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A novel application of nano eggshell/titanium dioxide composite on occluding dentine tubules: An *in vitro* study

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The present study is the report of the remineralization potential of a novel eggshell-titanium dioxide (EB-TiO₂) composite in occluding opened dentine tubules. EB-TiO₂ was synthesized through balling milling process. Nine prepared dentine tooth were treated with EB-TiO₂. The dentine tooth was agitated in 1wt% citric acid for 30 min to simulate sensitive tooth. Each specimen was then subjected to remineralization protocol. Scanning Electron Microscope (SEM) was used to characterize the dentine surfaces pre-post-treatment and post-acid exposure. In addition energy dispersive spectroscopy was used to analyze the elemental composition of the occluded tubules. Notable differences were observed in the remineralization characteristics pre-post-treatment. The SEM images show that EB-TiO₂ effectively occluded the tubules. The occluded tubules in the EB-TiO₂ samples remain intact post acidic exposure. The EDX results revealed the presence of calcium, phosphorus, oxygen, carbon and titanium in the occluded tubules. The salient features of this study suggest that EB-TiO₂ can effectively remineralise exposed dentine tubules while remaining effective in acidic environment.

Biography

Stanley C Onwubu has completed his Graduation and his Masters at the Durban University of Technology in 2016. He is currently pursuing his PhD at Durban University of Technology. He has published articles and book chapters in reputed journals. He has passion in the development of new dental materials from recycled materials. He has previously worked on a new abrasive material using waste eggshells for polishing poly methyl methacrylate resin dentures. His current doctoral research focuses on remineralization of damaged teeth using nano-sized titanium dioxide modified eggshell powder with a view of developing a mathematical model to predict dentine remineralization.

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