Narwhal Tooth
The 16th Biennial Conference on the Biology of Marine Mammals in San Diego, California, in December 2005 contained some surprising news about the narwhal whale, also known as the unicorn whale due to the long tooth, or tusk, which emerges from its head. Dr. Martin Nweeia, a researcher at the Harvard School of Dental Medicine (HSDM) revealed that the narwhal’s tooth has ten million tiny nerve connections that extend from the central nerve of the tooth to its outer surface.

This lends the tooth hydrodynamic, sensor capabilities allowing the narwhal to detect changes in water such as particle gradients, pressure and temperature. Also, given that these whales tend to rub tusks with one another, this behavior likely grants them a unique sensation.

Ancient Drilling
A report in Nature (2006;440: 755–756) reveals that dental drilling has been around a lot longer than we ever realized. Researchers at a Neolithic graveyard in Pakistan found eleven drilled molars. The surprise is that these grave dates from 7,500 to 9,000 years ago, which is roughly 5,500 years earlier than any other evidence of drilled teeth currently in collections. Apparently flint drill heads were used on the latest finds. Drill depth was from 0.5 to 3.5 mm, and the fact that it was performed on first or second permanent molars suggests that it certainly was not done for esthetic purposes. Only four of the eleven teeth show signs of caries in relation to the hole drilled, a fact that could mean the drilling was intended to be therapeutic in nature. Additionally, the teeth exhibit marginal smoothing, which attests to the fact that the “patients” were alive at the time and continued to chew with the teeth after the fact.

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Practice Matters

New Patients
Tactfully introducing new patients to your staff and members play in welcoming new patients! If you do not have an established approach to new patients, join Castagna and Moore as they guide towards creating a comprehensive new patient experience.

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Risk Management

Trauma
Dental injuries happen to children and adults alike. So what is the best way to handle them and may prepare beforehand? Dental Protection Ltd. article looks at some of the less obvious, direct legal implications of trauma.

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Trends & Applications

Giving Back
During the 2005 ADA meeting in Philadelphia, Dental Tribune spoke with Dr. Kenneth Malament, an internationally respected lecturer in restorative techniques and products. He shared with us his insights about today’s emerging trends in prosthetics.

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Meetings & More

Heading to Sydney?
Dental Tribune and Philips Oral Healthcare’s Symposium on the Periodontal Aspects of Oral Health next stops in the “Land Down Under”. Register by 31 July because the event booked out at its previous stops.

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DENTAL TRIBUNE
The World’s Dental Newspaper · Asia Pacific Edition

Systemic Implications of Oral Health: Diabetes

Juliette Reeves, United Kingdom

Periodontal disease has long been considered a localised infection, however, research over the last few years is now linking the periodontal diseases to a variety of conditions and diseases with systemic implications. These include systemic infections, cardiovascular disease, pregnancy outcomes, respiratory diseases, diabetes and increased all-cause mortality rate. It has been suggested that infection in the periodontal tissues, primarily by gram-negative anaerobic bacteria, can trigger a series of immunologic and inflammatory changes leading to the initiation of systemic disease.1

The interaction between oral infection and systemic health was first described in Ancient Egypt,2 with the concept of focal infection dating back more than a hundred years. Willoughby Dayton Miller again proposed this relationship in an 1891 commentary published in Dental Cosmos.3 By the 1950s however, the theory was being dismissed.4 More recently the concept has returned to the dental arena. This was partly because of new data reported by Finnish researchers in the late 1980s when dental infections were found to be statistically linked with heart disease and stroke.5

Diabetes
The effect of diabetes on the oral tissues had long been recognised. Diabetics are said to exhibit poorer oral health than non-diabetics.6–11 Diabetics have been found to have a higher average gingival index and higher or the same plaque index levels relative to controls.12 Periodontitis is now considered the sixth most common complication of diabetes mellitus.13 Persons with non-insulin-dependent diabetes mellitus are the most exposed to develop periodontal disease than non diabetic individuals.14

Risk Indicators


The November 2005 edition of the Journal of Periodontology (2005, Vol. 76, No. 11, Pages 1910–1918) featured the results of a study that defined the risk indicators for tooth loss from periodontal disease. Study subjects included 1,775 patients with a total of 3,694 extracted teeth. Among the subjects, 31% were either currently smokers or had been in the past. More men (38%) lost their teeth for periodontal problems than women (27%). Finally, 19.2% of the subjects had diabetes mellitus while 13.6% per cent had hypertension.

The research results have bearing due to the fact that risk assessment is an important aspect of dental care. Identifying patients with the highest risk for periodontal disease means a dentist is better equipped to prevent it.
Glycemic Control

It is well established that poor glycemic control is known as an established risk factor for periodontitis. However, there is also same evidence that severe periodontal disease may deteriorate glycemic control. A positive association between variations in the blood glucose level and the degree of periodontal disease was reported in type II diabetes mellitus. One study demonstrated loss of attachment is greater in controlled diabetes ages 30-40 with a disease duration of over ten years. Periodontal treatment has been shown to be associated with improved diabetic control as demonstrated by reduced glycosylated haemoglobin in diabetic patients. In this study, however, periodontal therapy on its own did not significantly affect glycemic status even in nondiabetic patients. This was only achieved when combined with antibiotics. Other studies have shown a reduced need for insulin administration in diabetic patients after receiving periodontal treatment. Further studies are needed to show a consistency in these associations. Other groups also need to be examined such as women and low income groups. Common risk factors also need to be evaluated.

Common Risk Factors

Similarities in the aetiology of periodontal disease and other complications of diabetes are emerging. The aetiology of diabetes seems to be a combination of intrinsic (genetic) factors and environmental influences. In much the same way as the periodontal diseases are viewed, diabetes is considered a series of diseases that have insulin resistance in common. It is suggested that increased genetic susceptibility, impaired insulin response and an excess production of collagenase may all play a role in the development of both periodontal disease and diabetes. In addition to a possible common link, confounding risk factors may explain part of the association. There are many lifestyle factors the two diseases have in common. These include stress, smoking, dietary intake, socioeconomic status, weight, fear and depression.

Stress

Factors such as elevated levels of hormones antagonistic to insulin may play a role in the development of insulin resistance and inflammatory changes. Stress has been shown to play a role in affecting glycemic control and as a negative factor in periodontal treatment outcome.

Smoking

Smoking and diabetes are considered to be two major factors in the development of periodontal disease. Smoking is recognized as a major factor in the aetiology of periodontal disease and oral inflammatory bone loss. Smoking and diabetes are considered to be two major factors in the development of periodontal disease. Smoking is recognized as a major factor in the aetiology of periodontal disease and oral inflammatory bone loss. Smoking and diabetes are considered to be two major factors in the development of periodontal disease. Smoking is recognized as a major factor in the aetiology of periodontal disease and oral inflammatory bone loss.

Obesity

Obesity has also been linked to the development of diabetes and periodontal disease. The link between obesity, periodontal infections and diabetes has been suggested as being mediated by increased levels of tumour necrosis factor (TNF) which may lead to a hyper inflammatory state. This would in turn increase the risk for periodontal disease and accounting in part for insulin resistance. Further research is required. Recent study has shown that both smoking and obesity are independent risk factors for periodontal disease exhibiting a dose-response relationship with peridental disease.

Healthy Lifestyle

Maintaining normal weight, engaging in the recommended level of exercise, and eating healthy food are known to improve general health. The impact of these behaviours is associated with reduced risk of both diabetes and periodontal disease. If this is so then it is likely to include several pathways for these associations. These include adequate antioxidant intake from fruit and vegetables, adequate fibre and a reduction in refined carbohydrate consumption. Antioxidant status has shown to be impaired in diabetic patients, negatively affecting the production of the antioxidant enzymes. Glutathione peroxide and superoxide dismutase. These provide a defence against the damage of cells by reactive oxygen species, which is increased in the diabetic state. The impairment of this same system has also been implicated in the increased susceptibility to the periodontal disease.

Nutrition

Diabetes is fundamentally affected by dietary intake. Several dietary factors have been linked to systemic disease. These include adequate antioxidant intake from fruit and vegetables, adequate fibre and a reduction in refined carbohydrate consumption. Antioxidant status has shown to be impaired in diabetic patients, negatively affecting the production of the antioxidant enzymes. Glutathione peroxide and superoxide dismutase. These provide a defence against the damage of cells by reactive oxygen species, which is increased in the diabetic state. The impairment of this same system has also been implicated in the increased susceptibility to the periodontal disease.

Similar results have also been found with reference to diabetes. Conclusion

It is plausible that there may be a causal link between periodontal disease and diabetes. If this so then it is likely to include several pathways for these associations. These include adequate antioxidant intake from fruit and vegetables, adequate fibre and a reduction in refined carbohydrate consumption. Antioxidant status has shown to be impaired in diabetic patients, negatively affecting the production of the antioxidant enzymes. Glutathione peroxide and superoxide dismutase. These provide a defence against the damage of cells by reactive oxygen species, which is increased in the diabetic state. The impairment of this same system has also been implicated in the increased susceptibility to the periodontal disease.

Sudden Death of WHO Director-General

The WHO Director-General, Dr Lee Jong-wook, prior to the opening of the 117th session of the World Health Organization since 21 July, 2003. He had worked for WHO for 23 years, at country and regional levels, and at WHO Headquarters in Geneva. He is survived by his wife and son, and the family of his two brothers and one sister. Dental Tribune International extends its sincere condolences to Dr Lee’s family.

In those that smoke the risk factor is higher. An increased risk for destructive periodontal disease is true for twins with independent diabetes mellitus.

There is an increasing body of evidence to suggest that chronic periodontal disease can disrupt glycemic control and that periodontal disease may be a risk factor in the development of diabetes. It has been suggested that a causal relationship is mediated through the production of endotoxins and other bacterial products that increase insulin resistance, through the up regulation of macrophage responses, advancement of insulin resistance and insulin resistance. These large molecules accumulate in body tissues, causing disruption of normal function. It is suggested that these cellular reactions also occur from bacterial activity in the periodontal tissues causing tissue destruction. Another hypothesis concerns the effects of serum lipids on immune cell function. There appears to be a casual relationship between serum lipids levels and systemic health, particularly cardiovascular disease, diabetes, tissue repair capacity, and immune cell function, susceptibility to periodontitis, and serum levels of pro-inflammatory cytokines. In the terms of the periodontal relationship between periodontitis and systemic disease, it is possible that periodontal disease-induced changes in immune cell function cause metabolic dysregulation of lipid metabolism through mechanisms involving pro-inflammatory cytokines. Sustained elevations of serum lipids and/or pro-inflammatory cytokines may have a serious negative impact on systemic health. It’s not clear yet, whether the changes in lipid and glucose metabolism are the cause of the consequence of periodontitis.

Acute viral and bacterial infections are known to induce insulin resistance. To demonstrate a bi directional effect can elimination of periodontal infection improve metabolic control of diabetes? Sudden Death of WHO Director-General

The 59th World Health Assembly was held in Geneva, May 2006 in a somber mood following the death of the World Health Organization (WHO) Director-General, Dr Lee Jong-wook. Dr Lee, who was 61, had been in hospital since 20 May, 2006 in the afternoon where he underwent surgery to remove a blood clot in his brain. The Assembly observed a two-minute silence, and was suspend for 30 minutes following the announcement of Dr Lee’s death. Dr Lee, a national of the Republic of Korea, had been Director- General of the World Health Organization since 21 July, 2003. He had worked for WHO for 23 years, at country and regional levels, and at WHO Headquarters in Geneva. He is survived by his wife and son, and the family of his two brothers and one sister. Dental Tribune International extends its sincere condolences to Dr Lee’s family.

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