OROFACIAL MYOFUNCTIONAL THERAPY (OMT) AS A TREATMENT FOR MOUTH BREATHING

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Respiration is a vital bodily function, supported by the stomatognathic system. The human body can survive without water for a few days and without food for weeks, but only for a few minutes without air. While we are constantly reminded of the importance of food and fluid intake, quantity and quality, we pay limited attention to the air we breathe and how we breathe.[1]

Highly refined, processed food and early introduction and prolonged use of feeding bottles and pacifiers have had a detrimental effect on the craniofacial development of recent generations. This has contributed to an increased incidence of children developing high and narrow palates, malaligned teeth and hypotonic orofacial musculature.[2] It then becomes difficult to achieve lip seal, adequate mastication, swallowing, articulation, mandible elevation/rotation and a range of movement by the tongue (ROM). Incompetent lips (Fig.1) can lead to an open mouth posture and mouth breathing habits. Lack of oxygen relates to many problems including snoring, ADHD, heart disease and chronic fatigue syndrome.[3]

Figure 1: Incompetent lips

Nasal Breathing

The nose conditions the air we breathe to a specific temperature and humidity and its protective filtration and ciliary mechanisms are abundant. Nasal reflex functions affect the lower respiratory tract and cardiopulmonary functions and respond to intense emotional situations.[4]

Correct breathing should be nasal. Breathing through your nose during the day and at night helps maintain the correct breathing volume and regulates oxygen delivery. The gas exchange, required to dilate vessels in order to distribute oxygen throughout the body and the brain efficiently, happens to a higher concentration in the nasal cavity. Nasal breathing helps reduce allergens and bacteria intake harmful to the upper and lower respiratory tract. This also aids the transfer of nitric oxide from the nostrils to the lungs. Nitric oxide occurs naturally and it has a significant effect on many body functions including the reversal of cholesterol and plaque in the blood vessels. Regulated, slow and gentle breathing increases the concentration of nitric oxide, improving blood circulation and airway dilation. [5]

Mouth Breathing

Open mouth posture may be an indicator of incompetent lips This may be due to a chronic lack of a lip seal at rest. Individuals displaying a habitual open mouth posture may have to strain other facial muscles to keep the lips closed. Other clinical signs may include a larger lower lip, hypertonic mentalis, hypotonic orofacial muscles, inflammation of the anterior gingiva, increased plaque build-up on the anterior teeth surfaces, higher incidence of decay, malocclusion and TMJD.[6]

Dental occlusion and craniofacial growth:

Mouth breathing can affect not only teeth alignment but also the development of the craniofacial structure. This can have a negative effect on the growth and appearance of the face and jaws.[7] This is because poor function can directly affect the size and shape of bone. One bone-loading stimulus can evoke three adaptational responses: resorption, apposition and maintenance. Bones are directly stimulated (mechanically, electrically and biomechanically) by the soft tissues, especially muscles and fascia.[8]

The size and the shape of the bone is a direct representation of the function and posture it performs or carries out. Bone elements once formed rearrange themselves in the direction of the functional pressure and increase or decrease their mass to reflect their functional stress. This is known as Wolff's Law, also known as the law of orthogonality.[9]

Mouth breathing can affect much more than the craniofacial structure, musculature and dental health. It can also affect an individual's general wellbeing, communication and mental health.

Speech: Approximately 31% of children diagnosed with chronic mouth breathing, a common symptom of OMD, exhibit an articulation disorder.[10]

Sleep: Mouth breathing at night can cause snoring, increasing the likelihood of developing sleep apnea (SA) and sleep disorder breathing (SDB). OMT can be instrumental in the treatment of SDB and SA.[11]

"When we breathe in through the nose, the air passes over the curved part of the soft palate in a gentle flow into the throat without creating unnecessary turbulence. When we breathe in through the mouth however, the air hits the back of the throat 'head on' and can create enormous vibrations in the soft tissue." [12]

Cognition and behaviour: Individuals who habitually breathe through the mouth are more likely than nasal breathers to have sleep disorders and attention deficit hyperactive disorder. [13]

Emotional judgement and memory recall: North-western medicine scientists have discovered for the first time that the rhythm of breathing creates electrical activity in the human brain that enhances emotional judgments and memory recall.[14]

For diagnosis, mouth breathing may be categorised:

Habitual: When correct nasal breathing behaviour was never established, or interrupted by an acute period of blocked nose, it develops in to a habit (e.g. recurrent colds, sore throats, undiagnosed allergies to animal fur, dust, mould, grass, etc).

Obstructive: Associated with chronic allergies or enlarged tonsils.

Anatomic: An individual is simply unable to take in enough air

through the nose, which may be due to, for example, collapsible nostrils, deviated septum, nasal polyps or unilateral obstructions.[15]

Tethered Oral Tissues (Tots)

TOTs, or restricted fraena, are remnants of embryological tissue which can interfere with the normal function of the tongue, lips and cheeks (Figs. 2-4). Lip ties can impact lip seal, restricting the lips' movement and ability to close.[16] A tongue tethered or anchored to the floor of the mouth adds weight to the mandible, contributing to an open mouth posture during the day and at night. Although the tongue is attached to the lower jaw, its resting spot should be on the palate where it acts as a natural palate expander during craniofacial development. It doubles in size from birth to adulthood to become a palatal retainer.[17] Untreated tongue ties can contribute to feeding issues during infancy and childhood and for many people these issues can continue through adulthood. They can affect feeding, sleep quality, mouth breathing, growth and development of the jaws.[18,19]

OMT in the Treatment of Mouth Breathing

Orofacial Myofunctional Therapy (OMT) is an umbrella term for the treatment of myriad abnormal behaviours that interfere with normal orofacial muscle functioning and/or dentofacial development. OMT has long been targeted towards the elimination of noxious oral habits and the retraining of tongue habits and postures (tongue thrust, low tongue posture, reverse swallowing). Modern OMT practice has expanded to include the management of disorders, including mouth breathing, obstructive sleep apnea, forward head posture, tongue thrust, some aspects of speech pathology, malocclusions and open bites, various parafunctional habits and dysphagia.[20]

OMT uses a variety of carefully developed and timely applied exercises. It seeks to retrain and bring functional stability to the stomatognathic system. This is achieved with the neuromuscular re-education of the muscle involved and the retraining of nasal

Figure 2: Tongue tie

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breathing and breathing patterns. OMT and breathing re-education have the added benefit of improving facial appearance, complexion and tone.

Orofacial myofunctional therapists employ a multidisciplinary and holistic approach, involving clinicians from different specialities. An orofacial myofunctional therapist with advance training in TOTs assessment will be able to recognise, report and refer patients for a functional TOTs release.

Below are examples of orofacial myofunctional exercises designed to strengthen musculature and restore function. These exercises are performed with repetitions (isotonic) and holding position (isometric)(Figs.5-8).

Tongue extension and lateralisation: Strengthening the intrinsic and extrinsic muscles of the tongue, improving tongue ROM muscle and strengthening of the oropharyngeal muscles (Fig. 5).

Mandible rotation: Working on the tongue's ROM, strengthening the oropharyngeal and the muscles supporting the mandible while helping to release tension from the TMJ (Fig. 6).

Lip conditioning: Strengthening and correcting the function of the orbicularis oris to help achieve good lip seal (Fig.7).

Tongue to palate suction: Strengthening several muscles including the intrinsic and extrinsic muscle of the tongue, posterior fibres of the genioglossus, mylohyoid, anterior belly of digastric, medial pterygoid, and intrinsic tongue (Fig. 8).[21,22]

Figure 3: Lip tie

Figure 4: Buccal ties

Summary

Mouth breathing affects several systems causing an array of symptoms that can go on for many years undiagnosed, untreated and unresolved. Often these symptoms are treated by an individual symptom approach although many are often connected, causing a cascade of ill effects on the body. This approach often leaves people dealing with chronic pain, discomfort and having to accustom themselves to the side effects of the medications and treatments prescribed.

Hypotonic orofacial musculature and TOTs can have an ill effect on the craniofacial development and functionality of the stomatognathic system, affecting the functions it supports:

- Respiration
- Deglutition
- Speech
- Olfaction
- Mastication
- Maintenance of head posture [23]

OMT can be instrumental and effective in the treatment and correction of mouth breathing, the re-education of exclusive nasal breathing and the neuromuscular re-patterning of the orofacial complex.

The current National Institute for Health and Care Excellence (NICE) guideline on the Management of the Developing Dentition and Occlusion in Paediatric Dentistry recommendations on oral habits states:

"Habits of sufficient frequency, duration, and intensity may be associated with dentoalveolar or skeletal deformations such as increased overjet, reduced overbite, open bite, posterior crossbite, or increased facial height. The duration of force is more important than its magnitude; the resting pressure from the lips, cheeks, and tongue has the greatest impact on

Figure 5: Stregthening the lips, oropharynx, tongue and muscles supporting the TMJ

tooth position as these forces are maintained most of the time."

"The dentist should evaluate habit frequency, duration, and intensity in all patients with habits. Intervention to terminate the habit should be initiated if indicated, and parents should be provided with information regarding consequences of a habit as well as tools to help in elimination of the habit." [24]

Awareness of mouth breathing and a robust knowledge of the importance of nasal breathing are imperative to ascertain the extent of our patients' complaints and help them identify the cause.

Figure 6: Strengthening the Orbicularis Oris

Figure 7: Strengthening the intrinsic and extrinsic muscles of the tongue

Figure 8: Strengthening several muscles of the tongue

Knowledge of the clinical signs and symptoms of mouth breathing, and the effects it has on the body, brain and general wellbeing, will enable us to refer appropriately and direct our patients towards adequate treatment options.

About the author:

Yulli is a Dental Hygienist and Therapist who graduated from King's College London. She is the Founder and Director of My Dental Hygienist Clinic and Myofunctional Therapy UK based in Hinchley Wood Practice. She is the Founding President of the British Society of Myofunctional Therapy, raising public and professional awareness of Orofacial Myofunctional Disorders (OMDs), highlighting the early signs of Sleep Disorder Breathing (SDB) and its correlation with poor orofacial development and mouth breathing. She currently practices from her own clinic.

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For more information on OMT training, congresses, summits and continued education, please visit: www.bsmft.org.uk

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