Sleep Apnea and Stroke Risk: Sound the Alarm!

Michelle Valrelunga, RN MS CNRN SCRN
Stroke Program, Data/Quality Coordinator

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What will we learn today...

- What is sleep apnea?
- Types of sleep apnea and degrees of sleep apnea
- Symptoms of sleep apnea
- Causes and Risk factors
- Effect of sleep apnea on blood vessels in the brain and heart
- What can be done to treat it?
- Is it worth the trouble? Does treating it reduce your stroke risk?
- How can I get tested or get a sleep study scheduled?
First: Does this look familiar?

I'm worried that you may have a sleeping disorder, Roy.

Sometimes at night you stop breathing, and I have to poke your arm.

Well, that explains the mysterious bruises I keep finding in the morning.
Let’s Face Facts

- 1 in 5 adults suffer from at least mild sleep apnea
- Sleep apnea affects men more than women
- 35% of people with high Blood Pressure have obstructive sleep apnea
- 17% of 50-70 year old men and 9% of 50-70 year old women have moderate to severe sleep apnea
- Undiagnosed sleep apnea has a huge economic cost and is linked to workplace accidents, MVAs, lost productivity and co-morbid diseases. 150 Billion $ in 2015!
Is Sleep Apnea a Hidden Health Crisis?

Prevalence, Diagnosis and Treatment of OSA in the United States

U.S. Adult Population 245.2 M

12%

Prevalence OSA (AHI>5) 29.4 M

Undiagnosed 23.5 M

80% 20%

Diagnosed 5.9 M

85% 10% 5% 100%

CPAP 5 M

Oral Appliances 0.6 M

Surgery 0.3 M

Lifestyle 5.9 M

YES!

From the American Academy of Sleep Medicine Report in 2016
What are some risk factors for developing sleep apnea?

- Obesity - abdomen, and throat
- High Blood Pressure
- Narrow Airway – anatomy
- Smoking
- Chronic nasal congestion
- Diabetes
- Male sex
- Family history
- Asthma
Symptoms of Sleep Apnea

Snoring
Excessive Daytime Sleepiness
Gasping or choking during sleep
Dry mouth or sore throat in the morning
Morning headache
Witnessed pauses in breathing during sleep

Associated with other medical problems:
hypertension, diabetes, depression, insomnia
What is Sleep Apnea?

Obstructive Sleep Apnea
During sleep, gravity and muscle relaxation allows the tongue and surrounding soft tissues to fall back into the throat area, obstructing air flow.

Periods of interrupted or stopped breathing or very shallow respirations during sleep
Types and Degrees of SA

OSA- Disorder DIAGNOSIS Criteria:
Sleep study sonography reveals 5 or more obstructive respiratory events – 10 secs or more - (apneas, mixed apneas, hypopneas or RERAs) per hour of sleep.
  With symptoms
  Or 15 events without symptoms

<table>
<thead>
<tr>
<th>Severity</th>
<th>AHI per Hour</th>
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<tbody>
<tr>
<td>None/Minimal</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>Mild</td>
<td>5 - 15</td>
</tr>
<tr>
<td>Moderate</td>
<td>16 - 30</td>
</tr>
<tr>
<td>Severe</td>
<td>&gt; 30</td>
</tr>
</tbody>
</table>
What happens during sleep for patients with apnea?

Brain has “auto regulation” which senses if not enough air is coming in and wakes the person up: “AROUSAL” of 30 seconds or less, patient does not remember them- may not be aware.

**Multiple arousals** lead to interrupted sleep and person does not reach restful phases of deep sleep for cell recovery.

Transition from stage N2 sleep to wakefulness showing arousal: Atlas of Sleep Medicine, Chap 3
What else happens in the body?

- Low oxygen levels in the blood cause problems everywhere but primarily in the heart and brain.
- Low oxygen raises the Blood Pressure. Several studies have documented this BP raise with hypoxia. **High BP** is the biggest risk factor for stroke.
- High BP raises the risk of developing Atrial Fibrillation which increases the risk of large strokes.
What else happens in the body?

Hypoxia or lack of oxygen triggers the release of inflammatory factors in the blood making blood vessels and cells in general over time less reactive to the stress and pressure leading to overall damage.

Hypoxia

*Sleep stroke and cardiovascular disease, Culebras, A. 2013, pg 11.*
Risk of Stroke vs other conditions with Sleep Apnea

Risks:
- Stroke
- Death (severe OSA)
- Hypertension
- Motor Vehicle Accidents
- Heart Failure
- Occupational Accidents
- Death (moderate OSA)
- Type 2 Diabetes
- Depression
- Coronary Artery Disease

Increased Risk: 1.1, 1.4, 1.6, 1.7, 2.2, 2.4, 2.4, 2.9, 3.8, 3.8

From Dr. A. Culebras slides: The Many Faces of Sleep Apnea
Stroke and Sleep Apnea: Knowing you have it

• About 75% of patients hospitalized for stroke have sleep apnea, about 50% of these people did not know they have it or have the disorder under control

• Sleep disordered breathing- very common in stroke patients...

• Sleep studies should be considered in all stroke and TIA patients

What about Women with Sleep Apnea and stroke risk?

- Younger women with sleep apnea have more strokes. (age 20-35)
- Chinese study released in 2014 showed that when stratified by age, the effects of sleep apnea on stroke risk decreased with age.

(Chang CC et al, Sleep Medicine 2014 15:410)
What are other possible long term effects of sleep apnea-if not treated?

• Over time - Cortical disconnection- core of the brain is not receiving messages as it should leads to difficulty walking, mental functions, incontinence of urine, poor memory or Vascular Dementia
What are some other complications from sleep apnea?
Sleep Study: PSG What is it and how to prepare

- All night tests where technicians monitor brain waves, breathing, heart and muscle activity in a medical sleep center
- Avoid caffeine or alcohol 4 hours prior to the study
- Keep scalp dry and clean
- Loose comfortable clothing
- Sense of humor
How is sleep apnea treated?

- CPAP machines Positive Airway Pressure (PAP)
- Mouthpieces
- Surgery – upper airway hypoglossal nerve stimulation – used if mask is not an option for severe cases
- **Weight loss**
- Suggest first using the CPAP mask for short stints during the day while you read or watch TV to become comfortable with the mask
- Treat other nasal stuffiness or mouth issues
- Avoid alcohol before you sleep
CPAP options

• CPAP assistance program at sleepapnea.org
• Several choices of equipment
• Some download information
• Face mask, nasal pillows,
• Most important to use it - check insurance also
Is the SA treatment worth the trouble?

Research Says:
“CPAP has shown to significantly reduce SBP at night in patients with sleep apnea and hard to control BP”
“CPAP use is shown to delay initiation or slow progression of cognitive changes”

Patient Says:
Yes People who used to fall asleep at points in the day, at traffic lights etc, are report that it does not happen after CPAP use
Yes People report better productivity at jobs and more energy
Yes Partners are no longer disturbed!
Does SA impact recovery from stroke?

- Yes, especially patients with moderate to severe sleep apnea
- Poor memory
- Not motivated
- Rehab skills poor, much slower
Who should absolutely be screened for sleep apnea?

- Doctors and Nurses use the STOP BANG Scale to screen you in the hospital or clinic
- 1. Higher score = more at risk for apnea
- 2. Patients on 3 more medications for BP
- 3. African Americans

STOP-Bang Questionnaire

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>Snoring (Do you snore loudly?)</td>
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<tr>
<td>Tiredness (Do you often feel tired, fatigued, or sleepy during the daytime?)</td>
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<tr>
<td>Observed Apnea (Has anyone observed that you stop breathing, or choke or gasp during your sleep?)</td>
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<tr>
<td>High Blood Pressure (Do you have or are you being treated for high blood pressure?)</td>
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<tr>
<td>BMI (Is your body mass index more than 35 kg per m²?)</td>
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<td>Age (Are you older than 50 years?)</td>
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<tr>
<td>Neck Circumference (Is your neck circumference greater than 40 cm [15.75 inches]?)</td>
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<td>Gender (Are you male?)</td>
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Score 1 point for each positive response.

Scoring interpretation: 0 to 2 = low risk, 3 or 4 = intermediate risk, ≥ 5 = high risk.
Does Losing Weight Cure Sleep Apnea?

• Yes and Yes-
  Reducing your Body mass index 25 or less has shown to cure apnea and reduce blood pressure

• Treat apnea first, as sleep apnea and not sleeping well will actually slow weight loss despite doing all other things right
What kinds of Stroke?

An interruption of blood flow to the brain which leads to brain injury.

Ischemic= “blockage”: 85%

Hemorrhagic=“bleeding”: 15%
Common Signs of Stroke

- Sudden numbness or weakness, especially on one side of the body
- Sudden confusion, trouble speaking or understanding
- Sudden trouble seeing
- Sudden trouble walking or loss of balance
- Sudden, severe headache
FAST

SPOT A STROKE

FACE DROOPING
ARM WEAKNESS
SPEECH DIFFICULTY
TIME TO CALL 911

Stroke Warning Signs and Symptoms
What Next? Panic?

• NO!!! Call 911
  • Don’t try to bring the person yourself
  • EMS communicates with the hospital and can help if symptoms worsen
  • Do not ignore the symptoms even if they go away!
  • Think: when was Last Known Well or Normal?
More Questions?

www.sleepassociation.org
Good online information

http://www.upstate.edu/sleep-center/index.php
Upstate Sleep Center – Camillus
References:

https://www.health.harvard.edu/blog/pace-breathe-new-treatments-sleep-apnea-2016072710024  Pace to breathe- new treatments for sleep apnea

Sleep Apnea Presentation – Dr Antonio Culebras, Neurologist Upstate Medical University Hospital Syracuse, Director of Upstate Sleep Center, Healthlinks on Air presentation, September 2, 2018

https://www.sleepassociation.org/sleep-disorders/sleep-apnea/sleep-apnea-screening-questionnaire-stop-bang/


The many and ugly faces of sleep apnea: Antonio Culebras, MD Neurologist presentation at RUSH conference slides, September 2018

Sleep Apnea: Residents Conference presentation slides, Antonio Culebras, MD Neurologist, March 2019.