Material Retention – An Invalid Clinical Criterion For Dental Pit And Fissure Sealants Efficacy

SYSTEM Initiative: In-depth evaluation of clinical evidence indicates that material retention is an invalid criterion for fissure sealant efficacy.

Johannesburg, South Africa (PRWEB) October 09, 2014 -- Clinical evidence is now available that questions the use of ‘material retention’ as the current ruling criterion for quality of placed pit and fissure sealants.

A systematic search of the dental literature found 95 clinical trials that investigated the retention rate and subsequent caries occurrence on resin-sealed teeth. Based on the combined data of these trials the caries predictive power of losing resin material in pit and fissures was statistically compared to the predictive power of mere random guesses. No significant difference beyond the play of chance was found, thus sealant retention loss appeared not to be a valid predictor for clinical outcome.

Based on these initial findings, the SYSTEM Initiative of the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, has evaluated the validity of loss of complete retention of dental sealants as measure for sealant effectiveness. A three-step approach was followed: Firstly, the rate of sealant retention and the occurrence of caries for the two most common sealant types - resin and glass-ionomer based sealants - were assessed. Secondly, the loss of retention of each sealant type was directly linked to the occurrence of caries on sealed teeth. Finally, the difference between the retention/caries ratios of both sealant types was tested for significance.

Suitable clinical trials for this investigation were identified through a systematic literature search of main international data sources, such as the Cochrane library and PubMed/Medline, as well as regional data sources such as Scielo and InMed. Only trials with a minimum follow-up period of two years were included. Data relating to the number of teeth that had been sealed in the past and later lost sealant material and teeth that had later developed caries were recorded for analysis.

The results showed that risk of losing sealant material was significantly associated to caries when resin sealant was used, but not when using glass-ionomers. The disagreement when using glass-ionomer sealant may be explained by two points: (i) as glass-ionomer sealants fracture cohesively, remnants stay at the base of pits and fissures and may continue to offer caries prevention and (ii) the fluoride from these remnants may effect remineralisation.

The ratios of sealant retention to caries for the two sealant types were significantly different and indicate that sealant retention is not independent from the sealant material used. For this reason, sealant retention cannot be regarded as valid measure for general sealant effectiveness.

There is danger that using invalid quality criteria may lead to the unjust rejection of valid sealant materials. In the past, several systematic reviews have compared the clinical, caries preventive effect of the two most common sealant materials resin and glass-ionomers but found no difference between the two. These findings are in spite of the significantly inferior retention rate of glass-ionomers.

The conclusions of the new findings suggest the need for adopting clinical outcomes, such as caries occurrence rate in formerly sealed teeth as ruling quality criterion for pit and fissure sealants, instead of sealant material...
retention.

For daily dental practice this means that the effectiveness of different sealants at preventing caries cannot be determined from their retention rate and thus is not a useful guide for selecting an effective sealant material. Instead, the ratio of caries-free teeth to the total number of sealed teeth after a period of time as direct clinical measure should be used.

The full reports of the findings are available online for free download:


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