Evaluation of oral mucin secretion and pH neutralization by tablet application “Oral pH 7 Rebalancer”

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Objective: The aim of this study is to evaluate the efficacy of the chewable LG pH 7 Rebalancer[®] oral tablet to improve oral environments including maintenance of a neutral oral pH and promotion of oral mucin secretion *in-vivo*.

Method: Oral pH and mucin contents were measured before and after LG pH 7 Rebalancer[®] application. LG pH 7 Rebalancer[®] contained sodium bicarbonate and tetrasodium pyrophosphate. Alteration in pH of saliva and recovery of total oral mucin were evaluated by saliva samples which were collected in each time points. In this study, we measured acidity of saliva using pH-dependent colorimetric assay and total mucin content of saliva using enzyme-linked lectin assay (ELLA). Saliva samples were collected and centrifuged in 13,000 rpm for 10 minutes. Supernatant were collected and reacted with pH indicator in 96-well plate. After 5 minutes of plate shaking, spectral absorbance was measured from 200 to 1000 nm. Individual oral saliva pH was determined comparing with pH standards (pH 4–pH 10). Oral mucin ELLA assays were performed by using wheat germ agglutinin and HRP-conjugated soybean agglutinin. Total mucin concentrations in saliva samples were determined by comparison with bovine mucin standards.

Result: All participants were divided in 3 groups by oral acidity (acidic/ neutral/ basic groups). After LG pH 7 Rebalancer[®] intake, oral pH was immediately increased higher to 7.81 comparing to 7.6 of Listerine[®] Ready! Tabs[™]. Unlike Listerine ready tabs[®] which was totally recovered initial oral pH (6.86 to 6.84) in 30 minutes, LG pH 7 Rebalancer[®] maintained higher pH (6.82 to 7.12) than initial pH after 30 minutes. Especially, in lower pH participants who had experienced periodontitis and cavities, neutral oral pH maintaining effects were more long-lasting comparing to Listerine ready tabs. In addition, the total mucin contents were higher in saliva after using LG pH 7 Rebalancer[®] than Listerine ready tabs[®]. After 30 minutes, LG pH 7 Rebalancer[®] group showed 1.5 fold higher mucin contents in saliva compared to Listerine ready tabs[®] groups, which showed lower the level of total mucin compared to saliva before intake. Furthermore, we found the increment of mucin secretion had a negative correlation with the decrement in pH of saliva. ($R = -0.81$).

Conclusion: Dental caries and periodontitis are related to oral environment. In particular, oral saliva plays the important role in maintaining oral health. Our results showed that LG pH 7 Rebalancer[®] could regulate the acidity of saliva and the secretion of total oral mucin. In conclusion, LG pH 7 Rebalancer[®] could improve oral health through regulating of oral environment.

Keywords: pH Rebalancer, oral pH, saliva, mucin