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REVIEW ARTICLE

Dentistry and Lyme Disease: what we currently know based on the available evidence

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ABSTRACT

Lyme disease (LD) is a serious and debilitating disease that has spread rapidly in the world. Signs and symptoms of LD can present in the orofacial region, which will prompt patients to see a dentist. This article reviews the manifestations of LD in the orofacial region and the role of dentists in potential multidisciplinary effort in the diagnosis of LD, as well as management of patients with LD that require dental treatment.

Introduction

Lyme disease (LD) is caused by different strains of the bacterium Borrelia species, that is carried by hardbodied Ixodes ticks to small mammals, birds, reptiles and larger vertebrate hosts. This serious and debilitating disease has spread rapidly in the world. In North America, Asia and Europe ticks are responsible for 90% of vector-borne diseases with 82% of tick-borne diseases being Lyme. LD is poorly understood, difficult to diagnose and treat effectively[13].

Some of the manifestations caused by LD will present in the orofacial region and can sometimes be confused with a dental problem. The aim of this manuscript is to review clinical manifestations of LD in the orofacial region, discuss the dental management of patients with LD and outline the importance of dental practitioners to work in collaboration with other health care workers to assist in diagnosing LD.

Lyme Disease manifestations in the orofacial region

Dental practitioners are the main resource to treat odontogenic pain. It is paramount to realize that not all pain entities presenting as a toothache are of odontogenic origin. The presenting toothache may be a heterotopic symptom of another disorder. A heterotopic symptom is perceived to originate from a site that is different from the tissue that is actually the source of the pain. Patients may present to the dental office with the belief that they are having a tooth related problem but the pain may be referred from a non-odontogenic site or be a manifestation of another disorder such as LD[9,19]. Dentists may recognize this in patients with unexplained toothache, that does not have the typical presentation in response to both pulpal and periapical tests and no significant findings during clinical and radiographic examinations.

Dental practitioners should become attuned to possible presentations, symptoms and patterns of LD, as well as its stages. Sudden unexplained neck or temporomandibular joint pain should be regarded carefully, particularly if patients live or visited an area with a high incidence of LD, and there are no other identifiable causes for their dental complaint or prior history that may point to a dental problem[8,5,1,6]. Detailed health history should always be taken and reviewed. Dental practitioners should consider LD when patients present to the office with its manifestations in the orofacial region, and may have been diagnosed with amyotrophic lateral sclerosis (ALS), multiple sclerosis (MS), Parkinson's disease, lupus, rheumatoid arthritis, fibromyalgia and chronic fatigue[15]. This is especially important in areas with a high incidence of LD. Below are some presentations of LD that can occur in the orofacial area and can be confused with dental pain.

HEADACHE

Headaches have been frequently experienced in patients with LD[1,5]. Neurovascular pains or headache disorders have qualities similar to pulpal pain, as they can be intense and pulsatile[9].

PERIPHERAL NEUROPATHY

Neuropathic pain arises from abnormalities in the neural structures, as a direct consequence of a lesion or disease affecting the

somatosensory system. Clinical examination usually reveals no somatic tissue damage, and the response to tissue stimulation is disproportionate to the stimulus[9].

Involvement of cranial nerves, particularly the seventh nerve (facial nerve), may be present in up to 50%-75% of all patients experiencing neurologic symptoms of LD[10]. When this nerve is involved, patients can present with facial, lip or tongue numbness or tingling[8,5,10,1].

PALSY

Facial palsy is a common presentation in patients with LD[1,5,11]. Facial palsy or Bell's palsy is a condition that causes sudden weakness in the muscles on one side of the face. The weakness makes half of the face appear to droop. Smiles are one-sided, and the eye on the affected side resists closing[10].

TEMPOROMANDIBULAR JOINT ARTHRALGIA

Temporomandibular joint arthralgia (TMJA) is joint pain from arthritis of the temporomandibular joint. TMJA has commonly been reported in patients with LD[1,5,17,20]. Typically, arthritis in the course of LD is accompanied by inflammation of the synovial membrane, and less often erosion and destruction of joint structures[17].

ACUTE PAROTITIS

Acute parotitis is caused by duct obstruction, infectious organisms, or inflammatory conditions. Patients with acute parotitis will present with sudden onset of painful lateral facial swelling, low-grade fever, malaise, and headache. Trismus may accompany acute parotitis[12]. There are limited reports of acute parotitis in patients with LD[11].

BURNING MOUTH SYNDROME

Patients with burning mouth, or burning tongue syndrome, usually exhibit no clinically detectable lesions, although symptoms of pain and burning can be intense and may be accompanied by altered taste and xerostomia. It may be caused by neuropathic alteration, which is common in patients with LD[12,6].

This is definitely not an inclusive list of manifestations of LD in the orofacial region, but these are the most common presentations discussed in the literature. It is also important to note that the diversity of Borrelia species that can cause human infection is greater in Europe, and differ from the species in North America, which are the areas that have more established reporting mechanisms. Strain differences seem to explain some of the variation in the clinical manifestations of LD in different regions. The most common complaint from patients with complex disseminated LD in North America is arthralgias, that tend to move around in the body over time. *B. burgdorferi* s.s. is very common in North America and demonstrates the strongest potential to damage joints[17,20]. In Europe facial nerve palsy is the typical presentation of early LD.[16] Practitioners around the globe need to be knowledgeable of these variances, which can assist them in a possible diagnosis.

Dental management of patients with Lyme Disease

Dentists can assist in the diagnosis of Lyme disease by collecting a thorough health history and identifying unusual symptoms when either a clear medical or dental condition is not present. There is scant literature on dental treatment of patients with LD. A few articles have presented information on approaches

and complications of dental treatment for these patients.

When patients are suffering from nonodontogenic pain, determining the source of pain can be challenging due to central sensitization channelling and poorly localized pain[3]. Unexplained pain may be triggered or exacerbated by palpation of soft tissues or percussion on teeth. Acute, nonlocalized, radiating pain, that patients describe as a toothache, has been reported by patients with LD[7,8].

In certain instances, antibiotics may need to be prescribed as an adjunct to dental treatment. However, practitioners should be aware that antibiotics may cause an exacerbation of LD related symptoms that may include fever, chills, rigor, hypotension headache tachycardia, hyperventilation, vasodilation with flushing, myalgia and exacerbation of skin lesions. This complication is known as Jarisch-Herxheimer reaction and tends to develop within 24 hours after antibiotic treatment. The symptoms tend to resolve within a few hours and consequently, interruption of antibiotic treatment is not required[4,5]. Caution must be exercised when prescribing antibiotics for patients that have been diagnosed with LD, and patients should be warned about potential side effects in their condition.

It has been hypothesized that dental treatment that affects connective tissues, such as periodontal treatment, root canal therapy and extractions, can exacerbate LD symptoms that can be difficult to manage. This exacerbation may occur even several years after the patient having contracted the disease[5,2]. Atraumatic techniques, whenever possible, should be employed during dental procedures, and patients should be informed of potential exacerbation of their symptoms following dental treatment. A consultation with their physician is warranted prior to the appointment if possible, to prepare for management of such exacerbations.

Conclusions

LD is a devastating multi-organ disease that is fast growing and spreading in the globe. It is paramount that all health care professionals engage in collaborations to help patients to be diagnosed, so they can receive timely and appropriate treatment. Dentists should be familiar with the presentations of the disease in the orofacial region and include LD in the differential diagnosis of nonodontogenic pain, especially if they practice in areas of high incidence of the disease. As dental treatment may need to be rendered in patients with LD, dentists and patients should prepare for possible LD symptoms exacerbation.

Conflict of Interest:

The author has no conflicts of interest to declare.

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