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Integrating Oral Health into Primary Care

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Incorporating an oral exam into the physical evaluation will help identify oral inflammation, infection, and pathology in patients.

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Abstract

This article provides data on oral diseases as they relate to systemic health conditions. Research continues to identify biologic mechanisms that link oral diseases to systemic disease and vice versa. The Smiles for Life curriculum, developed for physicians, provides a systematic approach for incorporating an oral exam into your physical evaluation. Guidelines for the use of antibiotics for tooth pain and swelling, to prevent infective endocarditis, and for patients for total joint replacements are provided.

Introduction

In the 2000 Surgeon General's Report (SGR) on Oral Health, the first report on oral health promulgated by the Surgeon General, he articulated that oral health is essential to overall health.[1] Since the report, research has continued to support and identify new relationships between oral health and overall health.[1]

Oral diseases, such as periodontal (gum) disease, can have an impact on systemic health through the mechanisms of chronic inflammation and oxidative stress. CDC estimates that more than 45% of all U.S. adults over the age of 30 or 64.7 million adults have periodontal disease, with 30% having moderate periodontitis and 8.5% having severe periodontitis.[2] Smoking is the most significant risk factor for gum disease, however genetics, malnutrition, systemic disease, and local factors can contribute to patients developing gum disease. With more than 45% of U.S. adults having periodontal disease, it is estimated to be the number one cause of inflammation in the body followed closely by obesity.[2]

Obesity effects roughly 42% of U.S. adults. Self-reported data collected through the Behavioral Risk Factor Surveillance System (BRFSS) reported 35% of adults in Missouri were obese.[3,4] Obesity contributes to metabolic disorders such as diabetes mellitus (DM) type II. Research outlines a bidirectional relationship between DM and periodontal disease where treating periodontal disease improves blood glucose control in patients with DM, and well controlled DM improves periodontal health in patients.[5] The link between these two diseases is chronic inflammation and circulating pathogenic bacteria. Treatment options which can improve the oral health of the patient include scaling and root planning therapy to remove the biofilm and infected tissue below the gum surface, and/or periodontal surgery.[5]

Whether chronic inflammation is caused by periodontal disease, obesity, diabetes mellitus, or a combination, inflammation contributes to cardiovascular disease. Cardiovascular disease is the leading cause of death in the U.S.[6] Key risk factors for cardiovascular disease include high blood pressure, high LDL cholesterol, and/or smoking-three key risk factors for heart disease. Research by Bale, Doneen and Vigerust, reports that high-risk periodontal pathogens are a contributory cause of the pathogenesis of atherosclerosis.[7] Linking oral diseases to a patient's overall health helps support risk reduction strategies for patients which include smoking cessation, blood pressure control, and treatment for periodontal disease to decrease pathogenic bacteria and reduce inflammation.

The Smiles for Life Curriculum, developed for physicians, outlines a systematic approach to include an oral exam into the physical examination.The oral screening exam takes less than two minutes and can identify inflammation, infection, and malignancy.[8]

Case Example

Short Case Vignette

A 47-year-old male presents to your clinic for a three-month visit to evaluate a new medication he was prescribed for Type II diabetes mellitus (DM). Contributory medical history includes smoker (27 pack years), hypertension, and uncontrolled Type II DM. He is taking lisinopril, hydrochlorothiazide, insulin, liraglutide, and simvastatin. After your exam he mentions that his tooth is wiggling more when he eats, and he asks you to take a look. When you look inside you see a swelling around a tooth in the back right.

Discussion

The patient case reports a history of DM and hypertension, two out of three risk factors for cardiovascular disease, and signs and symptoms of periodontal disease. During the oral examination, you would expect to see signs of inflammation due to the patient's uncontrolled diabetes mellitus. Oral inflammation associated with chronic periodontal disease will present with red and swollen gingival tissues. Patients may often complain of their gums bleeding easily or it being uncomfortable or painful for them to brush, floss or even chew. With the patient case reporting a mobile tooth, it is likely that the latter is the case, and referral for dental care and treatment of this mobile tooth is recommended.

Odontogenic or tooth-related infections are the most common form of oral infections. Odontogenic infections result in throbbing pain, swelling, and potential purulence around the infected tooth. In this case example, when the swelling and purulence around a tooth is severe, the bone structure around the tooth is lost, making teeth become mobile.

In addition to the extraction of an infected tooth, antibiotics can be used to treat oral infections. To promote antibiotic stewardship, the American Dental Association has released guidelines for both medical and dental clinicians for treating tooth pain and swelling with antibiotics when dental care is and is not immediately available.[9] These guidelines use evidenced-based medicine, and recommend referral patterns for patients with signs of tooth related inflammation and infection. Table 1 illustrates the various published guidelines with recommendations for antibiotic use for prophylaxis and treatment of oral infections.

Prophylactic antibiotics prior to dental treatment are recommended for various systemic conditions such as cardiovascular disease (infective endocarditis) and post total joint replacement. The guidelines promulgated by the American Heart Association support the judicious use of antibiotics in patients with infective endocarditis.[10] In 2017, the American Association of Endodontists updated their guidelines for antibiotic use for oral infections.[11] Similarly, the American Academy of Orthopedic Surgeons developed guidelines for patients with post total joint replacement and have created an online resources for clinicians to help with prescribing prophylactic antibiotics for patients who are immunocompromised.[12]

Fungal infections in the mouth commonly occur among patients in long-term care facilities, with antibiotic therapy, and in patients with an immune deficiency associated with medication or systemic disease. Patient symptoms of an oral

Table 1 Resources for evidenced based use of antibiotics for dental prophylaxis and tooth pain and/or swelling

Resource Type	Dental Organization	Date Released	Citation
Prophylaxis			
Prophylaxis Recommendations for Heart Conditions	American Heart Association	2008	Wilson WR, Gewitz M, Lockhart PB, et al. Prevention of Viridans Group Streptococcal Infective Endocarditis: A Scientific Statement From the American Heart Association. Circulation 2021:Cir0000000000000969
Antibiotic Prophylaxis	American Association of Endodontics	2017	Ashraf F. Fouad, Chair, B. Ellen Byrne, Anibal R. Diogenes, Christine M. Sedgley and Bruce Y. Cha. Antibiotic Prophylaxis 2017 Update [Internet]. American Association of Endodontists; 2017.
Antibiotic Use in Endodontics	American Association of Endodontics	2017	Ashraf F. Fouad, Chair, B. Ellen Byrne, Anibal R. Diogenes, Christine M. Sedgley and Bruce Y. Cha. AAE Guidance on the Use of Systemic Antibiotics in Endodontics [Internet]. American Association of Endodontists; 2017.
Antibiotic Prophylaxis	American Association of Endodontics	2017	Ashraf F. Fouad, Chair, B. Ellen Byrne, Anibal R. Diogenes, Christine M. Sedgley and Bruce Y. Cha. AAE Guidance on Antibiotic Prophylaxis for Patients at Risk of Systemic Disease [Internet]. American Association of Endodontists; 2017
Prophylaxis Recommendations for Prosthetic Joints	American Dental Association	2015	Sollecito TP, Abt E, Lockhart PB, Truelove E, Paumier TM, Tracy SL, et al. The use of prophylactic antibiotics prior to dental procedures in patients with prosthetic joints. The Journal of the American Dental Association [Internet]. 2015 Jan [cited 2019 Jan 29];146(1):11-16.e8.
Editorial on Prophylaxis Recommendations for Prosthetic Joints	American Dental Association	2017	American Dental Association guidance for utilizing appropriate use criteria in the management of the care of patients with orthopedic implants undergoing dental procedures. Journal of the American Dental Association. 2017 Feb;148(2):57–9.
Treatment of Oral Disease			
Antibiotics for the urgent management of symptomatic irreversible pulpitis, symptomatic apical periodontitis, and localized acute apical abscess: Systematic review and meta-analysis-a report of the American Dental Association	American Dental Association	2019	Tampi MP, Pilcher L, Urquhart O, Kennedy E, O'Brien KK, Lockhart PB, Abt E, Aminoshariae A, Durkin MJ, Fouad AF, Gopal P, Hatten BW, Lang MS, Patton LL, Paumier T, Suda KJ, Cho H, Carrasco-Labra A. Antibiotics for the urgent management of symptomatic irreversible pulpitis, symptomatic apical periodontitis, and localized acute apical abscess: Systematic review and meta-analysis-a report of the American Dental Association. J Am Dent Assoc. 2019 Dec;150(12):e179-e216. doi: 10.1016/j.adaj.2019.09.011. PMID: 31761029; PMCID: PMC8098651.
Evidence-based clinical practice guideline on antibiotic use for the urgent management of pulpal- and periapical-related dental pain and intraoral swelling: A report from the American Dental Association	American Dental Association	2019	Lockhart PB, Tampi MP, Abt E, Aminoshariae A, Durkin MJ, Fouad AF, Gopal P, Hatten BW, Kennedy E, Lang MS, Patton LL, Paumier T, Suda KJ, Pilcher L, Urquhart O, O'Brien KK, Carrasco-Labra A. Evidence-based clinical practice guideline on antibiotic use for the urgent management of pulpal- and periapical-related dental pain and intraoral swelling: A report from the American Dental Association. J Am Dent Assoc. 2019 Nov;150(11):906-921.e12. doi: 10.1016/j.adaj.2019.08.020. PMID: 31668170.
Treatment of Infections in Pediatric Dental Patients	American Association of Pediatric Dentistry	2014	Council on Clinical Affairs. Guideline on Use of Antibiotic Therapy for Pediatric Dental Patients. American Academy of Pediatric Dentistry CLINICAL PRACTICE GUIDELINES [Internet]. 2014 Revised;37(6):289–91.
Recommendations for the non-surgical treatment of periodontal disease	American Dental Association	2015	Smiley CJ, Tracy SL, Abt E, Michalowicz BS, John MT, Gunsolley J, et al. Evidence-based clinical practice guideline on the nonsurgical treatment of chronic periodontitis by means of scaling and root planing with or without adjuncts. The Journal of the American Dental Association [Internet]. 2015 Jul [cited 2019 Jan 29];146(7):525–35.

Candida infection can include a burning sensation, cracked and irritated corners of the mouth, or irritation when a patient wears a denture. Oral fungal infections are treated with topical and systemic antifungal medications.

During the oral examination, you may observe oropharyngeal lesions that have the potential to be malignant. In the above patient case, while the patient didn't report a non-healing lesion or swelling, you noticed in the medical history that the patient has a history of smoking tobacco. Oral and pharyngeal cancers comprise 2.9% of all new cancer cases each year and result in 1.8% of all cancer deaths in 2020. From 2011-2016, the five-year survival rate for oral cancer is 66.2%, among the worst survival rates for all cancers.[13] Risk factors for oral and pharyngeal cancer include the use of alcohol, tobacco, the human papilloma virus (HPV). A key strategy for treating oral malignancy is early detection and referral for care.

Signs and symptoms of oral and pharyngeal cancer may include a non-healing lesion or ulcer in the mouth that is red, white, or red and white in color. Red and white (mixed) lesions present a greater concern. Patients with a difficulty swallowing or a recent change in their voice raise concerns for malignancy. HPV has been identified as a risk factor for oral cancer and currently about 72% of all oropharyngeal cancers are the results of an HPV infection. White, non-smoking males in their 40s and 50s are the most at risk for HPV-related oral cancers.[14] Current health promotion practices include having patients reduce the use of alcohol and tobacco, receive HPV vaccination, and regular screening of all patients for oral cancer, even those who are non-smokers.

Conclusion

Research continues to demonstrate the effect of oral diseases on overall health. Incorporating an oral exam into the physical evaluation will help identify oral inflammation, infection, and pathology in patients. Treating or referring these oral conditions/lesions and implementing risk reduction strategies can improve overall health in addition to improving a patient's oral health.

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Disclosure

None reported. **MM**