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RESEARCH ARTICLE

HOW TO BROACH A MUSCLE TENSION DYSPHONIA CASE

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ABSTRACT

Muscle Tension Dysphonia (MTD) is a condition where excessive muscular tension or muscle misuse is associated with phonation. It has multifactorial etiologies. It can be a primary or secondary Muscle Tension Dysphonia. While it can affect anyone, sufferers usually belong to a particular group. It has very serious impact on sufferer's personal, social & professional life. We are presenting here, our 1 year prospective study done in the department of Otorhinolaryngology, Silchar Medical College & Hospital from June 2012 to July 2013. Voice therapy was given to every patient whether primary or secondary muscle tension dysphonia & Pre therapy-versus-post therapy comparisons were made of self-ratings of Voice Handicap Index, Auditory-Perceptual Ratings, as well as, Visual - Perceptual Evaluations of laryngeal images. Outcome of voice therapy results in such patients were found to be very good. As the disease is multifactorial so treatment approach should be broad based involving multidisciplinary team

INTRODUCTION

Muscle Tension Dysphonia (MTD) is a condition where excessive muscular tension in laryngeal & paralaryngeal areas or muscle misuse is associated with phonation. Various synonyms have been used for this entity like hyperkinetic dysphonia, musculoskeletal tension dysphonia, hyperfunctional dysphonia, mechanical voice disorder, functional hypertensive dysphonia, muscle misuse dysphonia, laryngeal isometric dysphonia, laryngeal- tension fatigue syndrome[1]. It has multifactorial etiologies. It can be a primary or secondary Muscle Tension Dysphonia. Secondary MTD is due to compensatory behavior of phonation in diseases which affects either the aerodynamic configuration (like vocal fold paralysis), or the vibratory property of glottis (like vocal cord nodule). However when the MTD is present without the anatomic or neurologic factors then it is called as primary MTD. While it can affect anyone, sufferers usually belong to a particular group like teachers, singers & actors, frequent cell phone users and instructors etc. who are likely to speak louder, for long hours with inappropriate pitch, without following vocal hygiene. A detailed history & complete examination is necessary to diagnose MTD. It has very serious impact on sufferer's personal, social & professional life and significantly decreases the quality of life.

MATERIALS & METHODS

This study is a prospective study during the period of June 2012 to July 2013 carried out at Department Of ENT, at Silchar Medical College, Silchar, Assam.

Subjects

Eleven subjects with Muscle Tension Dysphonia were selected for the study after making a proper diagnosis on the basis of history, clinical & laryngoscopic examination. The patients were in the age group of 20-70 years.

Patients included in the study were

Primary MTD (8), Secondary MTD: Vocal Cord Nodule (3), Vocal Cord Polyp (2), Cut Throat injury (1)

***Patients excluded from the study were*:** patients who didn't come for follow up. All the excised tissues of secondary MTD cases were sent for histopathological examination.

Voice outcome measures

The voice was recorded before & after voice therapy & voice outcome was based on Auditory-Perceptual Ratings, Quality Of Life Measures and Visual-Perceptual Ratings.

1. ***Auditory-Perceptual Ratings***: Subjects were asked to read 'The Rainbow passage' (Operating Techniques In Laryngology) or to count 1 to 20 & voice was recorded. Perceptual ratings of voice quality were conducted with the 'GRBAS scale'[13]. The GRBAS scale is considered by many authors to be the most reliable auditory perceptual scale currently available for use as an outcome measure[2,3].
2. ***Quality Of Life Measures :-*** 'Voice Handicap Index' was used to assess the impact of the voice in terms of physical complaint and restriction in participation in daily activities & response to treatment[4,5,6,7,8].
3. ***Visual-Perceptual Ratings***: It was based on comparison of Transnasal flexible Videolaryngoscopy (TFL) done before & after the voice therapy.

RESULTS

Abbreviations: Vocal Cord Nodule (N), Vocal Polyp (P), Cut Throat injury(CT), Primary Muscle Tension Dysphonia (PMTD), Dysphonia Plica ventricular(PV)]

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VOICE THERAPY
Vocal Hygiene
Symptomatic Voice Therapy : Circumlaryngeal massage, Chewing exercises, Yawn sigh approach, Phonation on inhalation
Respiratory Retraining : Breath support, Confidential voice therapy
Physiologic Voice Therapy : Vocal function exercises, Accent method, Resonant voice Therapy
Psychogenic Voice Therapy

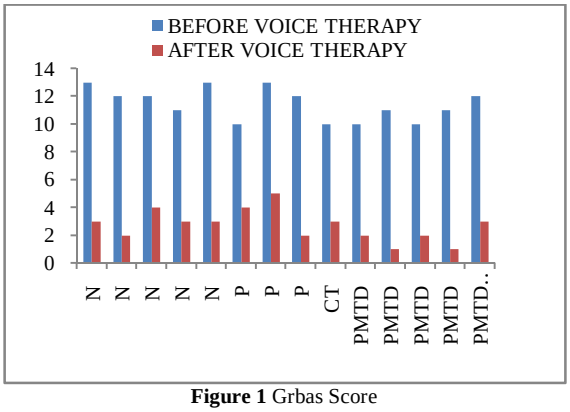

Figure 1 Grbas Score

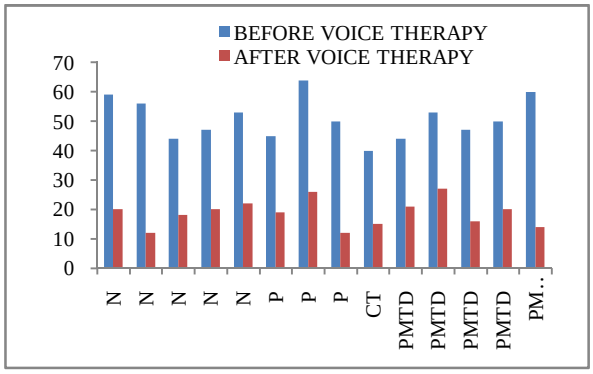

Figure 2 Voice Handicap Index

DISCUSSION

It is among the common voice disorders, with primary MTD accounting for approximately 10-40% of the caseload of a typical voice center (Roy, 2003). In our study, we made the diagnosis on the basis of history, clinical & videolaryngoscopic examination. We found tenderness over different sites in the neck which were related to their respective excessive muscle tension. We started voice therapy before the surgery, in cases of vocal cord nodule/polyp so that their habits of voice abuse & misuse & compensatory behavior don't have worse affect postoperatively. Patients were informed about their diagnosis, anatomy & physiology of normal vocal tract in order to minimize the anxiety & stress and also to develop their belief in the voice therapy so that drop out cases may be reduced. Vocal hygiene was instructed to every patient to eliminate the environmental & behavioral factors. Posture & mouth opening during phonation were corrected. Inappropriate muscle usage causing muscle tension at neck, floor of mouth or jaw were managed accordingly by massaging the muscle in tension, in the line of their muscle fibers. Treatment generally targets the increased hyolaryngeal elevation and laryngeal & perilaryngeal muscular tension. Circumlaryngeal massage was considered to treat extrinsic laryngeal muscle tension. Patients were considered for symptomatic, physiologic & psychogenic voice therapy in addition to respiratory retraining as & when required. In one of our cases i.e., Dysphonia Plica Ventricularis we considered psychotherapy because he was having anxiety & depression due to failure in exams during the onset of symptoms. Another case i.e., cut throat injury, was very interesting. He presented with homicidal cut throat injury & was managed accordingly. But during the course he developed MTD, as a compensatory behavior. A bulge in the neck above the larynx could easily be appreciated during phonation. Then after the end of primary treatment he was given voice therapy. Associated laryngopharyngeal reflux was also treated as & when required in all the patients.

Symptoms in MTD are usually husky, hoarse, breathy and/or rough voice, decreased loudness, difficult or effortful phonation, deterioration of voice with prolonged use. Other symptoms may be present like irritation in throat, feeling tightness or a sensation of a lump in the throat, have to frequently clear the throat and increased mucus in the throat. On examination, posture of body during phonation may be poor leading to increased laryngeal & paralaryngeal tension. Increased muscle tension hamper the movement of larynx on phonation. Patient may have developed tilting of neck while using mobile phone excessively. Due to increased tone in the thyrohyoid and tongue base muscles there is elevation of the larynx and hyoid bone which stiffen the vocal folds[9] & produce anteroposterior supraglottic contraction[10] affecting the phonatory patterns. Overuse of particular muscle will cause tenderness over that particular site which can be elicited by slight pressure with forefingers. MTD patients are usually assessed by palpation for elevated laryngeal position, increased extrinsic laryngeal muscle activation[10, 11, 12, 13,15,16] shortening of the sternocleidomastoid & stylohyoid muscles[12]. Muscle misuse & non muscle-misuse dysphonia can be differentiated with increased palpable tension (Angsuwarangsee & Morrison).

Auditory perceptual features of MTD include strained or effortful voice quality, aberrant pitch, breathiness or vocal fatigue[16,17]. Physiologic features of MTD are elevated hypopharyngeal position, decreased space between hyoid & larynx and increased extrinsic laryngeal muscle tension. Hyolaryngeal elevation & excessive extrinsic laryngeal muscle activation can influence the mechanics of vocal fold vibration[9,18] and are considered important contributors to the dysphonia in MTD. MTD can be diagnosed on Transnasal fibreoptic videolaryngoscopy on the basis of presence of anteroposterior squeezing with arytenoid & epiglottic apposition severly affecting vocal fold output, shortening of vocal cord with increase in mass & stiffness, adduction of false vocal cord with ventricle compression, increased adductor muscle tone or inappropriate vocal cord closure[19]. Inappropriate closure of vocal cords can be appreciated as elliptical opening or bowing, hour glass shape, anterior chink, posterior chink, variable position of glottal opening, incomplete closure along most of the length of vocal cord. There can be a diagnostic confusion between Adductor spasmodic dysphonia and muscle tension dysphonia due to voice characteristics that can mimic each other but apart from the above discussion phonatory breaks & laryngeal airflow effectively distinguish MTD from a neurologic disorder[17, 20,21].

Voice abuse & misuse lead to the development of vocal lesions (i.e., nodules), leading to altered phonatory behaviors to compensate the glottal insufficiency. This is expected to heighten the shearing forces at the site of a lesion, enhancing its maturity[22]. This is a vicious cycle. Alternatively or in additionally development of MTD may have contributions from psychological & behavioral component which may lead to development of the vocal cord nodule, polypoidal degeneration or chronic laryngitis[23,

[24]. Voice rest during acute laryngitis can prevent MTD by avoiding training of the sensorimotor system in the presence of altered feedback. In addition to all of the above a surgery should be considered if needed in addressing etiology or the effect of MTD (like vocal cord nodule). Management of MTD is multidisciplinary involving otorhinolaryngologist, psychotherapist and general physicist. Interrelationship of the precipitating factors can be divided into four "platforms":

Posture & muscle usage: An improper posture during phonation itself can lead to imbalance in the laryngeal musculature leading to MTD. Straight head, neck & back, relaxed shoulder (no drooping of shoulder), correct breath support in relaxed or unstrained manner are the necessity for proper phonation.

Behavioral & environmental factors: An understanding of the environmental & behavioral factors on phonation allows their application in management of MTD. Environmental factors like dust, smoke, dry air, poor acoustics or amplifications, background noise & inadequate rest during phonation should be corrected. Faulty behavior of the patient's like throat clearing or coughing, dehydration, voice abuse and misuse etc. should be corrected in order to treat MTD efficiently & effectively.

Laryngopharyngeal reflux: This is usually the cause of patient's faulty behavior & is also a predisposing factor for MTD[25]. Management of this should be included in the management of MTD.

Psychological: Patient's anxiety, emotional distress, psychological status need to be addressed in order to manage MTD. Patient should be reassured about the disease that there is no serious pathology & thorough explanation of anatomy & physiology of the vocal tract is needed. If there is any other psychyological problem then it should be addressed accordingly with the help of psychotherapist. All these, will help the patient to relax, be confident & also encourage him to continue the treatment properly.

CONCLUSION

MTD whether, primary or secondary, is due to imbalance in the laryngeal & paralaryngeal musculature during phonation caused by a diverse number of etiological factors viz. vocal misuse/abuse, psychological/personality disorders, compensatory vocal habits in case of upper airway infections, organic lesions and laryngopharyngeal reflux. Muscle Tension Dysphonia is diagnosed on the basis of detailed history, clinical & videolaryngoscopic examinations. Every aspect of MTD whether postural, behavioral, environmental or psychological should be considered & managed appropriately. Laryngopharyngeal reflux is needed to be treated appropriately. In cases of secondary MTD, the etiological factor like vocal cord nodule etc. should be managed surgically if needed to ameliorate the compensatory behavior. Vicious cycle of etiology & effect needs to be interfered as early as possible to stop the deterioration of voice further or to prevent the development of compensatory behavior.

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