Risk–benefit of fluoride toothpaste

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In this issue we look at two very important systematic reviews published by the Cochrane library.[1–2] The first one[1] is notable in that, I believe, it is the first time that a network meta-analysis has been performed in a dental systematic review. This type of analysis represents a development of meta-analytical approaches to data and allows use of the available data to make indirect comparisons. The other point regarding this review is that it clarifies a dose–response effect for fluoride toothpaste hinted at in the earlier Cochrane toothpaste review by one of the co-authors here.[3] The review highlights how the first concentration of toothpaste to provide evidence of an important preventive effect is that containing 1000 ppm fluoride, and that currently the evidence for a significant difference between 1000 and 1500 ppm is lacking.

This, and the findings of the other review on fluorosis,[2] together form an interesting area for discussion. The most recent published guidance in the UK[4] recommends that, "a pea-sized amount" of toothpaste of 1350–1500 ppm fluoride and above could be used in children aged 3–6 years. As a member of the group contributing to this publication, I can attest to the fact that the decision was based on several points. The first of these was the age at which the crowns of the upper permanent incisor teeth have finished calcifying (these being the most obvious teeth to be affected if there were an increase in fluorosis). Second was the fact that the majority of the child population are at risk of caries, and the recognition that, although this recommendation may result in an increase in fluorosis, this was unlikely to be of aesthetic concern. That is, this judgement was a population-based decision based on the known benefits and risks at the time. Much of the available evidence considered by the group was the same as that considered in each of the two Cochrane reviews, but the detailed analysis undertaken by these reviews was not available at that time.

The question that arises is whether these new Cochrane reviews change my opinion, and how we should use them to inform our patients and individual decision-making. In addition to the information from these two new reviews, there are some other pieces of information that need to be considered. There is evidence that toothpaste-swallowing, and eating/ licking habits increase fluorosis,[5] which supports recommendations for toothbrushing in under-7s to be supervised.[6] There is some evidence that some populations consider mild fluorosis to be aesthetically pleasing or of no aesthetic disadvantage,[7] but individual and population concern about mild fluorosis needs to be examined further and is likely to vary greatly.

These Cochrane reviews do not make our decision-making any simpler, but they do give us good information with which to inform our discussion with patients and carers. The advice given to individuals should be based on the child's risk of caries, the parents' willingness to follow recommendations relating to the amount of fluoride toothpaste placed on the brush and to supervise brushings, and what their level of acceptance is of the risk of fluorosis for their child. This will obviously vary greatly and needs to be a joint decision.

What of current guidelines and guidance? In the UK, the Scottish Intercollegiate Network Guideline recommendation[6] about the use of 1000 ppm toothpaste is still, I believe, supportable, based on these new reviews. The blanket guidance in England, however, on the use of 1350–1500 ppm from the age of 3 years is more questionable and needs to be revised in light of this new evidence.

I would recommend that dental professionals read both of these new Cochrane reviews in detail. You can also listen to a brief summary of the toothpaste review in the form of a podcast available from the Cochrane website (www.cochrane.org/podcasts). These short podcasts are a relatively recent innovation, and highlight the main issues in a selection of Cochrane reviews. Another new feature is the Cochrane journal club, and the Cochrane Oral Health Group will be getting involved with this presently. Finally, it is worth noting that the Cochrane website (www.cochrane.org) itself has had a makeover in recent weeks.

This editorial is based on a discussion with Jan Clarkson.

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