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Oral Manifestations of Neurological Disorders

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Abstract

Introduction

Orofacial region is the location for 30-40% sensory and motor nerves of the body. Oral cavity and central nervous system are close to. A large number of neurological disorders have orofacial manifestations. Patients with neurological disorders have to be treated with appropriate and precautionary approach, because they are patients with special needs. Since a dental practitioner can identify changes in the hard and soft tissues of the oral cavity, dentists are responsible for the early diagnosis of some neurological diseases. Neurological diseases with oral manifestation include neuromuscular diseases like Parkinson's disease, neurocutaneous diseases like Sturge-Weber syndrome and neoplasia of the orofacial nerves [1]. This article describes in brief the oral manifestations of few commonly encountered neurological disorders along with its dental management.

Oral Manifestations of Neuromuscular Disorders

Parksinson's disease

Parkinson's disease is a degenerative disorder of the central nervous system that can cause symptoms associated with the motor and nonmotor system. The nonmotor symptoms become more common as the disease worsens. Loss of striatal dopaminergic neurons cause motor symptoms like tremor, "cogwheel" rigidity, and bradykinesia. Neuronal loss in nondopaminergic areas result in nonmotor symptoms of sleep disorders, depression, and cognitive changes [3,4].

Risk factors

The risk factors for Parkinson's disease comprise of environmental exposure to pesticides, consumption of dairy products, trauma, and history of melanoma. Ascherio et al observed that smoking (nicotine), caffeine, and urate could be neuroprotective as they are negative risk factors and are beneficial in patients with early Parkinson's disease [5].

Clinical features

There are four cardinal features of motor symptoms are tremor at rest, akinesia (or bradykinesia), rigidity and postural instability. Nonmotor symptoms include neuropsychiatric features like apathy anxiety, panic attacks, and mood disorders, sleep disorders like insomnia, REM disorder, sensory dysfunction, pain, fatigue and dysautonomia [6].

Oral manifestations

Increased prevalence of caries and periodontal disease, xerostomia, sialo rhea and drooling, bruxism, orofacial pain, and altered taste sensation have been observed [7,8]. Rigidity of the jaws, reduced mobility of the tongue and jaw, and jaw tremors have also been reported [9]. Drugs for treatment of Parkinson's cause xerostomia which can lead to an increased prevalence of dental caries and taste impairment [10]. Pooling of saliva results due to dysphagia, decreased swallowing frequency and diminished lip closure [11].

Dental Management

Toothbrushes with the wider grip can be prescribed since they are handier and help with the overall grip and dexterity. Special anxiety or stress reduction techniques can be used in patients with exaggerated trembling, during treatment. Patients on dopamine can be treated in a supine position since they can experience hypotension [12]. High-speed evacuation of fluids is necessary for reducing the risk for aspiration oral and irrigation fluids [10]. South et al observed that gum chewing can reduce drooling [13]. Caries reduction can be done by application of fluorides and sealants wherever indicated [14]. Enameloplasty or mouth guard can prevent injury to patients with dyskinesis. Salivary substitutes can be given in patients with xerostomia [15].

Bell's palsy

Bell's palsy, also known as idiopathic seventh nerve paralysis, is as an acute-onset, unilateral and isolated lower motor neuron facial weakness [16]. The annual prevalence is between 11 and 40 per 100000 people [17]. Although its aetiology is unknown, possible theories regarding its development have been proposed. This includes anatomical location, ischemia, viral infection, inflammation and cold stimulation [18].

Risk factors

Environmental risk factors include smoking, Vitamin D, latitude and Epstein - Barr virus (EBV) infection. Patients with radiologically isolated syndrome have an increased risk of developing multiple sclerosis. White men are 40% more susceptible than African Americans [19-25].

Clinical features

The disease progression is characterized as relapsing-remitting, primary progressive, secondary progressive, progressive relapsing [26]. Diplopia, oscillopsia, nystagmus, facial sensory loss, ataxia, vertigo, dysarthria and bilateral internuclear ophthalmoplegia can be seen [15,26].

Oral manifestations

Trigeminal neuralgia, paraesthesia of lower lip and chin, facial palsy, inability to maintain oral hygiene, xerostomia and its associated complications have been reported [27,28].

Dental management

Elective dental treatment should not be done in patients during acute exacerbation [15]. Steroids, immunosuppressants, aspirin, and NSAIDs should be avoided as they increased risk of ulcer formation [29]. Supine position during treatment should be avoided as they increase the risk of pulmonary aspiration. Salivary substitutes, chlorhexidine mouth washes, fluoride application and varnishes can be used for oral hygiene maintenance [30].

Oral Manifestations of Neurocutaneous Disorders

Sturge-Weber syndrome

Sturge-Weber Syndrome also called Encephalotrigeminal Angiomatosis is a congenital disorder which occurs sporadically. Although aetiology is unknown, autosomal dominant somatic mutation has been suggested. This leads to overproduction of antigenic factors [31,32].

Clinical features

Port-wine birthmark, vascular malformation of the brain, intracranial leptomeningeal angioma and glaucoma are the characteristic features. Angiomas involving the facial skin along the ophthalmic and maxillary branches of the trigeminal nerve have also been reported [33- 35].

Oral manifestations

Oral manifestations include haemangiomas in the maxillary and mandibular gingiva, tongue, lips, and palate. Lesions in gingiva present as unilateral hyperplasia. This is because of an increase in vascular component and bleed following minimal trauma [36-38].

Dental management

Conservative or surgical approaches can be used for controlling bleeding in these patients due to increased haemorrhagic risk [38].

Tuberous sclerosis

Tuberous sclerosis complex (TSC) also known as piloia or Pringle-Bourneville phacomatosis, is a multisystemic neurocutaneous disorder. It is a genetic disorder of autosomal dominant inheritance with complete penetrance. It involves multiple organ systems including the skin, heart, nervous system, lungs and kidney [39]. The mutation involves the genes TSC1 and TSC2, which code for the proteins hamartin and tuberin respectively [40].

Clinical features

Diagnosis is based on the presence of symptoms. There are two groups of symptoms: major and minor criteria.

Major criteria

- Facial angiofibromas or forehead plaques
- Nontraumatic ungula or periungual fibroma
- Cortical tubers
- Cardiac rhabdomyoma
- Lymphangiomyomatosis
- Hypopigmented macules (more than 3)
- Shagreen patch
- Subepandymal nodules
- Subepandymal giant cell astrocytoma
- Multiple retinal nodular hamartomas
- Renal angiomyolipoma

Minor criteria

- Cerebral white matter radial migration lines
- Dental Pits (more than 14)
- Hamartomatous rectal polyps
- Bone cysts
- Multiple renal cysts
- Nonrenal hamartomas
- Retinal achromatic patch
- Confetti skin lesions
- Definite TSC- 2 major criteria or 1 major and 2 minor criteria
- Probable TSC- 1 major and 1 minor criteria
- Possibility of TSC- Only 1 major feature or 2 or more minor criteria without any major feature [41,42].

Oral manifestations

Fibrous hyperplasia of the gingiva, haemangiomas, bifid uvula facial asymmetry, cleft lip and palate, macroglossia, high arched

palate, delayed eruption of teeth, diastemas, and enamel pits [43-45].

Dental management

Restoration of the enamel pits, surgical excisions of the gingival hyperplasia should be done. Surgical correction of cleft lip and palate followed by speech therapy can be done. Frequent dental visits oral hygiene maintenance is necessary [46].

Von Recklinghausen's disease

Von Recklinghausen's disease is Neurofibromatosis type 1(NF1). It is a neurodermal dysplasia described by Friederich Daniel Von Recklinghausen in 1882. It is an autosomal dominant genetic disorder in the NF1 gene located at the 17q11.2 chromosome [47,48].

Clinic features

The characteristic feature is the presence of Café-au-lait spots, axillary and inguinal freckling, optic gliomas, Lisch nodules, neurofibromas, cognitive impairment, scoliosis, malignant tumours of the nerve sheath.

Oral manifestations

They include hard and soft tissue defects. Maxillary hyperplasia, maxillary atresia, malocclusions, impacted or missing teeth, gingival hyperplasia, pain and paraesthesia may be observed [50].

Dental management

Biopsies must be done to confirm histopathological features. Conservative or surgical management can be done in patients along with appropriate symptom alleviation.

Oral Manifestations of Neoplasia of the Orofacial Nerves

Neoplasia of orofacial nerves like neurofibroma, neurolemmoma, traumatic neuroma and malignant schwannoma can cause orofacial pain can arise due to nociceptive/somatic, inflammatory, neuropathic and visceral mechanisms [51]. Oro-facial metastases appear as rapidly growing lesions of the gingiva associated or as facial swelling involving the major salivary glands [52].

Conclusion

Dentist plays a pivotal role in providing complete health care to an individual. The dental treatment of patients with neurological disorders comprises of identification and diagnosis of the disease, risk factors followed by appropriate treatment and maintenance of oral hygiene.

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