitis, such as clinical attachment loss, probing pocket depth and bleeding on probing have been overemphasized by the clinicians, as they provide evidence on both disease severity and effectiveness of periodontal therapy but offer little insight into more subjective patient-based outcomes, such as quality of life.

While periodontitis deteriorates patients' quality of life, non-surgical periodontal treatment seems to offer an improvement. The purpose of the present study was to evaluate the impact of non-surgical and surgical periodontal treatment on the oral health-related quality of life (OHRQoL) utilizing patient-centered assessments and surrogate clinical measurements in Greek adults.

Non-surgical periodontal treatment seemed to improve OHRQoL in terms of OHIP-14 scores

Eighty-three individuals with chronic periodontitis were enrolled in the study. Assessment of OHRQoL with the use of the Oral Health Impact Profile (OHIP-14) questionnaire in conjunction with clinical measurements of pocket probing depth (PPD), plaque index (PI) and bleeding on probing (BOP) were performed at baseline (t0), after non-surgical therapy (t1) and after periodontal surgery (t2).

OHIP-14		Min	Median	Max	Mean *	SD **	N
Functional limitation	F1 (t0)	0	2	8	2.7 a	2.2	75
	F1 (t1)	0	2	7	1.6 b	1.4	75
	F1 (t2)	0	1	7	1.5 b	1.7	31
Physical pain	F2 (t0)	0	3	8	3.6 a	2.0	75
	F2 (t1)	0	2	7	2.5 b	1.5	75
	F2 (t2)	0	2	5	2.2 b	1.2	31
psychological discomfort	F3 (t0)	0	1	7	1.7 a	1.9	75
	F3 (t1)	0	1	4	1.0 b	1.1	75
	F3 (t2)	0	1	4	1.0 b	1.1	31
Physical disability	F4 (t0)	0	3	7	2.7 a	1.8	75
	F4 (t1)	0	2	5	2.1 b	1.5	75
	F4 (t2)	0	1	7	1.8 b	1.8	31
Psychological disability	F5 (t0)	0	2	8	2.2 a	1.9	75
	F5 (t1)	0	1	7	1.3 b	1.4	75
	F5 (t2)	0	1	4	1.3 b	1.0	31
Social disability	F6 (t0)	0	0	6	0.9 a	1.9	75
	F6 (t1)	0	0	4	0.7 a	1.4	75
	F6 (t2)	0	0	2	0.5 a	1.0	31
Handicap	F7 (t0)	0	2	7	2.3 a	1.7	75
	F7 (t1)	0	1	7	1.6 b	1.4	75
	F7 (t2)	0	1	6	1.3 b	1.4	31

Descriptive statistical indices and comparisons of the total scores of the seven dimensions of the OHIP-14 questionnaire at baseline (t0), at phase I (t1) and at phase II (t2) of the study

A statistically significant reduction of OHIP-14 score was recorded at t1 and t2 examination compared to baseline ($p < 0.001$) and a statistically significant improvement in all clinical parameter at all time points was recorded ($p < 0.05$). No correlation between the clinical parameters and the total score of OHIP-14 was recorded at any time point.

Non-surgical periodontal treatment seemed to improve OHRQoL in terms of OHIP-14 scores, whilst supplementary surgical periodontal therapy did not offer any additional benefit. No correlation was found between patients' perception of quality of life expressed by OHIP-14 score and the surrogate clinical parameters.

Source: Theodoridis C et al. Dent. J. 2020, 8, 54. doi:10.3390/dj8020054



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