Disclosure to Participants

- Notice of Requirements For Successful Completion
  - Please refer to learning goals and objectives.
  - Learners must attend the full activity and complete the evaluation in order to claim continuing education credit/hours.

- Conflict of Interest (COI) and Financial Relationship Disclosures:
  - No COI/Financial Relationship to disclose.

- Non-Endorsement of Products:
  - Accredited status does not imply endorsement by AADE, ANCC, ACPE, or CDR of any commercial products displayed in conjunction with this educational activity.

- Off-Label Use:
  - Participants will be notified by speakers to any product used for a purpose other than for which it was approved by the Food and Drug Administration.

A Good Night’s Rest: Diabetes and Sleep

- "Endothelial dysfunction is a well established response to cardiovascular risk factors and precedes the development of atherosclerosis... is involved in lesion formation by the promotion of both the early and late mechanisms of atherosclerosis including up-regulation of adhesion molecules, increased chemokine secretion and leukocyte adherence, increased cell permeability, enhanced low-density lipoprotein oxidation, platelet activation, cytokine elaboration, and vascular smooth muscle cell proliferation and migration... When cardiovascular risk factors are treated the endothelial dysfunction is reversed and it is an independent predictor of cardiac events."

Endothelial Dysfunction & Health Conditions

Sleep
- Essential for growth & repair, hormonal, metabolic, & restorative processes
- 5 different stages: 1, 2, 3, 4 & REM
  - stages 3 & 4 constitute deep sleep (restoration & repair occur, metabolic activities slow)
  - REM is where we dream & lose muscle tone. This is the stage of sleep most commonly associated with sleep apnea

Who Has Sleep Apnea?
45 yo female
Type 1 DM
BC of 22%
Neck size 12

70 yo male
Type 2 DM
BC of 41%
Neck size 17

Mechanics of Sleep Apnea:
- Air passes through upper airway to lungs
- Tissues collapse & block the airway
- Cessation of breathing causes $O_2$ desaturation

Sleep Apnea in Kids
- Bed-wetting
- ADHD
- Sleep walking
- Stunted growth
- Failure to Thrive
- Chronic mouth breathing
- Deviated septum
- Obesity
- Long pauses in breathing
- Snoring
- Tossing & turning
- Night sweats
- Night terrors / nightmares
- Teeth grinding
Risk Factors:
- Age 40 or older (males have higher tendency)
- Obesity
- Large adenoids/tonsils
- Deviated septum
- Jaw issues
- Smoking
- Neck size/circumference: 17" or > for men, 16" or > for women
- Soft palate issues
- Menopause
- Down Syndrome
- Cerebral Palsy

Classification of Sleep Apnea
- Obstructive (OSA): most common form
- Central: less common but more serious
- Mixed: fragmented sleep d/t frequent arousals

Apnea-Hypoxia Index (AHI) and Sleep Apnea Classification
- Mild sleep apnea: AHI of 5 – 15
- Moderate sleep apnea: AHI of 15 – 30
- Severe sleep apnea: AHI of 30 or more

NIH Conference:
Action Items:
- "Be Smart, Sleep Right": improve sleep & behavior by improving sleep by providing sleep education
- ↑ detection of sleep disorders in students @ risk for academic failure = education of family, teachers, healthcare providers

NIH Conference:

Action Items:
• “Feel good & Be productive”: teach people that lack of sleep impacts cognition & performance
• Recognize untreated sleep disorders as a contributing factor to cognitive impairment
• dx & tx of sleep disordered breathing
• Professional education to incorporate sleep hx in pt evaluations

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The correlation of anxiety and depression with obstructive sleep apnea syndrome.

CONCLUSION: Our study showed that the frequency of anxiety in OSAS patients is higher than in the general population regardless of the gender. Furthermore, it is more likely that OSAS patients present with anxiety and depression than the typical symptoms.
Education of the Healthcare Provider:

<table>
<thead>
<tr>
<th>Body System</th>
<th>Family / Patient History</th>
<th>Symptoms</th>
<th>Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>Angina, chest pressure, neck pain, paleness, HBP</td>
<td>HTN (systemic, ischemic, peripheral), CHF, AF, dysrhythmia, CHA2DS2-VASc, CVA, TIA, sudden death, increased troponins, elevated fibrinogen, anemia, COPD, PVD=n</td>
<td></td>
</tr>
<tr>
<td>Neurological</td>
<td>Morning headache, personality change, depression, anxiety, decreased memory / concentration, excessive daytime sleepiness, insomnia, ADHD, pain</td>
<td>Inappropriate answers, napping, guaifenesin, slow changes</td>
<td></td>
</tr>
</tbody>
</table>

Screening Tools:

• STOP-Bang
  - S: do you Snore loudly
  - T: are you Tired
  - O: has someone Observed cessation of breathing
  - P: do you have or being treated for high BP
  - B: Body mass index
  - A: are you Age 50 or older
  - N: Neck size (women:16” or >; men 17” or >)
  - G: Gender

• Epworth Sleepiness Scale (ESS):
  - As a passenger in a car for an hour without a break
  - Lying down to rest in the afternoon
  - Sitting in traffic in a car
  - Sitting and reading
  - Sitting and being inactive (i.e. in a meeting)
  - Sitting quietly at lunch without ETOH
  - Sitting and speaking with someone
  - Watching TV

• Berlin Questionnaire:
  - 10 questions in 3 areas of concentration
    1. Excessive daytime sleepiness
    2. History of HTN or obesity
    3. Severity of snoring
  - High risk = “yes” answer in 2 or more areas
  - Drawback: very time-consuming
• Pittsburgh Sleep Quality Index (PSQI):
  - 10 questions with sub-questions in areas of sleep
    • Disturbance
    • Duration
    • Efficiency
    • Latency
    • Quality
    • Use of medications for sleep
    • Impairment as it relates to wakefulness

• Pronged Physical Exam:
  - Characteristics assessed:
    1. Low hanging soft palate
    2. Recessed chin
    3. Large neck circumference

• Mallampati Classification:
  - 5 classes:
    0: with mouth opened & tongue protruding, clinician has ability to see any part of epiglottis
    1: soft palate, uvula, & arches visible in front of & behind tonsils
    2: can see soft palate, uvula, & arches in front of tonsils
    3: visibility of soft palate & base of uvula
    4: unable to see soft palate, only hard palate visible

• Endothelial Dysfunction & Sleep Apnea

• Chronic Care Model

• Treatment Options:
  - Auto PAP, BiPAP, CPAP
  - Dental appliance
  - Surgery
  - Lifestyle modification
Benefits of Treatment

- Less fatigue / more energy
- Improved BP
- Improved BG
- Improved memory
- Improved quality of life
- Improved insulin sensitivity
- Weight loss

Questions?

References


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