

Introduction

The regular use of cannabis has grown dramatically in recent years and with it, there has been much debate and controversy as to the potential benefits and harms to overall health. Regular use is associated with dizziness, dry mouth, nausea, and somnolence². However, it has also been shown to improve quality of life (QOL) of certain patient populations being treated for debilitating disease¹⁶. Not to mention that there have been claims that components of cannabis are anticariogenic and may be beneficial to caries control. The objective of this investigation was to determine how smoking cannabis (marijuana) impacts oral health outcomes based on the best available evidence.

Clinical Appearance

Figure 1 - Case 1: Anterior view. Note the enlarged and erythematous papillary and marginal gingiva.



Figure 4 - Case 1: Nicotinic stomatitis-like lesions of the palate.



Figure 6 - Case 2: Lingual view of mandibular anterior teeth. Note the diffuse gingival enlargement and nodular appearance of the gingiva.



Figure 5 - Case 2: Anterior view. Note the enlarged and erythematous gingival margins. Maxillary attached gingiva has a nodular or "pebbly" appearance.



Images taken from Rawal et al.⁹ (2012)

Periodontal Impact

There is a strong level of evidence indicates positive association of cannabis use with periodontal disease. Several case reports have shown chronic marijuana users develop enlarged marginal and papillary gingiva in a pattern similar to phenytoin-induced gingivitis⁹. Broad-based clinical studies have also shown that chronic marijuana users have increased pocket depths when compared with nonusers¹². However, it may also be noted that there is commonly overlap among cannabis smokers and tobacco smokers as well as other drug abuses. This has led to further studies trying to elucidate whether one substance causes more damage than the other. Fawad et al. utilized a cohort study and found that marijuana- and cigarette smokers have similar periodontal status but the immunoinflammatory response, as measured by IL-17 and IL-23 markers may be worse in marijuana smokers³. Another systematic review of periodontal parameters – specifically clinical attachment loss (CAL) – found that CAL was worse in chronic marijuana smokers and appears to follow a dose-dependent course⁷. Finally, a prospective study following patients from birth to age 32, found increased incidence of periodontal disease among marijuana smokers, when controlled for tobacco use¹⁵.

Head and Neck Cancers

Head and neck cancers relating to smoking cannabis have been historically difficult to distinguish from those caused by tobacco smoke. Due to the overlap in other risky behaviors, isolating the impact of cannabis presents challenges in differentiating confounding variables. However, marijuana smoke has been shown to contain aromatic hydrocarbons, benzopyrenes, and nitrosamines – associated with dysplastic changes in buccal epithelium and premalignant lesions such as erythroplakia and leukoplakia¹⁷. Additionally, marijuana has been shown to deposit 50% higher tar, a known carcinogenic substance, in the respiratory tract than tobacco. Patients also have notably higher prevalence of leukoedema, though no specific clinical relevance has been observed¹⁵. The highest prevalence of cancers by location associated with marijuana smoking, controlled for alcohol and tobacco use, were squamous cell carcinoma (SCC) of the larynx (22.9%) and tongue (19.2%)¹⁷. Additionally, epidermal growth factor receptor (EGFR), a key onco-protein associated with head and neck SCC, has been shown to be overexpressed in adolescent marijuana smokers¹.

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Oral Manifestations

The main component sought after for those smoking marijuana is tetrahydrocannabinol (THC), which is responsible for the main psychological effects, such as heightened sensory perception, feeling of relaxation, and increased appetite. Smoke from cannabis cigarettes contains carbon monoxide, bronchial irritants, tar, and other carcinogens. Long term users present with symptoms of bronchitis – coughing, wheezing emphysema¹⁶. Higher risk of pulmonary effects due to different mode of inhalation from tobacco smoking – deep inhalation results in 1/3rd more tar retained in respiratory tract¹⁶. Ulceritis and nicotinic stomatitis appear to be the most common oral manifestations seen in chronic users⁹. There has been some evidence that another component of cannabis, namely cannabidiol (CBD) has been shown to have beneficial effects on oral manifestations – anti-inflammatory and antioxidative, resolving oral mucositis⁹. However, this doesn't appear to have offset the negative clinical effects seen in most studies.

Risks of Procedure

Use of local anesthetics containing epinephrine pose risks of prolonged tachycardia in patients already under acute intoxication. No studies were found directly implicating cannabis smoking as a cause of medical emergencies in the dental office, though this may be an interesting topic to evaluate in future studies. There has also been concern raised over the therapeutic use of cannabis amongst adolescents and individuals predisposed to psychosis¹⁵. Patients may experience greater anxiety and dysphoria and due to parasympathetic response, may be more likely to undergo syncopal episodes¹⁶. These types of potential medical emergencies warrant further evaluation. Legal implications also need to be considered as patients cannot properly consent to major procedures while intoxicated. Many patients are not aware of this however, and may seek dental treatment while intoxicated specifically to avoid having anxiety about the procedure, unaware of the potential risks physical, mental, or legal.

Caries Risk

Xerostomia is a side effect of cannabis use, lasting 1-6 hours, leading to increased caries risks for chronic users². The impact of cannabis on cannabinoid receptors within large salivary glands reduces salivary flow by dampening parasympathetic activity¹⁵. As an appetite stimulant, chronic cannabis use encourages increased snacking behaviors which may lead to higher caries risk. Several studies have shown that in comparing groups of tobacco smokers, those that also smoke cannabis had higher rates of smooth-surface caries^{11, 2}. Part of this is explained by changes in hygiene trends: cannabis smokers tend to not brush as regularly as nonusers.

In aging communities across America, cannabis use has increased dramatically. These populations are particularly vulnerable to increased caries risk that may be associated with cannabis use since they have been shown to undervalue preventive dental care⁵.

Therefore it is imperative to understand and follow changing health behaviors of different populations and for clinicians to make patients aware of potential side effects associated with cannabis use.

Head and Neck Cancers

Table 4 Estimated combined effects (OR and 95% CI) of lifetime marijuana use (ever versus never) and each of these potential modifiers (cigarette smoking, heavy alcohol use, and mutagen hypersensitivity) on the risk of head and neck cancers by covariates selected for adjustment

| Potential modifier | Marijuana use | No. of cases | No. of controls | No. of covariates (crude) | Covariates | |
|-----------------------------------|---------------|--------------|-----------------|---------------------------|-----------------------|--------------------------|
| | | | | | Pack-years of smoking | Pack-years smoking plus* |
| Smoking history | Never | 36 | 56 | 1.0 | 1.0 | 1.0 |
| | Quit | 34 | 62 | 1.2 (0.6–2.2) | 0.4 (0.2–0.99) | 0.4 (0.2–0.99) |
| | Current | 84 | 37 | 4.9 (2.3–9.0) | 1.7 (0.7–3.7) | 1.8 (0.6–4.8) |
| | Never | 2 | 5 | 0.9 (0.2–4.7) | 0.9 (0.2–4.7) | 0.7 (0.1–5.5) |
| Quit | Yes | 8 | 9 | 1.9 (0.7–5.5) | 0.8 (0.3–2.7) | 2.1 (0.5–8.3) |
| | Current | 14 | 2 | 15.1 (3.2–71) | 9.7 (1.1–83.5) | 18.8 (1.7–204) |
| Current smoking | No | 60 | 118 | 1.0 | 1.0 | 1.0 |
| | Yes | 84 | 37 | 4.5 (2.7–7.3) | 3.0 (1.7–5.3) | 3.6 (1.7–7.4) |
| | No | 10 | 14 | 1.4 (0.6–3.4) | 1.3 (0.5–3.2) | 2.6 (0.8–8.0) |
| | Yes | 14 | 2 | 13.8 (3.0–63) | 16.3 (2.0–131) | 36.1 (3.6–358) |
| Alcohol (drinks/month) | <100 | 90 | 132 | 1.0 | 1.0 | 1.0 |
| | ≥100 | 51 | 14 | 5.3 (2.8–10.2) | 4.1 (2.0–8.3) | 4.3 (2.0–9.3) |
| | <100 | 14 | 15 | 1.4 (0.6–3.0) | 1.6 (0.7–3.8) | 2.7 (0.96–7.5) |
| | ≥100 | 10 | 2 | 7.3 (1.6–34.3) | 5.9 (1.3–30.4) | 9.6 (1.6–56.8) |
| Mutagen sensitivity (breaks/cell) | <1 | 30 | 91 | 1.0 | 1.0 | 1.0 |
| | ≥1 | 46 | 28 | 5.0 (2.7–9.3) | 6.3 (2.9–13.4) | 6.1 (2.4–15.3) |
| | <1 | 6 | 9 | 2.0 (0.7–6.2) | 2.2 (0.5–9.4) | 1.1 (0.2–7.4) |
| | ≥1 | 10 | 2 | 15.2 (3.1–73) | 15.6 (2.9–84) | 77.1 (7.2–826) |

* Adjusted for age (continuous variable), gender (male = 0, female = 1), race (white = 0, non-white = 1), education (<high school = 0, college = 1, >college = 2), heavy alcohol use (<100/month = 0, ≥100/month = 1), and passive smoking (no = 0, yes = 1).
Data provided from article by Zhu et al.¹⁸

Conclusion

Cannabis smoking is on an upward trend, and with an increasing number of states legalizing recreational use, it is with utmost certainty that oral health care providers will need to manage the sequelae. There are active campaigns supporting the therapeutic use of CBD products and some evidence to support this¹⁴, but in some ways this has sidetracked from the risks associated with smoking cannabis products. Chronic use of marijuana, particularly while smoking, increases risks of periodontal disease, and shows an association with increased caries and head and neck cancers. Clinicians need to be aware of potential side effects so that they can guide patients accordingly in how they understand and manage their use of this substance and what it could mean for their overall health.