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'Neuromuscular Disorders and Their Oral Health Considerations'-A Review

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Abstract **Review Article**

Neuromuscular disorders are a group of disorders that are associated with problems with the nerves and muscles in your body. The most common symptom among these disorders is the weakening of muscles. Moreover there is diminished functioning of major adaptive system that facilitates and controls major parts of the body. This article briefly reviews some of these disorders and highlights their clinical findings and oral health considerations.

Keywords: Neuromuscular Disorders, Oral Health Considerations.

INTRODUCTION

Neuromuscular disorders, in simple terms, are muscle impairment because of pathology in the associated nerves. They create an impact on the nerves that controls voluntary muscular activity. These disorders have a prevalence rate of 3% to 5% and the oral physicians have frequent encounters with them. They may manifest orally affecting the soft tissues changing the occlusion and appearance and so it is better to understand the oral health of the affected patients.

Neuromuscular diseases affecting Oro-facial region
Cerebrovascular disease/Stroke
Multiple Sclerosis
Bell's palsy
Myasthenia gravis
Parkinsonism

1. **Cerebrovascular disease**

They refer to disorders that cause damage to cerebral blood vessels due to impaired cerebral circulation.

Clinical aspects

Depending on size and location of affected brain region, they present with the following:

- Sensory and motor deficit
- Paresis in eye movements
- Visual defects
- Sudden headache
- Dizziness
- Nausea
- Seizures
- Impaired memory

Treatment

Management of acute stroke includes medical therapy to reduce bleeding or thromboembolic occlusion. Thrombolysis with intravenous tissue plasminogen activator (TPA) from 3- 4.5 hours after stroke onset.

Oral health Consideration

- Following stroke, patients may experience oral problems like masticatory and facial muscle paralysis, impaired taste sensation, diminished gag reflex and dysphagia which need to be managed.
- Maintenance of oral hygiene, replacement of missing teeth should be done.

- Blood pressure should be monitored to prevent stroke
- Patients with a history of stroke are usually using aspirin and warfarin, hence use of NSAIDs may increase the risk of bleeding and their long term use may reduce the protective effect of aspirin.
- Stress reduction during dental visits should be done for which pre-operative inhalation N_2O-O_2 is used [1].

2. MULTIPLE SCLEROSIS[MS]

MS is a relapsing remitting autoimmune inflammatory de-myelinating disease of the central nervous system

Clinical Features
- Age of onset is between 20-45 years
- Women vs Men ratio of occurence [2:1] [2]
- Features depend on areas involved[optic, brainstem, cerebellum, spinal cord]
- Diplopia, blurring, nystagmus
- Limb weakness-loss of strength, fatigue, gait problems
- Ataxia-cerebellar dysarthria
- Sensory impairment [parasthesia, hyperesthesia]

Treatment aspects
- Glucocorticoids[initial, acute exacerbation]
- IV dose of methylprednisolone 500-1000mg per day for 3-5 days [3]
- Mitroxantrone (Novantrone) –IV for reducing neurologic disability[4]

Oral Health Considerations
- Features may be similar to trigeminal neuralgic symptoms but there is absence of trigger zones
- Neuropathy of trigeminal nerve branches [burning, reduced sensation]
- Neuropathy of mental nerve [numbness of lower lip and chin]
- Facial weakness and paralysis
- Dysarthria (speech problems)
- Elective dental treatments should be avoided during acute exacerbation of MS
- May require dental treatment under GA
- Maintenance of oral hygiene is important

3. BELL'S PALSY

It is also called facial paralysis or seventh nerve paralysis

Clinical Features
- Inability to raise eyebrow
- Inability to close eyelid on affected side
- Flattening of nasolabial fold
- Accumulation of food inside the cheek (affected side)
- Drooping of corner of mouth [5]
- Pain over the post-auricular area(behind the ear-mastoid foramen)
- Drippling of saliva

Treatment

a) Medicinal treatment:
b) Acyclovir 400mg 5 times + Prednisolone 40 - 60mg daily for a week [5]
c) Transcutaneous electrical nerve stimulation therapy
d) Supportive therapy for eye: Eye patch, artificial tear substitute

Non drug Therapies

Physiotherapy, electrotherapy and thermotherapy [6]

e) Surgical correction

Oral Health Considerations
- Dental treatment will be difficult [drooping of corner, drooling of saliva etc]
- Oral hygiene maintanence is necessary
- Pt experiences difficulty in speech and mastication

4. MYASTHENIA GRAVIS

It is a long-term neuromuscular disease that leads to varying degrees of skeletal muscle weakness. The most commonly affected muscles are those of the eyes, face, and the patient may report of difficulty in swallowing.

Clinical Features
- The very first noticeable sign may be weakness of eye muscle, deglutition and improper phonetics.
- The functioning of muscles controlling eye and eyelid movements may be diminished
- Patient reports changes in mastication, swallowing and speech
- Smoothing out of forehead
- Drooping of eye brow
- Diminished facial expression is a common sign
- Few reports states that muscles that control breathing may also be affected

Treatment
- Acetylcholinestrase drugs-Neostigmine, pyridostigmine bromide Inc Acetylecholine availability & receptor binding [7] symptomatic relief
- IV immunoglobulins – reduce circulating antibodies [8]
- Corticosteroid – reduce autoantibody production

Oral Health Considerations
- Pt may have difficulty in with prolonged mouth opening and deglutition
- Aspiration risks are highUse rubber dam Avoid bilateral mandibular nerve blocks
- Drugs affecting neuromuscular junction should be avoided such as narcotics, tranquilizers, barbiturates

- Antibiotics affecting neuromuscular junction such as tetracyclin, streptomycin, sulphonamides, clindamycin should be avoided

5. PARKINSONISM

It is a neurodegenerative disorder characterized by rigidity, tremors, and impaired postural reflexes.

Clinical Features

- Mostly seen in people above 50 years
- Nearly 50% of patients may have dementia, depression, anxiety and irritability
- There are certain reports mentioning that few may show signs related to constipation, urinary urgency and abnormal sweating
- *Four cardinal signs* of this disorder are as follows
- Tremors, Rigidity/Stiffness, Bradykinesia, Postural instability/ Impaired balance and coordination

Treatment

- *Antiparkinsonism drugs levodopa+ carbidopa (gold standard)* [9]
- Anticholinergic drugs [scopalamine]– reduce tremors
- Exercise- physical conditioning, gait, balance, leg strength and walking speed

Oral Health Considerations

- Patient may experience increased salivation and drooling which render dental treatment difficult
- Angular chelitis is reported in few cases and represented as inflammatory itchy lesion over the corners of mouth
- Use of certain anticholinergics can lead to xerostomia which can result in damage to teeth aggrevating carious lesions
- Patient may experience difficulty during denture placement
- Occurrence of ulcerative lesion and certain bacterial & fungal infections
- Xerostomia can be controlled with the use of certain salivary substitutes & topical fluoride application
- Pt lose facial expressions in long term
- Slow phonetics
- Tremors of head, lips and tongue is a common sign which require an enameloplasty or placement of mouth guard appliances [10]
- It is better to align the dental chair at 45 degree angle to relive muscle ridigity, if any, and breathing difficulty problems.

CONCLUSION

Functional state of oral soft tissues and hard tissues is necessary to maintain a balanced oral activity. Various myopathic and neurogenic diseases often show common symptoms of weakness and atrophy of muscular system. If the orofacial muscular activity is abnormal, it can result in various dental problems which need to be addressed. Moreover the dentition may be affected due to the degenerative and inflammatory changes in muscles. Thus it is important to the clinical aspects and oral health issues related to these disorders and mange accordingly.

Conflict of Interest: The author reports no conflicts of interest.

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