Daily oral hygiene – the role of toothbrushing in oral health protection

Controversial as this may sound, dental professionals are not beauty therapists! We cannot and should not just undertake treatment at our patients' request, whether it is good for them or not. And we certainly shouldn't undertake treatment without arming patients with the knowledge and skills to be able to maintain oral health.

We are health professionals, which means that sometimes we may need to take on the role of parent towards our patients in order to look after their long-term interests.

And with a raising of expectations in current society to look and feel younger for longer patients not only expect a beautiful smile, they expect their teeth to continue to function well into the future.

The mouth can be a very hostile environment with cyclic loading, big temperature changes and changes in pH levels due to diet, and reflux all adding to the mix to challenge dentition. Our job is to try to help patients to manage some of these challenges as part of their oral care to ensure their teeth remain effective for as long as possible.

In this article, I will focus on bacterial mediated diseases, namely caries and periodontal disease, and review the role of twice daily brushing in helping preventthese diseases.

Prevention of dental caries

As dental professionals we are all aware of the multifactorial aetiology of dental caries, but are our patients? I believe that time needs to be spent ensuring that patients are aware that there is more to caries than just sugar.

I try to explain to patients who present with either primary caries or multiple secondary caries that there are two very important factors in respect to their experience of tooth decay – their tooth substance and how well mineralised it is, and also the content of their saliva. This helps to set the tone and explain that, whilst they may be maintaining similar oral hygiene habits to their friends, there is a reason why they are experiencing increased rates of dental decay. As these factors are not easy to readily influence, I use this to reinforce the aspects of prevention they **can** influence – reducing the frequency of sugar intake and the important role played by fluoride when brushing twice daily with a fluoride toothpaste. I explain that their 'genetic backdrop' governs how regimental they must be when it comes to the factors they can control.

The most important effect of fluoride is to prevent the loss of calcium and phosphate from the surface of the tooth. Low levels of fluoride in the plaque and saliva can alter the chemical balance between demineralisation and remineralisation. This allows new mineral crystals to be deposited which have better structure and greater acid resistance. This appears to be the most important mechanism by which fluoride toothpastes work.

Prevention of gingivitis and periodontitis

The other common bacterially mediated disease that patients suffer with is gingivitis. Not all patients will progress to developing periodontitis and the hosts' response to plaque will determine the rate and severity of disease progression.[1] In most cases gingivitis precedes periodontitis.[1]

The most important plaque control method is effective toothbrushing with a fluoride toothpaste. In addition, our responsibility as dental professionals is to ensure that any treatment provided minimises plaque retention.

The mouth is an extension of the gut and is technically not inside the body. The body is a sterile environment and yet the gastro intestinal tract has millions of bacteria which we need to enable us to digest food, and also to form a certain vitamins and other substances that allow our bodies to function properly.

We all know that the mouth is full of bacteria, but it should be made clear to patients that the role of oral care is not to eradicate all of these bacteria. The vast majority are 'friendly' (commensal) and they are aerobic. But think of biofilm as being like a city. It is only when there is a certain level of maturation and organisation that an infrastructure develops that allows different pathogenic bacteria to develop.

With the changing nature of the bacteria present within plaque there are numerous points at which intervention might disturb the normal process of plaque build-up. This intervention could provide a way of reducing plaque or alter its composition to reduce the number of harmful species.[2]

If the network that allows the anaerobes to survive and strive can be destroyed they will be unable to cause the gingival inflammation which causes bleeding and can lead to further, more significant, impacts.

According to the European Federation of Periodontology the impacts of periodontal disease are widespread and significant. Periodontitis has been found to impair aesthetics, cause disability, lead to social inequality and reduce quality of life. In addition, it has a significant impact upon escalating public health costs.[3]

This insight supports the need to help patients to prevent this disease by undertaking effective oral care every day.

The role of toothpaste in helping prevent caries and periodontal diseases

Traditionally, when it comes to brushing, protection against caries comes from the fluoride in toothpastes and prevention of gingivitis comes from biofilm disruption, from the mechanical effect the bristles have on plaque. But are there other ingredients in toothpaste which can enhance this plaque removal?

Sodium bicarbonate ($NaHCO_3$) toothpastes have been shown to remove more plaque than non-sodium bicarbonate toothpastes immediately and especially from hard to reach areas.[4]

Toothpastes with 67% sodium bicarbonate formulations have also been shown to enhance the physical removal of plaque achieved with brushing.[5]

Corsodyl toothpaste, developed by GSK for patients with or susceptible to gingivitis, has been shown to remove up to 4x more plaque than a regular toothpaste* after 6 months helping patients maintain good plaque control between dental visits.[6] Refined sodium bicarbonate particles in this formulation penetrate the plaque layer, disrupting the sticky polysaccharide matrix and loosening the structural integrity of the biofilm.[5] The formulation also offers standard levels of fluoride protection and is therefore a simple everyday switch which could help patients control plaque and therefore maintain gum health.

Plaque-induced oral diseases such as caries and gingivitis remain a focus for us as dental professionals. With the control of plaque an everyday necessity for patients we need to consider simple steps to help aid plaque control. Consideration (or recommendation) of a specialist toothpaste could be one of these steps.

*Removes more plaque after a professional clean and twice daily bushing. Excludes Whitening variant.

References

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