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Oral health implications of increased cannabis use among older adults: Another public health concern?

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Abstract

Prevalence of cannabis use among older Americans (aged ≥ 65) appears to be rising, and emerging evidence associates cannabis use with several oral diseases. The burden of oral diseases among older Americans is great, but literature discussing potential implications of increasing rates of cannabis use and the oral health of older persons is lacking. This paper explores the latest trends in prevalence of cannabis use among older Americans and summarizes the literature on the oral health status of older adults and oral effects of cannabis use, and considers broad implications for oral health and public health policy and future research. Further studies on the effects cannabis use on the oral health of older adults are needed. Future research should investigate older subjects' susceptibility to cannabis-related oral diseases, as well as the proportions that develop disease. Policymakers may wish to tackle barriers to access of dental services for the older population, or target subsets of the population that suffer from comparably higher rates of oral diseases, while dental professionals may require training on managing underlying substance use behaviors in addition to clinical oral manifestations.

Keywords

Oral health; geriatrics; marijuana; cannabis

Introduction

The United States (US) population is aging at an unprecedented rate, with the proportion of older adults—herein defined as ages ≥ 65—projected to spike from 13% in 2010 to 20% by 2030, roughly translating to over 72 million people (United States Census Bureau, 2016, 2017). At such a voluminous scale, coupled with the fact that older individuals commonly suffer from multiple morbidities, this segment of the population is set to profoundly challenge the American health system economically and in terms of access to and delivery of care. It is important, then, that sound policy and decision-making take into consideration the health of the older population.

As an inseparable component of general health, oral health is essential to good systemic function and overall quality of life (US Department of Health and Human Services, 2000). This is particularly true of older adults, who suffer from considerably higher rates of oral diseases such as dental caries (tooth decay), edentulism (complete loss of natural permanent teeth), periodontal diseases (infections affecting structures surrounding the dentition), and oral cancers (Petersen & Yamamoto, 2005). Furthermore, poor oral health is linked to several diseases associated with aging, including cardiovascular disease and diabetes (Leite, Marlow, & Fernandes, 2013; Meurman, Sanz, Janket, 2004). Cannabis use has been implicated as a potential risk factor for several oral diseases, and recent findings derived from nationally representative studies show that prevalence of cannabis use among older adults has been significantly rising. However, there is a dearth of research exploring the impact of increased cannabis use on the oral health status of older adults. This knowledge gap can be problematic insofar as it constrains suitable care and effective policymaking for a changing demographic that is demonstrating higher rates of substance use in general (Mattson, Lipari, Hays, & Van Horn, 2013). As such, this brief report summarizes the oral health status and recent trends in cannabis use among older Americans and discusses potential implications for oral health and public health policy in an effort to guide future research efforts.

Trends of cannabis use among older adults

Cannabis is among the most commonly used drugs world-wide, and the third-most used by older adults in the US after alcohol and tobacco (Joshi & Ashley, 2016). National findings have demonstrated that the most notable growth in rates of any type of cannabis use (i.e., medicinal or recreational) occurred among Americans aged 65 or older. In building upon Han et al.'s findings (Han et al., 2017), we used National Survey on Drug Use and Health (NSDUH) data to estimate annual prevalence of past-year use among adults aged 65 or older from 2006 through 2015 (Center for Behavioral Health Statistics and Quality, 2015). The results suggest that the overall pattern of cannabis use among older adults has continued trending upwards (Figure 1), with prevalence of past-year use increasing from 0.56% in 2006 to 2.44% in 2015 (linear trend $p < .001$), or a relative increase of 336%. Given that the population of older Americans in 2015 was estimated at 47.8 million (United States Census Bureau, 2017), a prevalence of 2.44% represents approximately 1.2 million older cannabis users. With the older American population projected to reach 72.8 million by 2030 (United States Census Bureau, 2017), even a conservative prevalence estimate at 2.44% corresponds to a sizeable 1.8 million elderly cannabis users. However, should prevalence continue to increase to 4% in 2030, we estimate that some 2.9 million elders will be cannabis users.

The increase in cannabis use may be attributable, in part, to higher rates of substance use demonstrated by 'Baby Boomers'—the first generation to popularize cannabis during the late 1960s—even as they age (Kuerbis, Sacco, Blazer, Moore, 2014), and it appears that the majority of current older cannabis users first used during adolescence (Han et al., 2017). Since most of this generation has yet to reach age 65, it is conceivable that the upward trend will continue, perhaps to be further influenced by shifting attitudes and growing support for the legalization of marijuana. For example, a recent study reported that the volume of Medicare prescriptions for painkillers and other common drug classes has dropped

significantly across the 17 states that introduced new medical marijuana laws, which may be indicative of a changing landscape more conducive to greater cannabis use among elders (Bradford & Bradford, 2016).

Oral health status of older adults

As a cohort, older adults suffer from a very high prevalence of oral diseases. Over 96% of older Americans have had a cavity, and 1 in 5 has untreated tooth decay (Dye, Thornton-Evans, Li, & Iafolla, 2015). Similarly, 1 in 5 is completely edentulous, while over 70% suffer from periodontitis (Yellowitz & Schneiderman, 2014). Age-specific rates for oral cancer—among the most painful types of cancer (Connelly & Schmidt, 2004)—progressively increase with age, with most cases occurring among those aged 60 or older (Petersen & Yamamoto, 2005). As a whole, oral diseases are problematic because they greatly reduce quality of life for older adults, given that simple functions of daily life—speaking, smiling, socializing, and eating—necessitate a healthy, well-functioning dentition.

The high burden of oral diseases in the older population is a multifaceted problem that is attributable to physiological, social, and behavioral factors. For example, the physical, sensory, or cognitive impairments associated with aging can hinder self-care of oral hygiene (Petersen & Yamamoto, 2005; Yellowitz & Schneiderman, 2014). Oral problems may be exacerbated by the fact that many older adults appear to undervalue the importance of preventative dental care (Yellowitz & Schneiderman, 2014). Additionally, old age is often associated with being disabled, homebound, or institutionalized (e.g., living in nursing homes), which are themselves risk factors for poor oral health (Griffin, Jones, Brunson, Griffin, & Bailey, 2012). Financially, most older Americans are unaware that Medicare excludes dental services from coverage, and consequently had not allocated adequate savings for dental care or insurance (Raphael, 2017). Furthermore, older patients are likely to be taking multiple medications, many of which cause dry-mouth as a side-effect (Dagli & Sharma, 2014). Because saliva plays a crucial role in maintaining oral pH, reducing bacterial growth, and providing key minerals for the remineralization of teeth (Brosky, 2007; Griffin et al., 2012), dry-mouth greatly increases the risk of developing caries and oral infections. Further still, oral problems are often exacerbated by gingival recession, which also occurs with aging and exposes areas of tooth structure more prone to decay (Selwitz, Ismail, & Pitts, 2007). Finally, the dentition becomes less sensitive to pain with age, thereby predisposing older adults to worse oral health as they often only seek professional care after experiencing pain or discomfort (Martin, Freedman, Schoeni, & Andreski, 2009).

Oral health implications of cannabis use

Evidence suggests that cannabis use can have several adverse health effects on the oral cavity. For instance, it has been shown that cannabis users who also use tobacco presented clinically with a significantly higher incidence of caries on smooth tooth surfaces compared to tobacco-only users (Cho, Hirsch, & Johnstone, 2005; Schulz-Katterbach, Imfeld, & Imfeld, 2009). Smooth surface decay is concerning because such surfaces are typically easy to maintain with regular oral hygiene care methods. Behaviorally, cannabis users were found to brush their teeth less frequently than tobacco-only users and make less frequent visits to

the dentist (Schulz-Katterbach et al., 2009). The dietary patterns of cannabis users may also facilitate tooth decay, given that THC—the main psychotropic agent in cannabis—is an appetite stimulant that inclines users to consume greater amounts of cariogenic (i.e., decay causing) foods (Jager & Witkamp, 2014; Joshi & Ashley, 2016). Importantly, cannabis use has been shown to cause xerostomia (dry-mouth) in a vast majority of users, with effects lasting between 1–6 hours after use (Cho et al., 2005; Joshi & Ashley, 2016; Schulz-Katterbach et al., 2009). Dry-mouth is widely regarded as a strong risk factor for dental caries (Brosky, 2007), and the activity of cannabis compounds on cannabinoid receptors in the large salivary glands has been shown to reduce parasympathetic activity and, consequently, salivary flow (Prestifilippo et al., 2006; Versteeg, Slot, Van Der Velden, & Van Der Weijden, 2008).

Numerous studies have found a direct relationship between cannabis use and periodontal diseases. For example, a recent study found that long-term cannabis use up to 20 years is associated with poorer periodontal health in young adults, even after controlling for tobacco use, childhood health, and childhood socioeconomic status (Meier, Caspi, Cerdá et al., 2016). Although chronic periodontitis generally presents with age, other studies have also found that periodontitis may occur at earlier ages in cannabis users when compared to the general population (Shariff, Ahluwalia, & Papapanou, 2017; Thomson, Shearer, Broadbent, Foster Page, & Poulton, 2013; Zeng et al., 2014). Clinically, frequent cannabis use (using at least once per month for the past 12 months) is associated with deeper periodontal pockets, greater attachment loss, and a higher risk of having severe periodontitis (Shariff et al., 2017; Thomson, Poulton, Broadbent et al., 2008). Severe periodontitis encompasses problems that are themselves associated with aging (e.g., bone destruction and tooth loss) and can complicate suitable treatment options (Cochran, 2008).

Some studies also suggest a potential relationship between cannabis use and oral and neck cancers. Cannabis smoke has been associated with various lesions of the oral mucosa such as leukoplakias and erythroplakias, which have the capacity to develop into malignant neoplasias, potentially placing users at higher risk of developing oral cancers (Cho et al., 2005; Rawal, Tatakis, & Tipton, 2012). However, it is worth noting that other studies have not found a significant association (Osazuwa-Peters, Adjei-Boakye, Loux, Varvares, & Schootman, 2016).

Points for consideration

As health systems around the world prepare for the increased economic and health burden that the older segment of the population is anticipated to impose, it is important not to overlook their oral health status. Improved oral health is a key component of good public health, given the tremendous global burden and considerably reduced quality of life imposed by oral diseases. Indeed, as the fastest growing age cohort, older adults also suffer from a very high prevalence of oral diseases, and hence represent an important demographic towards which appropriate health policy should be geared. National-level data show that cannabis use is trending upwards among older Americans, possibly signifying an additional public health concern with a potential to exacerbate the geriatric burden on health systems. At the very least, it gives rise to several relevant questions that warrant further research.

The current literature suggests that frequent or long-term cannabis use is significantly associated with dental caries and periodontal disease, though additional studies to corroborate findings or elucidate etiology would be welcomed. Similarly, future research on the specific mechanisms of action by which cannabis use leads to periodontal disease or oral cancers will better inform clinically suitable treatment plans for patients as well as guide effective policy implementation for the larger population. Furthermore, the potential effects of cannabis use specific to the oral health of older adults remains largely unknown as the current literature is limited to adolescents or young adults. A potentially urgent research question for future studies, then, is whether older adults—who are generally frailer and burdened with multiple morbidities, oral or otherwise—are more susceptible to oral health problems due to cannabis use. Further still, future epidemiological studies should seek to determine the number and proportion of older cannabis users that develop or have oral diseases, as such published data is currently lacking. Granted, causal relationships may be complicated by the fact that older cannabis users appear to have initiated use during adolescence and commonly use other substances as well. Nevertheless, it remains an important area for research, given that studies have shown that oral diseases seem to occur earlier in cannabis users than the general population, and that dental caries and periodontitis are incurable chronic diseases. Future studies may also wish to investigate the quantity and frequency of cannabis use by older adults to determine whether current levels of consumption are harmful or satisfy criteria for abuse and dependence, given that aging is associated with several psychosocial problems that are known risk factors for substance abuse, such as bereavement, loneliness, and depression (Kuerbis et al., 2014). Moreover, prevalence of substance use disorders among older Americans has been increasing (Wang Andrade, 2013), so incipient concern for rates of cannabis use disorders seems warranted.

More broadly, the increasing prevalence of cannabis use among older adults may also have a wider impact across several stakeholders in the health sector. As a profession, dentistry would be directly affected and must be equipped to provide appropriate care to the growing numbers of medically impaired and behaviorally complex older patients. For example, dental professionals would need to be educated on the oral effects of cannabis use in order to identify suitable and effective treatment plans. It may also be more effective for dentists to target the underlying substance use behaviors in such patients, rather than solely treating their clinical manifestations. This would likely require interdisciplinary collaboration and knowledge transfer between other health-care professionals. As an additional consideration, older Americans are less likely to receive dental care largely due to financial constraints: over 70% of seniors in the US lack dental insurance, and approximately half do not visit a dentist (Raphael, 2017). Therefore, tackling this problem may also require larger efforts from policymakers and/or insurers in a manner that facilitates easy and affordable access to necessary dental services for this demographic. Policymakers may also consider targeting subsets of the older population: prevalence of periodontitis among persons aged 65, for example, is significantly higher among blacks and Hispanics, the indigent, and the less educated (Thorton-Evans et al., 2013). Further still, older adults are significantly less likely to be screened for substance use, often because of perceptions that they are unlikely to engage in such behaviors (Han et al., 2017). Therefore, health promotion and prevention programs may need to consider the identification and management of substance abuse

behaviors as well, including potentially novel roles that may be filled by dental professionals.

Conclusion

The prevalence of cannabis use—a potential risk factor for several oral diseases—has significantly increased among the older population in recent years. Coupled with the unprecedented rates at which the size of this cohort continues to grow, the future health burden imposed by this group may be even greater than initially anticipated. This raises several questions for future research and may have implications for numerous stakeholders involved in public health and policy.

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Figure 1.
Prevalence estimates for self-reported past-year cannabis use among adults 65 years and older, United States 2006–15.