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Oral Health Considerations for Aging Patients Living with HIV/AIDS

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Oral Health Considerations for Aging Patients Living with HIV/AIDS

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ABSTRACT

People living with HIV/AIDS (PLWH) have an increased life expectancy due to advances in antiretroviral therapy. In 1996, the life expectancy for a 20-year-old living with HIV was 39 years. Today, it is >70 years. As life expectancy increases, PLWH are burdened with age-associated comorbidities. This paper reviews the interaction between aging and HIV and how it affects social, physical and oral health issues. The shift in demographics presents new challenges for clinicians in how to identify, address and manage these complex manifestations. This review summarizes how to approach HIV-related changes when providing care as a dental clinician.

Advances in antiretroviral therapies are allowing people living with HIV/AIDs (PLWH) to live longer than ever before.[1] Early initiation and increased effectiveness of antiretroviral therapy have increased the life expectancy of PLWH to nearly that of the general population.[2] In 2018, the majority of people in the United States with an HIV diagnosis were over 50 years old.[3] Given increased life expectancy and incident HIV infections in older adults, it is estimated that over 70% of PLWH will be over 50 years old by 2030.[4]

Antiretroviral therapy is recommended for all PLWH, but it is especially important for older PLWH, because they are more likely to present with comorbidities and a weakened immunologic response to treatment.[1] Current combined antiretroviral therapy (cART) for PLWH typically includes two nucleoside reverse transcriptase inhibitors with a third drug: an integrase strand transfer inhibitor; a non-nucleoside reverse transcriptase inhibitor; or a protease inhibitor with a pharmacokinetic enhancer.[1] The most recent data also support the use of a two-drug regimen: dolutegravir and lamivudine.[1] The most common cause of treatment failure is poor adherence to cART, so clinicians should identify factors, such as neurocognitive deficits or hormonal changes, that might cause older patients to miss doses.[1]

As the rates of morbidity and mortality decline, the prevalence of older PLWH increases, presenting a shift in demographics and a new set of challenges clinicians must face. The complex interaction between aging and HIV presents unique challenges for older PLWH, including social, physical and oral health-related issues. Dentists can play an important role in identifying these issues in older patients living with HIV, referring for appropriate care and services and mitigating oral symptoms and discomfort.

Social Issues Affecting Older PLWH

Oral health–related quality of life (OHRQoL), as measured by the well-validated and frequently used Oral Health Impact Profile, is

a measure of the perceived effect of oral health on physical and social functioning and self-image.[5] There is strong evidence indicating OHRQoL is most negatively affected by dental caries and periodontitis.[6] Older age, unmet dental needs, smoking, loneliness and depression are also associated with worse OHRQoL.[5] For PLWH, health-related quality of life is most negatively affected physically, followed by psychologically.[6]

Studies have shown that PLWH experience unmet dental needs twice as frequently as unmet medical needs, a problem exacerbated for patients without dental insurance.[10] PLWH who have been exposed to long-term antiretroviral therapy are more likely to experience medication-induced xerostomia, which leads to dental caries, as well as halitosis, candidiasis and gingivitis.[6] Recent data demonstrate that, in addition to decayed teeth, prosthodontics treatment needs and drug use have the most significant negative impact on OHRQoL for PLWH.[7]

OHRQoL is negatively impacted by aging, as dental problems that inhibit chewing and negatively impact esthetics are more common in older patients.[5] Older PLWH are also more likely to present with comorbidities, which are also associated with lower health-related quality of life and poorer oral health.[8] Given the importance of oral health in daily functioning, socialization and nutrition, there should be an increased emphasis on early preventive dental care for older PLWH, such as reducing levels of plaque.[9]

Depression and loneliness are major issues for older patients living with HIV. Patients with depression have worse oral health indicators, such as DMFT index (the sum of the number of decayed, missing due to caries, and filled teeth in the permanent teeth) and mean missing teeth, and lower OHRQoL, even after controlling for age and comorbidities.[8] Older PLWH experience an estimated 39% to 58% higher rate of loneliness, which correlates with an increased likelihood of using cigarettes, alcohol or other substances.[4]

In addition to worsening quality of life and increased likelihood of depression, loneliness causes stress-induced cortisol dysregulation, which increases total peripheral vascular resistance and lowers cardiac contractility, contributing to increased odds of an early death.[4,11] Fortunately, loneliness is a modifiable condition; developing protective factors, such as wisdom, resilience and nostalgia, may help patients lessen the negative effects of loneliness.[4] Dentists may be able to identify elderly patients who are experiencing social isolation and loneliness and refer them to appropriate mental health and social resources.

TABLE 1

Select Educational and Support Resources for Clinicians and Patients

Resources for Clinicians		
HIV Guidelines	Screening guide to identify depression, social support, substance use, polypharmacy, and cognitive status, as well as tips for communicating with older patients	https://www.hivguidelines.org/hiv-care/selected-resources/quick-reference-guides/hiv-in-older-adults/
HIV and Aging Toolkit	Toolkit for clinicians who care for people aging with HIV; provides links to additional screening/assessmeent instruments and to programs and papers that offer clinically useful materials	https://aidsetc.org/sites/default/files/resources_files/NECA%20AETC%20Aging%20Toolkit%20%28NEW%29_V4.pdf
Resources for Patients		
HIV Service Locator	Find mental health, substance abuse, housing assistance, STI testing, and health service locations around the country	https://locator.aids.gov/
Collection of Resources for PLWH	Find resources relating to HIV care, housing, employment, and legal issues, as well as risk reduction tools and downloadable materials on living with HIV	http://www.cdc.gov/hiv/basics/livingwithhiv/resources.html

TABLE 2

Relative Risk of General Health Conditions and Related Dental Manifestations among PLWH

General Health Conditions	Among PLWH
Atherosclerotic cardiovascular disease	Increased risk[19]
Diabetes	Increased risk[21]
Osteoporosis	Increased risk[24-27]
Dental Manifestations	**Among PLWH**
Dental extraction and restoration complications	No difference[40,42,43]
Periodontal disease	Slightly increased risk[39,44,46]
TMD	Unknown
Alveolar bone loss and success rate of dental implants	No difference[31,37,38]

Certain behavioral risk factors also are associated with lower OHRQoL, including smoking, cocaine use and IV drug use.[9] Patients with a history of substance addiction and mental illness have reported experiencing stigma in the dental setting and stress and anxiety relating to dental treatments; patients reported more perceived stigma when they were negatively stereotyped, excluded from the decision-making process and felt powerless.[13] Conversely, patients reported positive experiences when their providers emphasized good communication, empathy and rapport building.[13] Dentists can reduce patient anxiety by involving patients in a shared decision-making process and may discourage patient drug use through motivational interviewing or harm reduction strategies.

Many older PLWH report experiencing both ageism and HIV-associated stigma.[14] Broadly speaking, older PLWH experience social discrimination, institutional discrimination and anticipatory stigma, with many of these patient reporting instances of rejection, stereotyping, violations of confidentiality and internalized ageism.[14] Understanding these, dentists can work to eliminate discrimination in the dental office and ensure that PLWH feel that they are in a safe, confidential environment.

Successful aging with HIV/AIDs requires resilience strategies and social and environmental support.[15] For older PLWH, there is a correlation between not working or volunteering and feelings of isolation, suggesting an opportunity for intervention for those without current employment.[16] Across all ages of PLWH, there is a high rate of reported unmet basic needs, relating to food, clothing or housing.[17] Studies have found that when basic needs are not met, more than one-third of HIV-positive people in the United States were unable to keep their medical appointments.[17] Dentists may play a crucial role in identifying patients who are lacking social support, basic needs or resiliency strategies and referring those patients to appropriate services, so that they might be able to thrive while aging with HIV/AIDs. Links to select educational and support service resources for the clinician and patient are provided in Table 1.

General Health Issues Affecting Older PLWH

PLWH commonly experience accelerated aging and comorbid conditions. The relative risk of general health conditions and related dental manifestations among PLWH, discussed below, is summarized in Table 2. Certain cART, such as zidovudine, didanosine and early protease inhibitors, can cause mitochondrial toxicity and other metabolic effects, such as insulin resistance, lipohypertrophy, lipoatrophy and dyslipidemia.[18] These metabolic effects contribute to chronic inflammation and hyperactivation of the coagulation system, leading to vascular and endothelial dysfunction.

The effects of ART (antiretroviral therapy) increase the risk of hypertension, venous thromboembolism, atherosclerosis and myocardial infarction.[19] Evidence suggests an association between periodontitis and cardiovascular disease.[20] While causality

has not been determined, research suggests that periodontal disease increases the risk of cardiovascular disease.[20] The effects of ART can also lead to an increased risk of insulin resistance and the occurrence of Type 2 diabetes mellitus.[21] Diabetes is associated with an increased risk of periodontal disease due to poor wound healing and increased susceptibility to infection. Diabetic patients with poor oral hygiene often have gingival inflammation, bone loss, deep periodontal pockets and periodontal abscesses.[22] Of the ART, protease inhibitors are most commonly associated with diabetes. Fortunately, the metabolic effects and hyperglycemia generally resolve once the protease inhibitors are discontinued.[21]

PLWH on ART are also more susceptible to chronic pain conditions. Myalgia and arthralgia are the most common symptoms, affecting 1% to 17% of PLWH.[23] Fibromyalgia syndrome (FMS) is a chronic pain syndrome that affects 20% of PWLH and is characterized by an increased pain response to non-painful stimuli. Patients may have chronic fatigue, difficulty concentrating, weakness and generalized pain.[23] Oral health providers should be aware that PLWH may also be at increased risk of temporomandibular joint disorders (TMD) because they are more susceptible to chronic musculoskeletal pain conditions. However, it has not been studied.

With a longer life expectancy, PLWH have a higher risk of osteoporosis, which is significantly expedited in women transitioning into menopause.[24] Premenopausal women are also at risk, although bone loss is more modest. Women with HIV have an estimated osteoporosis prevalence rate of 15% and a 58% higher fracture rate compared to the general population.[24,25] Accelerated bone loss has a multifactorial cause, including HIV, ART-related factors and traditional risk factors. Uncontrolled viremia can impact bone mineral density (BMD), mediated by effects of systemic inflammation on bone remodeling. HIV proteins increase osteoclastic activity and decrease bone formation by promoting osteoblast apoptosis. Inflammatory markers, such as tumor necrosis factor (TNF) and interleukin-6 (IL-6), also cause accelerated bone loss due to hyperactivation of osteoclasts.[26,27]

Certain ART, such as tenofovir disoproxil fumarate (TDF), are most closely associated with osteoporosis, although the cause is still unknown.[27] TDF may affect bone indirectly through proximal tubule toxicity, causing phosphate wasting and increased bone turnover.[27] The effects of TDF on BMD appear to be most significant during the first one to two years of therapy and eventually stabilize. A newer formulation of tenofovir, tenofovir alafenamide (TAF), has been shown to have less of an effect on bone loss. In several randomized trials of patients initiating therapy with either a TAF or TDF-containing regimen, those receiving TAF had smaller BMD decreases at the spine and hip at 48 weeks compared with TDF.[27] In subsequent trials, switching from a TDF regimen to a TAF regimen resulted in improved bone outcomes. Some data suggest protease inhibitors may have a negative effect on BMD, specifically, atazanvir and darunavir.[25]

Overall, bone loss is most accelerated during initiation of ART, with BMD decline of 2% to 6% during the first two years. Once a patient is on an established ART regimen, BMD seems to stabilize. This may be due to improvement of hormonal and nutritional factors with effective ART.[28] BMD scanning is recommended for all women aged 65 and older, postmenopausal women of any age, women transitioning to menopause with certain risk factors (including low BMI, prior osteoporotic fracture, use of glucocorticoids or current smokers), patients with fragility fractures, and all men aged 50 and older. Patients on ART are also recommended to supplement with calcium, vitamin D or bisphosphonates depending on their other comorbid conditions and baseline BMD score.[24,25]

Oral Health Issues Affecting Patients Living with HIV

Before cART, some of the most common oral problems for PLWH included xerostomia, oral candidiasis, oral hairy leukoplakia, herpes simplex virus (HSV) infections, human papillomavirus (HPV) infections, oral ulcers, oral Kaposi's sarcoma, salivary gland diseases, mucosal hyperpigmentation, gingivitis and periodontitis.[32,33,34]

A comprehensive review of oral health-related conditions among PLWH in the era of cART indicates that the prevalence of oral candidiasis, oral hairy leukoplakia and salivary gland diseases has, overall, decreased among PLWH since the widespread utilization of cART, while HIV-related oral ulcers, HSV and HPV infections, and Kaposi's sarcoma continue to be frequently reported.[35] It is important to note that the prevalence of many of the opportunistic oral infections among PLWH vary widely based on geography.[36] Developing countries with limited resources have reported no significant reduction of oral manifestation among their PLWH,[37] whereas developed countries with better access to cART have observed a change in epidemiology of HIV-associated oral conditions since 1992.[36]

Concerns regarding dental implant placements in PLWH have been raised, as PLWH may lack adequate means of healing after the dental implant is placed. A systematic review demonstrated that the immunocompromised condition of PLWH had negligible effect on the survival rate of dental implants, with 93.1% survival rate.[37] A recent study published a comparable success rate of dental implant treatment among PLWH to that observed in the control population in a 12-year follow-up period.[38]

Periodontal disease prevalence among PLWH has been frequently studied and debated with contradicting and inconclusive results. Recent studies have compared the prevalence of periodontitis in PLWH and healthy controls and found lower prevalence among PLWH (i.e., 16.4% in the former and 19.2% in the latter).[39,40] Similarly, no difference and complications were associated with dental extractions[42,43] and restorative procedures[40] among PLWH, suggesting the same sequence and standard of care when planning and rendering dental treatment for PLWH.

Although ART have reduced the overall prevalence of oral manifestation of HIV in the general population of PLWH, not

much is known about HIV-associated oral conditions that occur in the aging PLWH population.[32]

A recent study reported higher prevalence and severity of periodontitis in older PLWH who are male as compared to the age-matched controls.[44] This can be further explained by the observation that P. intermedia, one of the most potent periodontal pathogens associated with aggressive forms of periodontitis, is significantly more prevalent in older PLWH.[45] This finding suggests that periodontal disease in older PLWH can be attributed to the augmented bacterial burden in the oral cavity, coupled with altering patterns of microbiota composition. Dentists working with older PLWH should monitor their patients' periodontal health more frequently to prevent irreversible periodontal damage and initiate early therapy when the first signs of periodontal disease are observed.

The prevalence of chronic periodontal disease among older female PLWH has not yet been reported. Studies of periodontal disease progression among HIV seronegative postmenopausal women have shown that periodontal disease progresses more rapidly in women with a history of severe periodontitis or osteoporosis.[46] Since PLWH have a higher likelihood of developing osteoporosis, older women living with HIV/AIDS may experience accelerated alveolar bone resorption due to the decline of endogenous estrogen levels, which may affect dental implants.

Several studies have shown a weak association between skeletal BMD and mandibular alveolar bone.[29] In a recent cross-sectional study, it was determined that increased alveolar bone loss was due to external factors not related to HIV infection.[30] Another cross-sectional study concluded that there was no significant association between HIV, long-term use of ART and alveolar BMD. However, longitudinal studies should be performed in the future to monitor changes in the alveolar bone BMD.[31]

In addition, some studies have correlated an increased risk of human papillomavirus (HPV)-related oral and oropharyngeal cancers in PLWH with effective cART, possibly due to HIV-induced immunosuppression, aging and HIV/HPV synergistic effects.[47]

Conclusion

Dentists should understand these considerations when working with PLWH; monitoring alveolar bone status, in addition to probing depth and clinical attachment level, may be advised. Furthermore, dentists could engage in interprofessional collaboration to provide individualized and holistic care that fits the unique needs of the patient.

Queries about this article can be sent to Ms. Byington at era2125@cumc.columbia.edu.

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