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Professor Nicola X. West is a graduate of the University of Wales College of Medicine (Cardiff). After attaining her fellowship from the Royal College of Surgeons of England, she was awarded her PhD from the University of Wales (Cardiff) in 1995, on dentine hypersensitivity and tooth surface loss. She gained her chair in Periodontology at Bristol Dental School, where she conducts research, leading the Clinical Trials Unit and attracting substantial industrial funding. She is also an Honorary Consultant in Restorative Dentistry. She has established a reputation for aesthetic treatment of complex restorative cases involving periodontal, implant and prosthodontic treatment. She lectures regularly in the national and international forum. She is the Secretary General of the European Federation of Periodontology and President elect of the British Society of Periodontology. She also runs a thriving specialist practice in Bristol, UK.

Efficacy of an aluminium lactate/potassium nitrate/hydroxyapatite toothpaste compared to a potassium nitrate toothpaste for the treatment of dentine hypersensitivity

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Background

Dentine hypersensitivity (DH) is a common oral pain condition, arising when dentine is exposed by tooth wear or gingival recession, a recent systematic review reporting an average prevalence of 42%. A short, sharp, arresting pain is experienced when patent dentine tubules are exposed to stimuli such as cold food and drink, eliciting the movement of fluid within the tubules and triggering a pulpal nerve response and dental pain. Although DH pain is usually transient it can be intense and has been shown to have a negative impact on quality of life. Treatment acts to depolarise the nerves and or block the dentine tubules, being professionally administered or over the counter. Over the counter treatment are convenient and simple to use however and many formulations show efficacy compared to negative controls, however evidence from systematic reviews shows there is no 'gold standard' treatment. This study aimed to test the efficacy of an experimental toothpaste containing potassium nitrate, aluminium lactate and hydroxyapatite to reduce DH pain as compared to a potassium nitrate control toothpaste.

Methods

This was a randomised, examiner blind, two treatment arm, parallel, stratified, controlled trial in adult participants with DH. After a 7-day wash-in period participants with 2 sensitive teeth (Schiff >2) were randomised to test or control toothpaste. DH of the selected study teeth was assessed by tactile stimuli with a Yeaple probe, Schiff score following a drop of water at 0 ℃ and VAS on global DH, at baseline pre and post supervised brushing and after 7 and 14 days of product use. DH quality of life and a full mouth Turesky plaque score were also completed at these visits.

Results

82 participants were randomised and completed the study. There was an improvement in DH pain scores in both groups, but improvements were much greater in those receiving the test toothpaste with pain reduced significantly more than those using the control toothpaste at all time points for all DH measures ($p = 0.005$). Furthermore, using the test as opposed to the control toothpaste resulted in a significant relative risk reduction (RRR) of DH pain of 55% immediately post supervised toothbrushing rising to 81% after 7 and 88.6% after 14 days ($p<0.001$). Mean quality of life scores improved slightly overall from baseline to visit 4 in both groups, however, there were no significant differences between them comparing the overall score or for any individual questions. Similarly, there was no significant difference in global VAS score reported by the participants in the test and control groups although scores favoured the test toothpaste. Plaque scores were also similar for both toothpastes at all time points.

Conclusion

The experimental toothpaste containing potassium nitrate, aluminium lactate and hydroxyapatite is effective at reducing DH pain immediately after treatment and for up to 14 days, providing significantly more pain relief than the benchmark control potassium nitrate control toothpaste.