EFFECTIVENESS OF REHABILITATION ON HEAD AND NECK CANCER PATIENT: A LITERATURE REVIEW

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Abstract

Like other cancer, head and neck cancer is a major health problem globally as well as in India. Head and neck cancer result in decrease in ROM of jaw , neck and shoulder. Weakness of jaw muscle, neck muscle present. Lymph edema present in neck area. There is negative impact on the quality of life like other cancers. Rehabilitation is very effective in head and neck cancer patient.

Keywords: Head and neck cancer, Rehabilitation

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INTRODUCTION

Head and neck squalors cell carcinomas (HNSCCs) extend from the mucosal epithelium in the oral cavity, pharynx and larynx and are the most common malignancies that begin in the head and neck. (1)

Cancers are a major worldwide public health problem. It is mostly a disease of the developed world with an incidence of 350-500/100 000. In contrast, the occurrence of cancers in India is much lower estimated at a 100/100000. (2)

Head and neck cancers are one of the most frequent cancers in India and globally it is the sixth most common cancer. Smoking tobacco, consuming other tobacco-related products and alcohol are the main causative agent for head and neck cancers. (3)

The immense majority (more than 90%) are squalors cell carcinomas, and the disease typically appears in the or pharynx, oral cavity, hypo pharynx,

Or larynx. (4)

Restricted mouth opening negatively affects patients' health and quality of life. Eating, oral hygiene, talking, and other social interactions are compromised to a range of degrees. Additionally, oral access for dental

care and oncologic examination may become restricted to different extents.(5)

Trismus is one of the common aftereffects of HNC treatment, along with dysphagia, xerostomia, mucositis and radiation dermatitis (6)

The basis of treatment for locoregionally advanced head and neck squamous cell carcinoma (HNSCC) is either surgery followed by adjuvant radiation therapy (aRT) or definitive concurrent chemoradiation (CRT) reserving surgery as salvage therapy, suggested as the organ-preservation approach (7)

Symptoms also arise as aftereffects of opioids, chemotherapy, and radiotherapy. All symptoms have an effect on the quality of life (QOL) of cancer patients. (8)

REVIEW OF LITERATURE

The mainly used instruments for quality of life examination of patients with head and neck cancer, according to the International Conference on Quality of Life held in Virginia, USA, in October 2002, are the Functional Assessment of Cancer Therapy Quality of Life Measurement System (FACT-H&N), the University of Washington Quality of Life Questionnaire (UW-QOL) and the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Core 30- EORTC QLQ-C30 along with the European Organization for Research and Treatment of Cancer Quality of life-Head and Neck Cancer Module (EORTC QLQ-H&N35) (9)

Follow-up (FU) is a standard method in patients after oncological surgery. The main aim of FU schemes is to identify possible reappearance in an early stage, thereby increasing the percentage of cure. A further, FU task is to assess the efficacy of treatment, early diagnosis, treatment of complications, make certain permanent contact with an oncology team familiar with the history of the patient's disease and to offer psychological care.(10)

Head and neck lymphedema that outcome from therapies used in the treatment of head and neck cancer is considered a chronic and complex difficulty that manifests as a feeling of heaviness or tightness and permanent distress in the affected area; visible swallowing may or may not exist (11)

Physical therapists, who are accountable for examining and managing the side effects resulting from cancer and its treatment, have become an crucial part of the continuum of cancer care (12)

Strength-based exercises and/or range of movement exercises aimed at the swallowing musculature may prevent muscle atrophy and reduce or delay the impact of radiation-induced fibrosis (13)

Sl. no.	Total Pt	Participants	Intervention	Outcomes studied	Conclusion
1.	Not specified	Head and neck cancer patients	General stretching and range of motion exercises; trismus and swallowing-specific exercises Mendelsohn's maneuver	Questionnaires; g-tube dependence; mouth opening; MBS reports	Show positive or N/A effect
2.	24 (12-MFR and 12-MET)	Operated Head and Neck Cancer Patients	1. Myofascial release to lateral aspect of neck (involved side) 2. Muscle Energy Technique to cervical side flexors of involved side	1. Neck Disability Index 2. Pressure pain threshold (pressure algometer) 3. Cervical Range of Motion 4. FACT H&N	Statistically significant improvement seen in pain, neck disability scores and cervical range of motion in both groups. QOL statistically insignificant in both groups
3.	1	Head and Neck	1. Myofascial release upper part of the	1. NPRS	Reduction in pain,

		Cancer patient	trapezius muscle, semispinalis and splenius capitis, base of the skull, releasing the scar tissue, sternocleidomastoid muscle, infra- and suprahyoid muscles 2. Post-isometric relaxation the upper part of the trapezius muscle, sternocleidomastoid muscle, suboccipital muscles	2. Cervical ROM 3. Edmonton Symptom Assessment Scale (ESAS)	increase in range of motion and general improvement was observed
4.	12	Head and Neck cancer patients	Mobilisation exercises of cervical and thoracic spine	1. EORTC QLQ C-30 2. QLQ-HN35	Statistically significant changes were seen in QLQ C-30 in physical, social, cognition function andQLQ-HN35 showed significant improvement in sexuality
5.	12 IG/11 CG	Head and neck patient	Laser therapy Application on major salivary glands, parotid, submandibular and sublingual glands VS Sham laser therapy	OHIP-14	LLLT ineffective for SFR increase, xerostomia reduction in radiotherapy-affected gland
6.	116 IG/54 CG	Head and neck patient receiving radiatherapy	E-stim device: Electrical Stimulation to stimulate the suprahyoid muscles + swallow exercises.5-minute warmup stretching protocol followed by swallowing 60 times in synchrony with the stimulation VS Sham device+ swallow exercises. 5-minute warmup stretching Protocol followed by swallowing 60 times in synchrony with the stimulation	HNCI	Swallow exercises and NMES have limited effectiveness. Current behavioral therapies are also of limited.
7	15	Operated Head and Neck Cancer Patients	1. 1.Maitland mobilisation to cervical spine 2. Muscle Energy Technique for cervical rotators and side flexors 3. Cyriax soft tissue release to sub cranial region transverse friction technique was applied to maximum soft tissue restriction	1. NPRS 2. FACT H&N 3. Cervical ROM 4. Neck disability Index	Statistically significant improvement in pain, Range of motion of Cervical Spine, Quality of life and scores of Neck disability Index were observed
8	5	Head and neck cancer Patients undergoing Radiation therapy	1. Upper cervical mobilization techniques, and atlantooccipital and atlantoaxial mobilization for craniocervical flexion and extension 2. Upper Thoracic mobilization techniques 3. Manual stretching techniques for muscles of mastication, medial and lateral pterygoids, suboccipitals including splenius capitus and cervicus, sternocleidomastoid, upper trapezius, levator scapulae, pectoralis minor	1. Wong Baker Pain Faces Scale 2. Cervical ROM	Improvement in pain and cervical range of motion were observed post treatment
9	Group A: 13 Group B: 10 Group C: 14	Head and neck radiotherapy patient	ALTENS Group A: Sp6, St36, LI4 (active electrodes) and CV24 (indifferent electrode) VS ALTENS Group B: Sp6, St36, P6 (active electrodes) and CV24 (indifferent electrode) Group C: Sp6, St5 and 6, P6 (active electrodes) and CV24 (indifferent electrode)	Head and Neck Radiotherapy Questionnaire	Codetron treatment showed positive effects on increasing saliva production and alleviating symptoms in patients with radiation-induced xerostomia
10	1	Operated Head and Neck Cancer patient	1. Soft tissue mobilization was applied to the left anterolateral structures of the neck and postero-lateral structures of the left subcranial region 2. Manual muscle lengthening was performed using contract-relax to the left scalenes, sternocleidomastoid, upper trapezius, and posterior subcranial muscles 3. Maitland Grade III and IV mobilization was applied through the left posterior articular pillars of the mid and lower	1.NPRS 2. Neck Disability Index 3. Cervical ROM	Reduction in pain, increase range of motion, and normalize arthrokinematic motion of the cervical spine was observed post treatment

			cervical vertebrae in order to increase right rotation. 3 sets of 30 s intervals was performed 4. Mobilisation was given to right cervical spine to increase right lateral flexion 5. Muscle energy technique was given for side flexors and contralateral rotators. (3–5 repetition		

The post treatment period is normally characterized by slow recovery and improvement; though, only global health status/QoL seems to reach Pre treatment levels within 1 year after treatment completion. Therefore, the following year(s) of HNC survivorship is characterized by constant treatment-related side effects accompanied by deteriorated functional status (14)

Rehabilitation interventions for HNC are evidently safe, feasible, cost-effective and related with improvements in quality of life, general conditioning, swallowing, muscle function, insomnia, pain, weakness, loss of appetite, shortness of breath, tube-feeding dependency, hospital readmissions, depression and distress (15)

Rehabilitation that prevents and/or alleviates the loss of function and increases the patients' quality of life hence seems essential. Several specific swallowing exercises have the likely to improve prognosis for oral intake (e.g., jaw exercises, swallowing exercises and maneuvres) (16)

Clinical training interventions such as rehabilitation centers and physiotherapy sessions are commonly available, but their duration is typically limited to a brief period of time, typically a few weeks. (17)

As a result of undergoing radiotherapy, patients may experience a degenerative process that leads to decreased saliva production (hyposalivation) and dry mouth (xerostomia) (18)

Although there is limited evidence to support the use of electrical stimulation therapy (ESTIM) for the treatment of dysphagia in head and neck cancer (HNC) patients, the therapy remains widely used and popular. (19)

Studies have shown that acupuncture therapy is effective in treating xerostomia in patients and provides long-lasting results. (20)

Principles of neuromuscular plasticity from fields of physical rehabilitation, exercise science, and sports training and associated the research in these fields to muscles of mastication and swallowing. Importance of the details of an exercise regimen, as these apparently small features will have differing results to the neuromuscular system. For example, the number of repetitions of an exercise included in a set may vary depending on the goals of the exercise program. A program designed to improve strength and endurance of a muscle requires more repetitions per set (e.g., 8 to 12), while a program designed to improve strength and power of a muscle requires fewer repetitions per set (e.g., 6 to 8) (21)

As myofascial trigger point (MT) techniques are considered a potential solution for preventing or reducing fibrosis-related dysphagia in head and neck cancer patients, an increasing number of patients and healthcare providers are seeking this therapy in the hope of experiencing its therapeutic benefits.(22)

Studies have shown that manual lymphatic drainage (MLD), also known as manual lymphatic therapy (MLT), is effective in increasing the range of motion (ROM) and improving lymphatic circulation. (23)

Myofascial release (MFR) and muscles energy techniques (MET) have proved to be useful in pain management and so improving QOL (24)

There are active therapy procedures that have been designed to improve impaired swallow function after treatment for cancer of the head and neck.

Range of Motion Exercises

Range of motion exercises can be used for the lips, jaw, oral tongue, tongue base, larynx, and hyoid-related musculature. Though the optimal frequency and duration of ROM exercises is not yet determined, five to ten repetitions of each exercise for five to ten sessions per day are generally recommended.

Jaw ROM— Restricted mouth opening, often introduced as trismus, may result from surgical resection of the muscles of mastication, scarring after ablation of a segment of the mandible, or fibrosis of irradiated tissues. Current methods are used to increase mouth opening include unassisted jaw ROM exercises, finger-assisted stretching

exercises, stacked tongue depressors, and mechanical support with a device such as Therabite.

Tongue ROM Exercises—Scarring of the tongue after surgery may prevent adequate range of motion to clear the bolus from the oral cavity; reconstruction procedures that tie the tongue anteriorly will negatively impact tongue base retraction. Fibrosis after radiotherapy will also decrease the tongue's ability to move normally. Range of motion exercises may be used for the oral tongue and tongue base to progress movement.

Oral Tongue ROM Exercises—Tongue range of motion exercises for the oral tongue include extension, lateralization, elevation, and retraction

Bolus Manipulation Exercises—Bolus manipulation exercises are a type of ROM exercise planned to augment tongue movements essential for chewing, bolus formation, and bolus move. The exercises may be performed with a strip of gauze soaked in water or beverage, a supple licorice stick or similar candy, or a small lollipop on a stick.

Tongue Cupping: This exercise is to practice holding a bolus in the oral cavity. Instruct the patient to get a piece of soaked gauze (or licorice stick, lollipop, etc.) and place it on the middle of the tongue, holding on to the other end exterior the mouth. Hold the gauze against the roof of the mouth so that the tip of the tongue is sealed behind the alveolar ridge and the sides of the tongue are against the roof of the mouth close to the molars (or gums if the patient has no teeth). Hold the position 5 seconds then relax. Repeat 5-10 times.

Tongue Side to Side Movement: This exercise is to practice moving the bolus backward and forward onto the teeth or gums for chewing.

Tongue Posterior Movement: This exercise is to practice moving the bolus through the oral cavity.

Tongue Base ROM Exercises—Retraction of the tongue as far back as probable in the oral cavity will exercise the tongue base. Other exercises for tongue base range of motion include assume to gargle and assume to yawn.

Laryngeal ROM Exercises— Decreased laryngeal elevation is frequently reported in treated head and neck cancer patients, particularly in those who have been irradiated. It has been demonstrated that reduced laryngeal elevation is considerably interrelated with restrictions in oral intake and diet during the first year after cancer treatment

Falsetto Voice—A falsetto voice exercise may be functional in improving laryngeal range of motion for elevation. During falsetto voice production, the larynx elevates almost as much as it does during the swallow

Mendelsohn— Mendelsohn maneuver is a voluntary prolongation of laryngeal excursion at the midpoint of the swallow, intended to increase the extent and duration of laryngeal elevation and thus increase the duration of cricopharyngeal opening.

Shaker Exercise for Hyolaryngeal ROM— Another exercise that holds assure for patients with cricopharyngeal dysfunction is the Shaker Exercise. As the suprahyoid muscle group responsible for dislocation of the hyolaryngeal complex and opening of the UES appears responsive to external influences, a simple isometric/isokinetic head lift exercise aimed at these muscles developed and tested

Neuromuscular Electrical Stimulation—Surface neuromuscular electrical stimulation (NMES) has newly been suggested as a treatment choice for pharyngeal dysphagia. Surface electrical stimulation is applied through electrodes placed on the neck with the aim of promoting increased hyoid or laryngeal elevation

Laryngeal Closure Exercises—Patients who have received surgical intervention or radiation to the larynx may have difficulty in protecting the airway. Laryngeal closure exercises may be used to recover airway closure at the level of the true cords or higher at the vestibule.

Tongue Resistance or Strengthening Exercises

Oral tongue strength may be decreased in patients with cancer of the head and neck .

Resistance or strengthening exercises are used to build or sustain strength in the oral tongue with the rationale that stronger muscles will function better during the swallow. Strengthening exercises usually engage in pushing the target structure against some type of resistance and holding it for several seconds

Thermal/Tactile stimulation

Delayed triggering of the pharyngeal swallow has been observed in treated head and neck cancer patients. Thermal/tactile stimulation is considered to sensitize or stimulate the area of the oral cavity where the swallow reflex is thought to trigger. The procedure consists of applying cold pressure to the base of the anterior faucial arches

Intraoral Prosthestics

Intraoral prosthetics are developed by a maxillofacial prosthodontist with input from the surgeon and speech pathologist for patients who expected surgical resection in the oral cavity for head and neck tumors. Several varieties of intraoral prostheses may be form to compensate for the loss of oropharyngeal structures in postsurgical oral cancer patients.

Maxillary reshaping prostheses, also known as palatal drop or palatal lowering prostheses, are used to reshape and lower the palatal vault so that the remaining portion of the resected tongue can make contact with the palate for speech and swallowing (25)

Incorporating manual lymphatic drainage into the adjuvant treatment plan is crucial for patients undergoing cancer therapy. During this treatment, certain muscles, fascia layers, subcutaneous tissue, and skin may be damaged or surgically removed, leading to significant scarring. (26)

Increase in survival rates due to improvement in cancer care also authenticates the need for rehabilitation programs for head and neck cancer patient population (27)

CONCLUSION

The present study found evidence for rehabilitation for head and neck cancer patients. Various ROM exercise, strengthening exercise, NMES, tactile or thermal stimulation are part of rehabilitation but with precautions. Advance techniques like MFR, MET are also included in rehabilitation but with the care.

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