Physicists shed light on geographic tongue
Research provides new insights into dynamics of inexplicable condition

REHOVOT, Israel: Physicists at the Weizmann Institute of Science in Israel have clarified the intricate dynamics underpinning a tongue condition that has puzzled the medical community for decades. Known as benign migratory glossitis or geographic tongue (GT), the condition affects around 2 per cent of the global population and is characterised by evolving red patches on the surface of the tongue that may resemble a map.

The red patches appear due to loss of one of the four types of lingual papillae, tiny hair-like protrusions that cover the surface of the tongue. The affected type, called filiform papillae, is mainly distributed in the anterior two-thirds of the tongue. Despite extensive research, the exact cause of GT, a benign and mostly painless condition, remains unknown.

In their study, the researchers performed a number of numerical simulations to closely examine and visualise the development of GT, and devised a new way of identifying the severity of individual cases. “We hope these results can be used by physicians as a practical way of assessing the severity of the condition based on the characteristic patterns observed,” said lead author of the study Dr. Gabriel Seiden, a researcher at the Weizmann Institute of Science in Rehovot in Israel.

Benign migratory glossitis affects around 2 per cent of the global population. (Photo Angel Simon / shutterstock.com)
The scientists approached the problem of GT as if it were an excitable medium—a spatially distributed, dynamic system with the ability to propagate signals without damping. A forest fire is a classic example of an excitable medium: it travels as a wave from its ignition point and regenerates with every tree it ignites.

This is in contrast to passive wave propagation, which is characterised by a gradual damping of the signal amplitude due to friction. However, after a wave has passed through, excitable media have to reconstitute before they can support the passing of another wave. In this way, a fire can spread through a forest, but it cannot return to a burnt spot until the vegetation has regrown.

The study found that GT can spread across the tongue in two different ways, each of which has distinguishing characteristics that could be used to diagnose severity. The researchers duly covered that the condition, which typically starts as small circular patterns until the whole tongue becomes affected. Once affected, the tongue then heals itself. Alternatively, the condition can develop through the formation of spiral patterns. The simulations showed that these spirals evolve in regions of the tongue that are still recovering, causing regeneration of that particular region.

“While the propagation of small circular lesions results in the whole tongue being gradually affected and subsequently healed, the propagation of spiral patterns involves a continuous, self-sustained excitation of re-veering regions, implying a more acute condition that will linger for a relatively long period of time,” Seiden explained.

Just as the development of forest fires can be strongly affected by external conditions, such as the strength of the wind, conditions surrounding the tongue may have important consequences for the dynamics of GT, according to the researchers.

In their study, they give the example of GT observed in a 1-year-old boy who developed the characteristic lesions on multiple occasions along the tongue’s edge—adjacent to the growing teeth, implying that the continuous rubbing of the tongue against the gingiva may trigger the condition.

“Going forward, we intend to collaborate with physicians and dentists who treat GT patients to obtain valuable data regarding the dynamic evolution of the condition,” Seiden concluded. “This will allow for further, more quantitative explorations of GT, and eventually lead to a firmer understanding of what causes the condition.”

Professional tasters usually test up to 150 wines per day, and wine judges even more. With each tasting, the bough is retained in the mouth for up to 60 seconds before it is spat out.

In order to assess the demineralisation during wine-tasting, the team simulated the conditions of the process in a laboratory, exposing extracted third molars repeatedly to white wine and artificial saliva. After 1 and 10 minutes, a nano-scratch test was conducted and the result was an ‘increased scratch depth.’

Surface roughness of the enamel also increased by almost 200 per cent. Reflecting on the findings, the researchers recommended that professionals take early preventative measures, including the application of remineralisation agents, such as calcium, phosphate and fluoride, to minimise the risks of erosion. Chewing gum and skipping toothbrushing the morning before the wine-tasting are additional measures that could lessen the occupational hazard, they said in the report.

“After a wine-tasting, the teeth are likely to be much softer, so we recommend rinsing with water, and when it comes time to clean the teeth, just put some toothpaste on your finger and cleaning with that,” remarked Associate Professor Sue Bastian from the university’s School of Agriculture, Food and Wine, which also teaches wine-making, about the results. “Cleaning with a brush when teeth are soft runs the risk of damaging the enamel.”

With pH values of 3 and 4, the acidity of wine is comparable to most soft drinks, which, owing to their high concentration of organic acids, are reported to be the main cause of the increase in tooth wear around the globe, particularly among children. Most professional wine organisations, however, currently do not recommend any special precautions for their members.
One system for better restoration

DENTSPLY exhibits premium material collection at APDC congress in Singapore

According to the company, the “one” collection consists of ceram.x one, a composite available in different translucencies for everyday aesthetics (ceram.x one UNIVERSAL) and highly aesthetic restorations (ceram.x one DENTIN & ENAMEL). It also contains two bonding systems, one for total-etch applications (prime&bond one ETCH & RINSE) and one for self-etch, selective enamel etch and total-etch applications (prime&bond one SELECT).

Covering the full VITA (VITA Zahnfabrik) shade range with just seven shades, ceram.x one UNIVERSAL is extremely simple and easy to use, the company said. With intermediate translucency ranging between natural enamel and dentine, ceram.x one UNIVERSAL offers a powerful chameleon effect to facilitate natural, lifelike restorations and is ideal for everyday use. While many composite systems offer a myriad of shades and translucencies, making it difficult to match the colour of the natural teeth, ceram.x one DENTIN & ENAMEL replicates the structure of natural teeth utilizing just two translucencies: dentine shades that mimic natural dentine and enamel shades that mimic natural enamel. Also covering the full VITA shade range, it enables highly aesthetic, natural restorations with only four dentine and three enamel shades.

It is difficult to achieve an optimum level of dentine moisture prior to the application of an adhesive. Overwet or overdry dentine can lead to insufficient sealing, resulting in microleakage and post-operative sensitivity. Prime&bond one ETCH & RINSE offers a technique-tolerant solution, providing high bond strength and reliable performance even on overdry dentine, according to DENTSPLY.

The literature often recommends using a self-etch adhesive in cavities with a large proportion of exposed dentine in order to minimise the risk of post-operative sensitivity. However, etch-and-rinse adhesives have shown superior long-term results on enamel. Prime&bond one SELECT combines the advantages of both techniques. It provides high bond strength with all etching techniques (self-etch, etch and rinse, and selective enamel etch) and delivers reliable performance even on overdry dentine, resulting in virtually no post-operative sensitivity.

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Daniel Zimmernann

These words from one of Britain’s most famous statesman Winston Churchill aptly describe the recent relaunch of Dental Tribune UK. The new edition is the result of months of reorientation and repositioning that will see the return of an active participant in the British dental publishing scene. At this opportunity, we would like to thank our former partners for their years of commitment and wish them best of luck for their future endeavours.

Our publishing group has come a long way since the first edition of Dental Tribune UK was launched in 2007. From a few publishers operating in key markets only, it has grown into a large-scale global operation with offices and representatives in almost every corner of the globe; to borrow a famous historical phrase, the sun never sets on the Dental Tribune International (DTI) network, as somewhere in the world a Dental Tribune publisher or partner is always working. And our expansion is still far from over; coinciding with the relaunch of the UK edition, Dental Tribune has introduced its first-ever Nordic edition at the SCANDESA show in Copenhagen in Denmark to serve all markets in Scandinavia and Finland. Developed as a pan-regional title, the new edition will cover and analyse everything dentistry in the region, as well as internationally. With four editions per year and published in English only, it builds on the substantial knowledge and publishing expertise that has distinguished Dental Tribune partners in almost every corner of the world for the last two decades.

Moreover, last year saw the successful premiere of the Digital Dentistry Show, a show within a show expo format that will see further geographical and topical expansion in 2015. For information and updates on all our exciting new projects, I invite you to visit our website at www.dental-tribune.com.

Sincerely,
Daniel Zimmernann
Group Editor
Dental Tribune International

Difficulties mastered are opportunities won

“Shouldn't we say something?”

AD

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Increasing number of European adolescents brush teeth twice a day

DTI

GHENT, Belgium/JYVÄSKYLÄ, Finland/COPENHAGEN, Denmark: An international team of researchers has studied the daily frequency of toothbrushing in adolescents from 20 different countries and regions in Europe between 1994 and 2010. The researchers found that the prevalence of brushing more than once a day has increased in most of the surveyed countries and regions over time, with the highest increase observed in Estonia, Latvia, Russia, Finland and Flemish Belgium.

“From a public health perspective, improvement of toothbrushing habits is important in preventing the most common dental diseases, but even more so in reducing common risk factors for the main non-communicable diseases,” the researchers stated in the study. According to them, brushing twice a day is one of the most important self-care methods and has become a universal recommendation worldwide in order to maintain good oral health. In light of recent findings regarding the association between oral disease and the four main non-communicable diseases—diabetes, cancer, cardiovascular disease and respiratory disease—the importance of regular toothbrushing has increased even more.

For their study, the researchers from the University of Jyväskylä in Finland, Ghent University in Belgium and the National Institute of Public Health in Denmark used data from five consecutive Health Behaviour in School-aged Children (HBSC) surveys conducted between 1994 and 2010.

The HBSC research network is an international alliance of researchers that collaborate on the survey of schoolchildren. The HBSC collects data on 11-, 13- and 15-year-old boys’ and girls’ health and well-being, social environments and health behaviours. The researchers choose these age groups because they mark a period of increased autonomy that can influence how a person’s health and health-related behaviours develop. The cross-national survey, initiated in 1982, is conducted every four years in 44 countries and regions across Europe and North America in collaboration with the World Health Organization’s Regional Office for Europe.

The scientists determined the frequency of toothbrushing by analysing the adolescents’ answers to the mandatory HBSC question in this regard, including study year, country, sex and age as variables. The 20 countries considered in the study included various central, eastern and northern European countries, as well as Russia and Canada.

In most of these countries, the prevalence of brushing twice a day has increased significantly, while the cross-national differences have diminished. In 1994, the rate of adolescents brushing their teeth twice a day ranged from 30 to 86 per cent. In 2010, between 50 and 81 per cent of the surveyed children said that they brushed twice every day.

In 1994, the countries with the lowest prevalence of brushing twice a day included Lithuania (30 per cent), Latvia (54 per cent), Russia (58 per cent), Finland (58 per cent), Estonia (42 per cent) and Flemish Belgium (45 per cent). By 2010, between 50 and 61 per cent of the children in all of these countries brushed twice a day.

The countries with the highest rate of adolescents brushing their teeth twice a day in 1994 were Sweden (86 per cent), Denmark (80 per cent), Norway (75 per cent) and Germany (75 per cent). By 2010, Sweden’s rate had decreased to 81 per cent and Denmark’s to 76 per cent. Norway’s rate remained at 75 per cent, while Germany’s increased to 80 per cent.