Bruxism – Friend or Foe?

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Bruxism – Friend or Foe?

• Goals of talk to provide some clinical insights in the potential role that sleep bruxism (SB) may play in maintaining upper airway patency during sleep.
Sleep Bruxism

• Sleep related movement disorder with potential significant load challenge to teeth and orofacial structures.

• Concept of primary versus secondary?
Clinical Continuum of Sleep Disordered Breathing (SDB)

• Primary Snoring
• Increased Upper Airway Resistance (?sleep bruxism)
• Sleep Apnea
• Nocturnal Hypoventilation ➔
• Chronic Alveolar Hypoventilation ➔

Progression can take months, usually years and even decades!

Theoretical impact of preventing snoring is not insignificant and dental medicine is in an enviable position.

Exploring the Interface between sleep bruxism and snoring/UARS
An Over Generalization

Everyone who snores will someday get sleep apnea, if they live long enough.

Making the case for not even snoring!
Evolution of Increasing Upper Airway Resistance/Obstruction

- “window shade” analogy of palatal ptosis.
What About “Simple Snoring?”

- Snoring in pregnancy is associated with increased hypertension and growth retardation, controlling for weight, age, smoking (Franklin, Chest, 2000).
- Snoring is associated with cognitive decline (Quesnot, J Am Geriatric Soc, 1999).
- Snoring medical students are more likely to fail exams, controlling for BMI, age, sex (Ficker, Sleep, 1999).
- Snoring is a risk factor for cardiovascular disease in women. (Hu, J Am Coll Cardiol 2000).
- Snoring is a risk factor for type II diabetes (Al-Delaimy, Am J Epidemiol 2002).
- Snoring women have faster progression of CAD (Leineweber C. Sleep 2004).
Normal Breathing During Sleep

Nasal respiration is optimal.
Asymmetry of Tongue and Jaw Size may predispose to Sleep Bruxism (Normal vs. Abnormal)
Normal vs. Obstructed Airway

Normal Airway
- Air passes through the nose and flexible structures in the back of the throat (soft palate, uvula and tongue).
- During sleep the muscles relax but, normally, the airway stays open.

Obstructed Airway
- OSA is a situation in which the entire upper airway is blocked causing air flow to stop.
- Snoring is the vibration of the pharyngeal soft tissues as air passes through.
CPAP and OA Treatment
(ideally enabling nasal respiration)
Dental Medicine Quick Start into Dental Sleep Medicine

- Start with your own patients by treating their...
Bruxism

PARAFUNCTION

Or

PROTECTIVE FUNCTION??
Parafunction

- Physical behavior that is without functional purpose and may be potentially harmful.
Protective Function?

- Physical behavior that is intended, whether conscious or subconscious, to improve survival.
Pharyngeal Patency

- While awake, the pharynx is always held open except during swallowing.
- This is accomplished by reflexes controlling the activity of pharyngeal muscles.
- During sleep, reflex control of the pharyngeal muscles is lost.
- During sleep, the pharyngeal airway can narrow severely or close completely.
Defining Sleep Bruxism (SB)

- **Possible SB**—teeth grinding, clenching, by history.
- **Probable SB**—teeth grinding etc. and clinical evidence of teeth wear.
- **Definite SB**—teeth grinding and wear, plus EMG evidence of RMMA.

“Chairside” Diagnosis of SB

• Reports of tooth grinding or tapping by bed partner or family member.
• Presence of tooth wear on exam.
• Presence of masseter muscle hypertrophy on voluntary contraction.
• Hypersensitive teeth in the AM.
• Clicking or locking of TM joint.
• Tongue indentations of lateral grooves.
Masticatory EMG Activity During Sleep

3 Types:

Background motor activity:
  1) physiologic- swallowing
  2) non-specific- face scratching, head motion

Specific pattern:
  3) Rhythmic Masticatory Muscle Activity (RMMA)
     - phasic or tonic tooth grinding
Rhythmic Masticatory Muscle Activity (RMMA)

- EMG marker for diagnosing SB
- Most events in NREM sleep
- 60% of young “normal” subjects without history or clinical evidence of SB demonstrated an RMMA index of 1.8.
- Among those with a history and clinical evidence of SB, the RMMA index was 5.8.

Rhythmic Masticatory Muscle Activity (RMMA)

• Characterized by repetitive phasic and/or tonic contractions of masticatory muscles, and can be definitively identified by EMG signals and audio-video.

• In OSA patients, whose sleep is fragmented by arousals, arousals induced by apnea are rarely associated with RMMA.

Adults with Sleep Bruxism

• 30% have snoring or OSA
• Odds ratio 1.4-2.8 for SB within snoring adults
• Odds ratio 1.8 for SB within adults with OSA

Oral Appliance therapy

• Works by increasing the upper airway space (retro-lingual) by pulling the mandible and tongue in an advanced position.
• Effective in SB treatment by reducing the occurrence of RMMA.
• More effective than unimaxillary appliances in reducing RMMA.
Occlusal Splints

- Have been reported to exacerbate apneas and hypopneas in patient with OSA

A typical professional grade "Boil and Bite" showing significant bulk and lack of tongue space.
Temporary oral appliance
Linking Dentistry to Sleep Medicine

• Sleep bruxism identification and management unites both the dental and sleep communities for the betterment of patient care as well as the potential earlier diagnosis of OSA for many susceptible patients with sleep bruxism.

• Dentists need to be made aware that SB can be an isolated entity or associated with other sleep disorders, in a given single patient.
Bruxism and Sleep Apnea in Children
Before T&A surgery, all 69 children presented with sleep apnea and 45.6% presented with bruxism. Malocclusion was found in 60.71%. Three months after surgery none of the children presented breathing problems and only 11.8% presented bruxism. There was no difference in malocclusion.

CONCLUSIONS:
• This study suggests that there is a positive correlation between sleep-disordered breathing and bruxism.
• There was a marked improvement in bruxism after T&A surgery.
Sleep bruxism related to obstructive sleep apnea: the effect of continuous positive airway pressure.

Oksenberg A, Arons E.

During the CPAP titration night most breathing abnormalities were eliminated and a complete eradication of the tooth grinding events was observed. The results of this study suggest that when sleep bruxism is related to apnea/hypopneas, the successful treatment of these breathing abnormalities may eliminate bruxism during sleep.
OSA Risk Factors

- BMI > 30
- Neck circumference > 16in
- High arched palate
- Micro/retrognathia
- Mallampati class III / IV airway
Snoring and Evolving Mallampati Score

Class 1  Class 2  Class 3  Class 4
Mandibular Tori

- Benign boney growth of mandible along the surface nearest to the tongue.
- Usually located bilaterally by premolars.
- Associated with bruxism.
- May fluctuate in size.
- Caused by increased mechanical stress on tooth with secondary bone growth.
- Competes with tongue for lower jaw space.
Mandibular Tori and Lingual Competition for Lower Jaw Space

- Tori will compete with tongue for lower jaw space, resulting in a more posterior lingual position that can increase the upper airway resistance in a susceptible patient.
Unusual Bruxism Signs/Symptoms

• Inadvertent tongue biting when chewing food or gum. Location, location, location.
• Inadvertent cheek chewing.
• Lingual grooves along lateral edge.
Are some Dentists Accidental Sleep Doctors?

And they don’t know it!!!
Accidental Sleep Doctors?

Accidental for better or for worse?
Acci...Dental
Unique position of Sleep Dentistry

• Dentists are in the “driver’s seat” when it comes to generating appropriate patient referrals for a sleep evaluation.

• What other healthcare professional spends so much time at the “point of origin” or “ground zero” of OSA?

• What other healthcare professional can directly observe the oral-pharyngeal airway when supine and possibly during episodes of sleep?

• What other healthcare professional actually can have their patient “sleeping” while they do all the work?
Suggested Protocol

• Screen ALL your patients for bruxism, snoring and sleep apnea (Epworth, STOP-BANG, Bruxism Questionnaire)

• Consider the referral of your patient to a sleep physician for consideration of a sleep evaluation (sleep study or sleep consultation) depending on your protocol and the pretest probability for OSA.

• Follow up with your patient for creation of a long term treatment plan based on sleep results and clinical response.
Recognition of Sleep Disorders at the "Chairside"

• Dentists are literally in the best position to screen and identify patients with potential sleep disorders, through their clinical interviews and oral examinations.

• With the support of sleep specialists, it is likely that more patients will receive the necessary care, when SB is considered a potential ramification of increased upper airway resistance in certain patients with a clinical predisposition for OSA.
QUESTIONS?

• There is no such thing as a bad question..... only a bad answer!
Thank you for your time and attention!
OSA Therapeutic Continuum
best with Sleep Dental and ENT input

• After OSA dx, usually starts with CPAP therapy.
• OSA Dx $\rightarrow$ initiation of CPAP therapy ideally with a nasal interface.
• After years of ongoing and successful CPAP therapy, emergence of a significant mouth leak or “lip leak” can occur seemingly spontaneously
• WHY????
OSA Therapeutic Continuum

• Mallampati score may have changed from a class 4 to 3.
• It may now be the time to consider an OA as opposed to a FFM in most patients.