LECTURE 5

Myofascial pain dysfunction syndrome (MPDS or MPS)

In the past MPDS was attributed to the inflammation of fibrous tissues around the ligaments, tendons, muscles and periosteum of the stomatognathic system.

However, recently this syndrome is defined as “dysfunction of the masticatory and associated muscles characterized by local pain and muscle stiffness” and is one of the most common causes of chronic musculoskeletal pain, however, not resulting in destructive changes in TMJ

It has always been an enigma having a big questional mark if it is an actually existed in reality or it is just a myth created by the specialists

Epidemiology

Research studies suggested that it is more common among females than males, ratio being 3:1. and in young unmarried females (married to unmarried ratio 1:2). It occurs commonly between 15-35 years of age.

Characteristic features

psychological disorder which involves the masticatory muscles results in pain, limitation in jaw movement, clicking sounds, jaw deviation and sensitivity in touching one or more masticatory muscles or their tendons. It is thought to be treated just by treating the underlying aetiology and this is considered as the currently most widely accepted treatment strategy.

The pain of MPDS is usually associated with unilateral pain and sometimes bilateral however, not always symmetrical. The quality or character of the pain reported by the patient most often will fall into three gross categories:

- Category I: A dull-aching pain,
- Category II: A sharp-shooting pain (burning)
- Category III: A tight-drawing sensation

Clinical features of MPDS
• TMJ sounds • Impaired or irregular mandibular movement • Limitation in mouth opening • Preauricular pain • Facial pain • Headaches • Jaw tenderness on function

Aetiology

There are multiple etiological factors for MPDS.

According to the psychophysiological theory:

- Muscle spasm is a main factor for myofascial pain dysfunction syndrome.

- Emotional factors are the primary etiological factors in stimulating chronic oral habits that produce muscle fatigue.
- Some complain of the pain immediately following a long dental appointment or the extraction of mandibular third molars.

These factors may results in the Activation of muscle nociceptors (pain receptors) by:
presynaptic, synaptic and postsynaptic mechanisms of abnormal depolarization (i.e. excessive release of acetylcholine (Ach), defects of acetylcholinesterase and upregulation of nicotine Ach-receptor activity, respectively) have been proposed to be the possible etiological mechanisms.

This multifactorial aetiology is interrelated as psychologic factors leads to an overall increase in masticatory muscle activity, while other factors such as occlusal and anatomic lead to selective increase in muscle activity

Etiology & Pathophysiology of MPDS
Etiology: • Occlusal disturbances • Intracapsular disorders • Emotional turmoil • Direct or indirect trauma • Spine pathology • Psychogenic influences like stress and strain • Habits like bruxism **Pathophysiology:** • Injury to muscle fiber type I • Metabolic distress at the motor end plates • Activation of muscle nociceptors • Transmission of pain to the CNS.

Simons hypothesis for myofascial trigger points

- Abnormal release of acetylcholine which causes increased muscle fibre tension, seen as the taut (stretched or hard) band found in a myofascial trigger point.
- This taut band constricts the blood flow that leads to local hypoxia.
- The reduced oxygen disrupts mitochondrial energy metabolism thereby reducing ATP and leading to tissue distress
- Release of sensitizing substances.
- The activation of nociceptors (pain receptors) causes pain and also lead to autonomic modulation which potentiates the abnormal acetylcholine release

Trigger zones and Tender spots

Trigger zones or points are small tender areas, which causes pain to the distant region, called the Referred Pain Zone. They are activated by pressure, movement, change of barometric pressure and tension (physical or emotional). Trigger points differ from “Tender spots” in the sense that the pain of Tender spots is localized spots while trigger point pain refers to a distant area. However, the treatment of trigger points and Tender spots are exactly the same.

Diagnostic Criteria

Laskin has proposed 4 main cardinal signs and negative characteristics for MPDS.

1) Four cardinal signs
- Unilateral pain
- Muscle tenderness
- Clicking or propping noise in the TMJ
- Limitation of jaw movement

2) Negative characteristics
- No radiographic evidence
- No tenderness in TMJ area on palpation via the external auditory meatus

Differential Diagnosis

• **Cluster headache**: a series of relatively short but extremely painful headache every day for weeks or months at a time.

• Migraine headache: is a result of specific changes within the brain. It causes severe head pain that is often accompanied by sensitivity to light, sound, or smells.

Post herpetic neuralgia: is a nerve pain which occurs due to damage to a peripheral nerve caused by the reactivation of the varicella zoster virus (herpes zoster, also known as shingles).

• Temporal cell arteritis: Giant-cell arteritis (GCA), also called temporal arteritis, is an inflammatory disease of blood vessels.

• Trigeminal neuralgia: is a chronic pain condition that affects the trigeminal nerve, which responsible about innervation of orofacial region.

• Middle ear infection: acute otitis media is most often a bacterial or viral infection that affects the middle ear, the air-filled space behind the eardrum that contains the tiny vibrating bones of the ear.

Management

Non-Surgical Management

a) Diet: Elimination of hard and chewy food helps to reduce loading forces on the joints and to rest hypertonic jaw muscles.

b) Rest: patient`s reassurance and education to be made aware of the relationship between stress and muscle tension. Resting the jaw is possible by making the patient aware of their unconscious postural, swallowing, clenching or grinding habits.

c) Pharmacological therapy

• **Analgesic drugs**: Opioid analgesics depresses CNS, just relieve pain. Whereas, non-opioid analgesic relief pain without depressing CNS. Examples- morphine, pethidine, codeine, salicylates and paracetamol.

• **Anti-inflammatory agents**: Commonly used are salicylates (aspirin), propionic acid (ibuprofen), acetic acid (indomethacin), fenamic acid, oxicam, aryl-acetic acid derivatives (diclofenac sodium).

• **Anxiolytics agents**: Benzodiazepines such as alprazolam, **diazepam**, lorazepam and oxazepam are commonly used to alter the patient's perception of reaction to the supportive therapy.

• **Muscle relaxants**: Commonly used are carisoprodol, chlorzoxazone, **meprobamate**, methocarbamol and cyclobenzaprine.

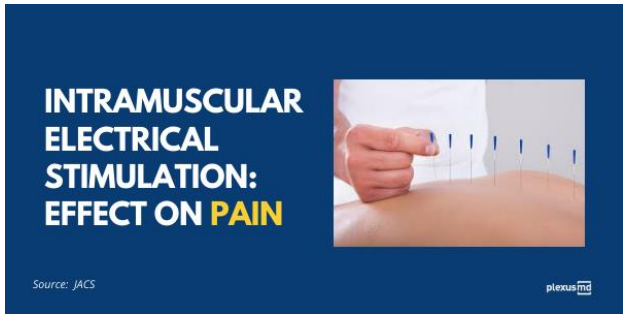
• A**nticonvulsants**: Gabapentin, Pregabalin

• **Antidepressants:** Tricyclic antidepressants, Sumatriptan, Duloxetine

d) Other Methods

- Transcutaneous Electric Nerve Stimulation (TENS)

- Electrical Twitch Obtaining Intramuscular Stimulation (ETOIMS)



- Laser Therapy

- Magnetic Stimulation (MS)

• Manual therapy:

Manual therapy is a commonly used treatment for MPS as it has been considered as one of the most effective techniques including

- deep-pressure massage,
- stretch therapy with spray (where a taut band is stretched immediately after cold spray),
- superficial heat and myofascial release

Surgical Management

- Condylotomy: is an osteotomy (a controlled fracture) performed through the condylar neck/vertical mandibular ramus.

- High Condylectomy
- Menisectomy: is the surgical removal of all or part of a torn meniscus

- Myotomy: describes a surgical procedure in which muscle of mastication is trimmed.

- Arthroscopy: is a surgical procedure in which orthopaedic surgeons use to visualize, diagnose, irrigate inside the joint.
- Botulinum toxin A (BtA) injections

Thank you