Development of a Facile Method to Rebalance Oral Environment: Oral pH 7 Rebalancer

Brian Chung¹, Jong Hyun Im¹, Ji Young Kim¹, Wonho Ha²

¹Global Oral Health Lab, LG H&H Research Center, Seoul, Korea, ²Oral Health R&D Division, LG H&H Research Center, Seoul, Korea

Objective: We investigated whether a new chew-swish-swallow mouth refreshener, LG pH 7 Rebalancer tablet could control a drop in salivary pH and therefore improve the pH rebalancing potential of saliva after an acidic challenge such as a glucose rinse and high sugar foods by *in-vivo* and *in-vitro* studies.

Methods: Neutralized salivary pH after an acidic challenge was studied by *in-vivo* and *in-vitro*. For *in-vivo* study, participants were recruited for two visits, every morning for two days. At day 1, the baseline salivary pH of participants was measured and then rinsed with a 10% glucose solution for one minute as an acidic challenge. Their salivary pH was monitored at several time points for 60 minutes. At day 2, the same participants rinsed with a 10% glucose solution for one minute after checking the baseline pH of their saliva. Participants then were instructed to use a tablet (LG pH 7 rebalance) for 10 sec chewing and for 30 sec swishing and swallowed. The pH of saliva was measured immediately and at the same time points to 60 minutes. The pH rebalancing ability of the tablet was evaluated by comparing the two day studies. For *in-vitro* study, acid creation model was used: *Streptococcus mutans* (*S. mutans*) and high sugar containing food were dissolved in artificial saliva. The pH change upon the application of the tablet was measured at minute's interval to an overnight time periods.

Results: In all participants, the one minute rinse with 10% glucose solution resulted in a period of acidic pH, and the use of LG pH 7 rebalance tablet neutralized and substantially reduced the period time the pH maintained lower than 6.0. The average time period that the salivary pH was maintained acidic pH after the 10% glucose rinse was longer than 5 minutes. When the tablet was also used, the time for elevating pH was less than one minute. The *in-vitro* study also showed similar results: high sugar containing foods lowered the artificial saliva pH with *S. mutans* and rapid recovery of pH after taking the tablet was observed.

Conclusion: The use of a newly developed LG pH 7 Rebalancer tablet was shown drastic increase of the pH to control the lowering of salivary pH following carbohydrate consumption from both *in-vivo* and *in-vitro* studies. Since numerous metabolic activity of the bacteria associated with the oral disease development results symptoms of low pH, the new invention in this study potentially an alternative approach in prevention and treatment of periodontal diseases, caries and dental erosion.

Keywords: pH rebalancer, saliva, pH neutralizing, mouth refreshener