Review article:

Scope of physiotherapy in oral medicine

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Abstract:

Physiotherapy has been used to cure diseases of joints and muscles since ancient times. It has also cured various diseases without inflicting mental trauma and the pain of undergoing surgery. This novel way of medicine has been brought into practice in dentistry as an adjuvant therapy. Physiotherapy is recognized as essential for the prevention or treatment of temporomandibular joint (TMJ) hypomobility or ankylosis. Therapeutic motion nourishes the joint without activating painful muscles. People with trouble of speaking clearly, swallowing problems, or muscle weakness of the mouth may benefit by facial strengthening exercises. Oral-motor exercises are useful in the treatment of phonological/ articulator disorders. Several physical therapies like massage and facial exercises are recommended to patients of Bells palsy. It is also helpful in treating conditions like trismus, oral submucous fibrosis, Down's syndrome and even oral cancer. It is relatively simple, and non invasive, has a low cost and allows easy self management by patient. This adjunctive therapeutic modality is one of the major parts of a comprehensive management program of patients with orofacial disorders. This article reviews the importance of physiotherapy as an adjunct therapy in treatment of patients with orofacial disorders in the field of oral medicine.

Keywords: Physiotherapy, Physical Therapy, Heat Therapy, Facial Excercises.

INTRODUCTION:

Physical therapy (also known as physiotherapy) is a health profession concerned with the assessment, diagnosis, and treatment of disease and disability through physical means.[1]

The concept and benefits of physiotherapy have been a foreign idea to quite a lot of people in the past and even up to the present. Physiotherapy goes way back to the times of Hippocrates, deemed as the great Father of medicine, who acknowledged that movements of body part has to be encouraged to promote good blood circulation necessary for a patient's recovery. The recognition of physiotherapy and its benefits was established during the polio outbreak in the 1940's and 1950's when it became main therapy in averting the disabling effects of this disease[1].

Physiotherapy is a preventive and remedial procedure that is very often used as a supplement with oral medicines. Besides, physiotherapy helps in optimal functioning of the body. It is therefore specially recommended for physically challenged, sportsp-ersons, persons with degenerative diseases & those affected with arthritis, spondylosis, neurological dysfunction & so on.

Physiotherapy or physical therapy is basically a form of treatment using physical exercises. Physiotherapy has been brought in to practice in dentistry as an adjuvant therapy. It can be used to treat various Oro-

facial disorders like oral sub mucous fibrosis, facial palsy, TMJ disorder, myofacial pain dysfunction syndrome, neuralgic pain, trismus, patients with trouble of speaking clearly, swallowing problem or muscle weakness[2,3].

PHYSIOTHERAPY EXERCISES INCLUDES- [2,3] **B.**

Physical Therapy	Facial Strengthening exercise, Massage Therapy, Mouth Opening Exercise for trismus, Tongue exercise and Yoga.
Electro Therapy	Electric current, Therapeutic ultrasound, Diathermy, Acupuncture, Laser therapy, Ultraviolet radiation, Infra radiation.
Thermal Therapy	Hot packs, paraffin wax, ice packs, ice massage, cryotherapy and cold spray.

PHYSICAL THERAPY

A. FACIAL STRENGTHENING EXERCISE

1. TONGUE-ON-ROOF

This can reduce TMJ stress and restore proper movement patterns. Ask the patient to place tongue on the roof of mouth, back away from the teeth. Hold the tongue at the roof of the mouth as you open the jaw. Keep the tongue at the roof of the mouth as he/she opens and closes the jaw ten times. Patient may need to do this in front of a mirror to make sure his/her jaw moves straight. Advice to do this exercise often all day, especially when one find himself/herself clenching teeth.[4]**(Figure1)**

2. RESISTED JAW OPENING[4]

This is the same as the tongue-on-roof exercise, except with slight resistance to opening applied under chin. Place the tongue on the roof of your mouth.

Indication:-

People with trouble of speaking clearly, swallowing problems or muscle weakness of the mouth may benefit from these exercises.[2]

Advantages:-

Helpful in increasing the strength and range of motion for the jaws, cheeks, lips and tongue.[2]It decreases muscle spasm, increases flexibility.**(Figure 2)**

Disadvantages:-

Facial exercises take longer time; can induce wrinkles if done improperly.[2]

B. MASSAGE THERAPY

Massage therapy is done by massaging and gently stretching the skin from the corner of the mouth towards the ear and then down to the jaw in a circular pattern.[2]

The same circular pattern is again carried out on the chin and forehead,by brushing forehead with finger,make up brush and ice cube or by the back of an electric toothbrush in an upward direction towards the hairline several times along with gently tapping the skin with finger tips.[2] **(Figure 3)**

Indications:– for chronic neck pain patients, chronic muscular pain, facial palsy, cancer patients.[2]

Contraindications:-

Massage should not be done in any area of body with blood clots, fractures, open wounds, infections, and weakened bones. Vigorous massage therapy should be avoided in patients with bleeding disorders, low platelet count.[2]

Advantages:-

Massage is the manual manipulation and kneading of soft tissues, particularly of muscles which improve blood circulation, relaxation of tense muscles, improve range of motion and increased endorphin levels, all of which may benefit people with chronic pain.[2]Massage therapy often considered as part of complementary and alternative therapy.[5]

Disadvantages:-

Massage therapy may cause temporary pain, swelling, discomfort.[2]

MOUTH OPENING EXERCISES FOR TRISMUS

Mouth Opening Exercises with wooden ice-cream stick,Mouth gag and spring loaded device.[2]A stack of wooden ice cream sticks can be kept between each

side posterior teeth followed by gradual increase in number of sticks. Spring loaded Device that is used for post operative trismus, which provides an active opening force from the mandibular splint, distributed against a splint on the maxillary teeth and hard palate. Because the force is continuous and broadly distributed, patients are able to exercise with minimal discomfort and they have been able to maintain their initial postoperative mobility.[6] **(Figure 4)**

Indications:- Oral submucous fibrosis, post operative trismus, trismus in irradiated patients with head and neck cancer and temporomandibular joint disorders.[2,6]

Advantages-Patient can be saved from postsurgical fibrosis, the most common disadvantage following surgery.[2]

Disadvantages:–Time consuming and requires more patient compliance.[2]

C. TONGUE EXERCISES

1. The exercises for tongue include straight tongue stretch by opening the mouth and stretching it out as far as possible.
2. Side tongue stretch by stretching the tongue towards right and left and touching the corner of the mouth.
3. Up and down tongue stretch by stretching the tongue upwards towards the nose and downwards towards the chin.
4. Tongue sweep by sliding the tongue along the outside of the teeth and gums making circles in the mouth
5. Licking lips by the tip of the tongue.
6. Tongue in cheek push by pushing the tongue against the inside of the cheek and moving it up and down.
7. Tongue blade exercise is done by sticking the tongue out straight pressing the tongue tip out against a flat wooden stick or tongue blade 2 or 3 times and pulling the stick against the one side of the tongue and pushing the side of the tongue against the stick.

Indication: Patients difficulty in speech problem & swallowing, Bell's palsy, glossopharyngeal neuralgia and oral submucous fibrosis.[2]**(Figure 5)**

YOGA

Yoga is a traditional Indian culture and way of life which is purported to give the practitioner a "Healthy body and a sound mind" and is believed to alleviate stress and include relaxation, warm ups and stretching, postures, affirmation and visualization.[2]

Indications-

It can be advised as adjuvant in treatment of TMJ disorders like subluxation, dislocation , disc derangement , myofacial pain dysfunction syndrome.[2]

Advantages- No side effects if done properly.[2]

Disadvantages- It takes long time in taking effects.[2]

ELECTROTHERAPY METHOD

I. ELECTRICAL CURRENT

TENS is thought to operate by facilitating interruption of the neural transmission of pain. Operating at higher current amplitude than microcurrent, sensory-level (or ''conventional'') TENS is thought to attenuate the perception of pain via stimulation of large-diameter afferent peripheral nerve fibers and subsequent interruption of pain transmission at the dorsal horn due to the gate control mechanism.[3]**(Figure 6)**

Indications: - control of chronic or acute pain, post surgical pain, post traumatic acute pain, acute pain in dental procedure, post herpetic neuralgia, triegeminal neuralgia, peripheral nerve injury and facial pain.[3]

Contraindications: - Patients who have-pacemakers, pregnancy, cerebrovascular disease. [3]

Advantages: - Non medicinal non invasive therapy.[3]

Disadvantages- TENS therapy could produce burns on skin, caffeine & narcotics reduce its effectiveness, prolonged use may result in muscle spasm.

Unlike physical agents, whose primary site of action in pain control is the tissue level, TENS is thought to operate by facilitating interruption of the neural transmission of pain.[3]

II. THERAPEUTIC ULTRASOUND

Ultrasonic energy causes soft tissue molecules to vibrate from exposure to the compression and rarefaction caused by the acoustic wave. Increased molecular motion leads to microfriction between molecules, and frictional heat is generated, thus increasing tissue temperature.[3] **(Figure 7)**

Indication:- It is indicated for treating scar tissues, joint contractures , tissue adhesions and maladaptive shortening of connective tissue, in treating soft tissue lesions of various origin , muscle spasms, tendonitis, myofacial trigger points , complex regional pain syndrome, Osteoradionecrosis, burns, ulcer, wound, lichen planus, scleroderma. [3]

Contraindications-Should not be used over pregnant abdomens, plastic implants, haemorrhageregion , malignant lesions, ischaemic lesions. [3]

Advantages –

Therapeutic ultrasound has thermal & non-thermal effect.Thermal effect relieves pain, muscle spasm, increase tissue extensibility, blood flow, and reduces joint stiffness & neuromuscular spasm. Non-thermal effects for cavitation, for stimulation of fibroblastic activity, increase protein synthesis, blood flow & tissue regeneration**.**[3]

Disadvantages-

- It'stherapeutic uses are almost exclusively at tissue level which makes it a potential tool for nociceptive pain but of limited or no use for central pain or chronic pain exacerbated by neuroplasticremodelling.
- Presents risk of periosteal burning/ pain as it causes differential heating at tissue interfaces due to difference in the sonic impedance of different tissues.[3]

III. DIATHERMY

Diathermy is the use of softwave(wavelength 3-30 m, frequency 10-100 MHz) or microwave (wavelength 0.001-1 m, frequency 300 MHz to 300GHz) electromagnetic radiation to produce heat within body tissue through conversion.[3] **(Figure 8)**

Indications-

Clinical uses of diathermy include augmentation of healing, decreased joint stiffness and increased joint range of motion, pain control via edema reduction and enhanced healing of soft tissue wounds (e.g., burns, pressure ulcers, and surgical wounds) & peripheral nerve lesions.[3]

Contraindications-

Should not be used over pregnant abdomens, plastic implants, haemorrhage region, malignant lesions, ischaemic lesions.[3]

Advantages –

- It has placebo effects.
- Adjunct to the management of pain and inflammation.
- Heats deeper tissue level than ultrasound.
- It can heat larger areas than ultrasound.
- No risk of periosteal burning.[3]

Disadvantages-

-it is of limited or no use for central pain.

It produces shearing, standing waves at superficial tissue level. [3]

IV. ACUPUNCTURE

The analgesic effects of acupuncture is due to increased levels of mediators, including endorphin, encephalin and serotonin, in the plasma and brain tissue.[7]

Indication:- For trigeminal neuralgia patient, refractory to pharmacological treatment, facial nerve pain.[5,8]**(Figure 9)**

Advantages:-

Acupuncture-absolutely painless process, can stimulate internal organs, and muscles without need of an incision.[7]

Disadvantages:-

- Medical explanations of its mechanism are not as clear as modern medicine.
- With long term treatment patients don't find it as effective as it initially was.[7]

V. LASER THERAPY

Special properties of laser light allow the potential for direct delivery of electromagnetic light energy to tissue depths slightly below the dermis and possible indirect physiologic effects at deeper levels. The ability of laser light to penetrate is a function of tissue type and the laser's wavelength and resistance to scatter. The most commonly used wavelengths for clinical application of laser light range from 600 to 1300 nm, allowing a direct tissue penetration depth of 1 to 4 mm.[2,3]**(Figure 10)**

Indications –

Laser therapy can be used in treating swelling & edema in acute phase injury, and accelerating, healing of surgical wound. It is also significant in treatment of ulcer, burns, scleroderma, lichen planus, Facial palsy, headache, trigeminal neuralgia, post herpetic neuralgia & peripheral nerve injury.[3]

Contraindication-

Exposure of eye, photosensitive areas of skin, any area within 4 to 6 months of radiotherapy, neoplastic areas, over the heart, vagus nerve.[3]

Advantages-

- Non invasive method.
- No scattered radiation is produced.[3]

Disadvantages-

It imparts only temporary reduction of pain.[3]

G. THERMAL MODALITIES

HEAT & COLD APPLICATION

Superficial heat is applied in the form of hot packs, paraffin, and hydrotherapy. superficial cold is applied in form of cold spray or cold pack.[3]**(Figure 11)**

Indications:

Cold therapy: It relieves postoperative pain, prevents swelling in injured tissues, diminish muscle contraction.[3]

Heat therapy: Myofascial pain dysfunction syndrome.[3]

Contraindications

Cold therapy : in patients with Raynaud's disease, peripheral vascular disease, rheumatoid arthritis, sickle cell anemia.

Heat therapy: in patients with recent hemorrhage, bleeding, localized infection, patients with heart, lung, kidney disease, diabetes, multiple sclerosis, deep heat should be avoided over areas of metal implants.[3]

Advantages

Cold therapy- All nerve fibers are affected by cold, increases the refractory period of nerveand has counterirritant effects.

Therapeutic application of superficial mild heat to increase circulation, enhance healing, increase soft tissue extensibility, and control pain.[3]

Disadvantages

Cold therapy- freezing of tissues on prolonged exposure, analgesic effect may allow patient to exceed his desired activity level can cause tissue damage, can cause nerve damage.

Heat therapy– Burns may result if applied for long, potential for tissue damage.[3]

CONCLUSION

The focus of the physiotherapy intervention is to deal with the physical and functional sequel of the disease and/or its treatment. Various forms of physiotherapies can be given to treat chronic orofacial pains alone or with medicinal treatment. It should be considered as an adjuvant rather than a replacement of medicinal treatment.

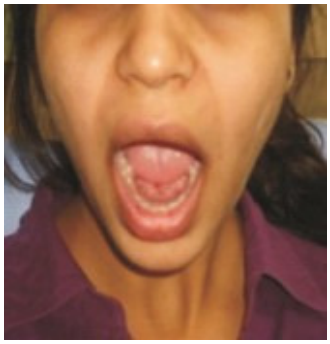

Figure 4 – Mouth opening exercises with wooden stick, mouth gag and mouth opening device.

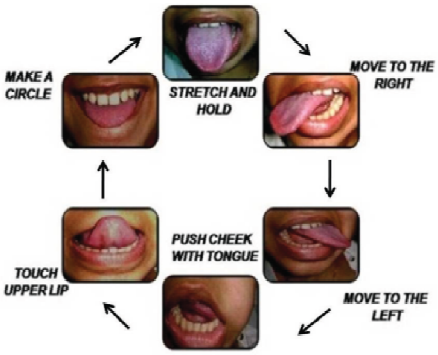

Figure 1– Different type of facialstrengthening exercises

Figure 2 – Different type of facial strengthening exercises

Figure 5 – Tongue exercises

Figure 6 – TENS device and its uses

Figure 3– Massage therapy

Figure 7 –Therapeutic ultrasound

Figure 8 – Diathermy device

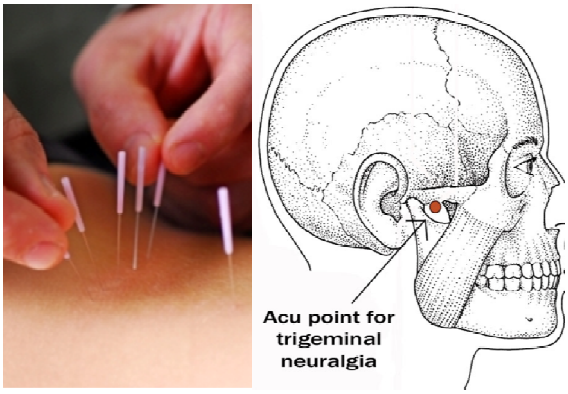

Figure 9 – Acupuncture and acupuncture point for trigeminal neuralgia

Figure 10 – Laser therapy **Figure 11** – Heat & cold application

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