Dental caries not genetic

By DTI

MELBOURNE, Australia: In the first large-scale study to look at the oral microbiome, researchers from Murdoch Children's Research Institute (MCRI) have determined that an individual's genes are not associated with the presence of bacteria responsible for dental caries. Rather, this is more greatly influenced by environmental factors like diet and oral hygiene habits.

To understand exactly the role of genetics in the make-up of the oral microbiome, the research team conducted a twin study. They profiled the supragingival plaque microbiome of 205 pairs of genetically identical twins and 280 sets of non-identical twins between 5 and 11 years old based on mouth swabs. From this, they concluded that, while certain components of oral microbiome composition are influenced by genetic background, these inherited bacteria are not linked to dental caries.

"There may be a perception in the community that bad teeth are inherited," said study co-author Dr Jeff Craig, an associate professor at MCRI. "But this research is an important message because it means parents and children themselves can take control. We're not doomed by genetics in tooth decay."

The researchers also found that the level of inherited bacteria tended to decrease over time, whereas the bacteria associated with environmental factors increased. In light of these findings, Craig reiterated that limiting children's intake of sugary foods and drinks, combined with a consistent oral hygiene routine, is the best way to prevent caries.

The study, titled “Host genetic control of the oral microbiome in health and disease,” was published online on 13 September in the Cell Host & Microbe journal.

School bullying

Verbal bullying at school can negatively impact an adolescent’s mental health, causing distress and anxiety. A Brazilian case-control study has now shown that this stress may be reflected in oral health too and possibly result in nocturnal bruxism. The cases were composed of 103 school pupils between the ages of 9 and 11 with possible sleep bruxism (i.e. self- or parent-reported) and the controls of 206 adolescents without possible sleep bruxism.

Among the participants, 154 (45.5 per cent) reported involvement in verbal school bullying episodes as a victim, perpetrator or both. The vast majority (90.3 per cent) of them were males. Overall, these teenagers were found to be four times as likely to suffer from sleep bruxism (65 per cent) compared with those who were not involved in verbal school bullying (17 per cent).

Sydney to host FDI 2021

The Australian Dental Association (ADA) has announced that the FDI World Dental Congress will be held in Sydney in September 2021. "It is proof that Australia occupies an enviable place at the forefront of world dentistry and that this has, once again, been recognised by leading figures in the world of dentistry,” ADA President Dr Hugo Sachs said.

"There is a growing global realisation that the dental profession has a pivotal role to play in global health, and this event will be an opportunity for dental professionals to contribute to the discussion," Dr Sachs said.

Researchers from Australia have found that more than a quarter of biomedical scientific papers may utilise practices that distort the interpretation of results or mislead readers—a practice known as “spin”. The highest, but also greatest, variability in the prevalence of spin was present in the clinical trials included in the review.

The presence of bacteria in the oral microbiome associated with dental caries is influenced more by environmental factors than genetic ones, the results of a new study have suggested.

Prevention first

BRISBANE, Australia: A recent article, published in the British Dental Journal, has recommended a maximum interception approach involving all members of the healthcare team and promoting evidence-based self-care, taking into account salivary, plaque and lifestyle risk factors.

According to article author Prof. Lawrence James Walsh, from the University of Queensland, dental professionals must be prepared for the sheer number of older patients, retaining their natural teeth for longer. "A central tenet of modern preventive dentistry is to avoid intervening before prevention has been given a chance to work,” emphasised Walsh.

"Protocols for oral care must be tailored to the patient’s needs and be realistic given the limitations in time, finance and energy which can be expanded,” Walsh said. "Particular problems include root surface caries in patients with a strong history of caries and those who suddenly develop salivary hypofunction. Furthermore, elderly patients suffer from more chronic diseases.

INTERVIEW

ACFF Chairman Prof. Nigel Pitts about the global burden of caries and the social and economic value of a cavity-free future.

CAMPAIGN

Oral-B and the European Federation of Periodontology are running a joint campaign to raise awareness of oral health during pregnancy.

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First-ever robot-led dental surgery performed in China

By DTI

XI’AN, China: For the first time ever, a robot has independently placed two 3-D-printed implants into a patient’s mouth without human involvement. The successful procedure raises hopes of lessening Asia’s dentists shortage, especially prevalent in metropolises such as Hong Kong and Singapore, and of avoiding risks posed by poor-quality surgeries performed by unqualified dentists.

After taking a CT scan to acquire data on the female patient’s skull and jaw, the medical staff fitted position orientation equipment to the woman and determined the movements, angle and depth needed to fit the implants in her mouth so that the robot could be programmed to move into the correct position to carry out the operation. According to Prof. Zhao Yimin, a surgeon from the Fourth Military Medical University (FMMU) in Xi’an, the procedure went very smoothly and the implants were placed with high precision.

Although human staff were present at all times during the 1-hour surgery, they did not play an active role. The robot, which was jointly developed by the Beihang University in Beijing in China and FMMU’s Stomatological Hospital in Xi’an, performed its task with high precision.

However, the number of qualified dentists in the country is insufficient to meet the increasing demand. Through a continuing implementation of robot technology, this shortage may be eased.

In the future, robot-assisted and-led technology could increasingly facilitate dental surgeons’ work, experts have predicted. Robotic technology has already been introduced in recent years to assist in dental procedures such as root canal therapy, orthodontic operations and implant placement. In March this year, a pioneering robotic guidance system, YOMI, received clearance from the U.S. Food and Drug Administration. The computerised navigational system delivers physical guidance through the use of haptic robotic technology, which provides sensory feedback and constrains the drill in position, orientation and depth, the device’s manufacturer, Neosis, stated.

IMPRESS

First-ever robot-led dental surgery performed in China

In the same article, the inauguration of the International Dental Exhibition Congress (IDEC) was discussed. Co-organised by Koelnmesse Pte Ltd and the association (Persatuan Dokter Gigi Indonesia), IDEC 2017 was held from 15 to 17 September under the theme “Modern science and technology for the future of Indonesian dentistry.” According to event chairperson Dr Domo Suaeso, the scientific programme was designed to cover as many aspects of dentistry as possible and aimed at inspiring attendees to provide patients with a better standard of dental care.

The event, which was jointly organised by the Indonesian dental association (Persatuan Dokter Gigi Indonesia), Koelnmesse Pte Ltd and Traya Eksibisi Internasional, will return to Jakarta in 2019, alternating with IDEC Singapore. Further information can be obtained at www.indonesiandentalexpo.com.

The first Indonesian Dental Exhibition and Congress proved to be a successful event for exhibitors and visitors alike.
Newly created protein may be promising for anti-caries vaccine

By DTI

WUHAN, China: Researchers from the Wuhan Institute of Virology at the Chinese Academy of Sciences have created a fusion protein (formed through the joining of genes that originally coded for separate proteins) that might be the key to developing a vaccine against dental caries. According to the research team, their second-generation fusion protein provides high protective efficacy against caries, but with lower side-effects than with previously created proteins.

The research, which was supported by grants from the National Natural Science Foundation of China and the German Research Foundation, is an advancement on previous studies on the fusion protein KF-rPAc. While KF-rPAc provided prophylactic and therapeutic efficiency against caries, it also demonstrated possible side-effects, such as high antigenicity and potential inflammatory injury, that restricted its clinical usage.

Aiming to avoid these drawbacks, the researchers created KFD2-rPAc, which induced fewer systemic inflammatory responses in animal trials, among other effects. Although there is still a long way to go until a vaccine for use in humans will be available, the characteristics of KFD2-rPAc make the protein a promising vaccine candidate against dental caries, the researchers concluded.

The results were published in a paper titled “Second-generation flagellin-rPAc fusion protein, KFD2-rPAc, shows high protective efficacy against dental caries with low potential side effects” on 11 September in the Scientific Reports journal.