Study analyses MB2 root canal prevalence among world population

By DTI

LISBON, Portugal: Previous research has shown that endodontic treatment failure in maxillary molars can result from missed second mesiobuccal (MB2) canals. However, an MB2 canal is present in as many as 95 per cent of maxillary molars. In a recent study, a group of researchers from the University of Lisbon’s dental school analysed the worldwide prevalence of the MB2 root canal to understand its possible relation to sex, age, side and root configuration.

In an interview with Dental Tribune International, lead author Dr Jorge Martins explained how he and his team went about the study. Over the course of ten months, 21 observers from 21 countries and five continents were involved. They were calibrated to achieve a similar CBCT assessment methodology and instructed to collect data from 250 maxillary first molars from previous examinations. Intra- and inter-rater reliability tests were performed. The sample included 5,250 molars and was defined by way of a preliminary trial. Data collected included MB2 presence, sex, age, side, number of roots per tooth, and mesiobuccal root configuration.

“The calibration of the observers was done through sharing very strict written criteria, images and a tutorial video with the step-by-step assessment methodology that each one had to perform,” Martins said. “Our main goal was to make sure everyone was assessing the morphology the same way. In the end, we shared ten CBCT scans of 20 maxillary first molars among everyone and everyone performed their analysis so that we could perform some reliability tests of the group involved before going to the field. All this sounds easy, but it took a few hundred emails between the research team and observers to achieve the calibration.”

In the end, the difficult work paid off as the researchers made interesting findings: the worldwide CBCT-assessed MB2 prevalence was 73.8 per cent, ranging from 47.0 per cent in Venezuela to 97.6 per cent in Belgium. The prevalence in males and females was 76.3 per cent and 73.8 per cent, respectively. Significantly higher MB2 proportions were found in younger patients and three-rooted molar configurations. Overall, the MB2 prevalence in the analysed regions varied widely. The differences may be associated with specificities within each region, but also patient demographics, according to the researchers. Males, younger patients and three-rooted configurations were associated with higher MB2 proportions.

As to what these findings mean for endodontists and patients, Martins said: “It has been proven previously that the maxillary molar MB2 root canal is the one that more commonly is forgotten or not identified in endodontic treatment. These results show some influence of demographic factors in this anatomy prevalence, and that may be used as preoperative information that may anticipate more complex maxillary molar morphologies.”

The study, titled “Worldwide analyses of maxillary first molar second mesiobuccal prevalence. A multicenter cone-beam computed tomographic study”, was published online in the Journal of Endodontics on 19 September 2018 ahead of inclusion in an issue.

Smoking weakens mechanisms needed to fight pulpitis, study finds

By DTI

CLEVELAND, U.S.: The negative health impacts of smoking are widely known; however, few have researched its consequences regarding endodontics. In a new study led by scientists at the Case Western Reserve University School of Dental Medicine, Cleveland, researchers have found that smoking weakens the ability of dental pulp to fight illness and disease.

Speaking about the research, Dr. Anita Aminoshariae, associate professor of endodontics and director of Predoctoral Endodontics at Case Western, said: “That might explain why smokers have poorer endodontic outcomes and delayed healing than nonsmokers. Imagine TNF-α [tumor necrosis factor α] and hBD-2 [human beta defensin 2] are among the soldiers in a last line of defense fortifying a castle. Smoking kills these soldiers before they even have a chance at mounting a solid defense.”

In the study, the researchers set out to further understand why smokers have a greater possibility of developing periodontal disease and are nearly twice as likely to require root canal therapy.

From the pulp chambers of 32 smokers and 37 nonsmokers, all diagnosed with either normal, symptomatic irreversible pulpitis or asymptomatic irreversible pulpitis, the team collected samples and measured the interleukin (IL) 1β, TNF-α, hBD-2 and hBD-3 levels. “We hypothesized that the natural defenses would be reduced in smokers; we didn’t expect them to have them completely depleted,” explained Aminoshariae.

According to the study’s results, pulpal concentrations of TNF-α and hBD-2 were significantly lower among smokers, whereas there was no significant difference in IL-1β or hBD-3. Two-way analysis of covariance also revealed that smoking status, not endodontic diagnosis (pulpal status), significantly affected TNF-α and hBD-2 levels.

Although the study results provide yet another argument against smoking, an encouraging finding of the research was that two of the patients in the study who quit smoking experienced a return of the defense mechanisms needed to fight pulpitis.
GOthenburg, Sweden: The picture is becoming clearer regarding the chronic oral pain condition known as burning mouth syndrome (BMS), which mainly affects women who are middle-aged and older. A scientist at Sahlgrenska Academy at the University of Gothenburg has reported results on dissertation work that is part of a larger research project aimed at finding a model for BMS that can facilitate diagnosis and treatment in the future.

BMS affects approximately 4 per cent of the Swedish population. The condition is characterised by a burning sensation of the oral mucosa in a person with otherwise apparently normal oral health. The tongue is most often afflicted, but the palate, lips and gingivae may also be affected. Other common symptoms include xerostomia and altered taste perception, such as a bitter or metallic flavour in the mouth.

In her doctoral dissertation on oral microbiology and immunology at the Institute of Odontology, Dr Shikha Acharya connected clinical findings and self-reported findings from questionnaires from patients with BMS about their symptoms and background (other diseases, use of medications, etc.) along with saliva-related factors. These were compared with a sex- and age-matched control group.

The researcher found that 45 per cent of the BMS patients had altered taste perception and 73 per cent experienced burning or stinging or a combination of the two, but stinging and numbness also occurred. In addition to BMS, the examination of the study participants showed a higher incidence of other types of diseases, use of more medications, proneness to bruxism and more allergies than the control group. However, more advanced analyses showed that BMS was strongly associated with self-reported skin disease and subjective oral dryness.

That the BMS patients reported that they suffered considerably more from skin disease and skin problems, compared with the control group, is a new finding. The study also found that mucin proteins in BMS patients’ saliva were altered and contained lower amounts of carbohydrate structures that affect the oral cavity’s immune system, constituting another novel finding.

“Our hope is that the new findings will contribute to the development of objective diagnostic criteria and effective individualised treatment that are currently lacking. It’s important because the afflicted patients often feel that their surroundings and health care professionals doubt their ailment,” explained Acharya.