Stroke and Obstructive Sleep Apnea

Primary Care Stroke Update

Lysa Boissé Lomax MD MSc FRCPC

Queen’s University
Divisions of Neurology and Respirology
Disclosure of Potential for Conflict of Interest
Primary Care Stroke Update: What’s New in Best Practice Prevention & Care
Wednesday March 6th, 2013

Lysa Boissé Lomax

DISCLOSURE:
No conflicts of interest.
Objectives

• Obstructive Sleep Apnea (OSA)
• Physiology
• Discuss link between OSA and Stroke
• OSA screening tools
• Treatment
Obstructive Sleep Apnea (OSA)

- Cyclic collapse of upper airway during sleep
- Cessation of airflow with hypoxemia or hypercapnia
- Can result in arousal which terminates the event
- AHI (Apnea/hypopnea index)
  - AHI < 5 (normal)
  - AHI 5 -15 (mild)
  - AHI >15 - 30 (moderate)
  - AHI > 30 (severe)

Calvin Curr Opin Cardiol 2009; AASM Manual for the Scoring of Sleep and Associated Events 2007
Epidemiology

- Affects 2-15% of middle aged population
- 24% men 9% women
- >80% untreated/undiagnosed
- 60% OF STROKE PATIENTS

From: Obstructive Sleep Apnea and Heart Failure: Pathophysiologic and Therapeutic Implications

J Am Coll Cardiol. 2011;57(2):119-127
• OSA
  – Obesity
  – HTN
  – Cardiac arrhythmia
    ex: Atrial fibrillation
  – CHF
  – Family history

• Stroke
  – Obesity
  – HTN
  – Atrial fibrillation
  – CHF
  – Diabetes
  – Hypercholesterolemia
  – Smoking
  – Age
  – Family history
• OSA
  - Obesity
  - HTN
  - Cardiac arrhythmia ex: Atrial fibrillation
  - CHF
  - Family history

• Stroke
  - Obesity
  - HTN
  - Atrial fibrillation
  - CHF
  - Diabetes
  - Hypercholesterolemia
  - Smoking
  - Age
  - Family history
- OSA
  - HTN
  - Atrial fibrillation
  - CHF
  - Insulin resistance
  - Hypercoagulability

STROKE
Untreated OSA Increases Stroke Risk…

• By how much?
  – It doesn’t!
  – 4x
  – 10x
  – 20x
Untreated OSA Increases Stroke Risk…

- **By how much?**
  - It doesn’t!
  - 4x
  - 10x
  - 20x

- Compared to pts with AHI<5
- 3x increased risk of MI

- **CPAP Treatment reduces risk by 60-70% (NNT 3.5)**

What is the most effective treatment for resistant hypertension in OSA patients?

- Beta blockers
- ACE inhibitors
- CPAP
- Alpha blockers
What is the most effective treatment for resistant hypertension in OSA patients?

- Beta blockers
- ACE inhibitors
- CPAP
- Alpha blockers

• Correlation INDEPENDENT of other comorbidities
• TREATMENT of OSA can lower BP in patients with resistant HTN

Peppard NEJM 2000; Duran-Cantolla BMJ 2010; Lozano J Hypertension 2010
Which of these cardiac arrhythmias occurs as a result of OSA?

- Paroxysmal atrial fibrillation
- Non-sustained ventricular tachycardia
- Premature atrial complex
- Sinus bradycardia
- Sinus pauses
- Premature ventricular complexes
Which of these cardiac arrhythmias occurs as a result of OSA?

- Paroxysmal atrial fibrillation
- Non-sustained ventricular tachycardia
- Premature atrial complex
- Sinus bradycardia
- Sinus pauses
- Premature ventricular complexes

- Increased sympathetic tone
- Increased risk of nocturnal death
- Increased risk of death overall (4x)

Gami NEJM 2005; Leung Am J Respir Crit Care Med 2001; Yaggi 2005
Screening for OSA

- **Questionnaires**
  - STOP / STOP-Bang
  - Berlin Questionnaire
  - Wisconsin Sleep Questionnaire

- **Clinical history**
  - Bed partner has heard snoring/witnessed apnea
  - Bed partner has left the room!
  - Day time somnolence
  - Nocturia
  - Waking with a feeling of choking/gasping
Screening Tools: Overnight Oximetry
Polysomnography (Overnight Sleep Study)
Treatment

• 2” x 4” under head of the bed
• Positional treatment
  – Rematee Bumper Belt
Treatment

- 2” x 4” under head of the bed
- Positional treatment
  - Rematee Bumper Belt
  - Football in children’s backpack
- Breathe Right Nasal Strips
- Provent nose plugs
- Oral appliance
- Surgical alteration of soft palate
Treatment

- CPAP

C-CAT
Conclusion

• OSA is an independent risk factor for:
  – Stroke
  – HTN
  – Cardiac arrhythmia

• Can be screened for

• Treatment reduces stroke risk by 60-70%
• Reduces systolic and diastolic blood pressure
• Reduces risk of sudden death
Questions?
• Calvin AD and Somers VK. Obstructive sleep apnea and cardiovascular disease. Current Opinion in Cardiology 2009
• Somers VK et al., Sleep Apnea and Cardiovascular Disease. Circulation 2008
• AASM Manual for the Scoring of Sleep and Associated Events 2007
• Young T et al., The occurrence of sleep disordered breathing among middle-aged adults N Engl J Med 1993
• Artz M et al., Association of sleep disordered breathing and the occurrence of stroke. Am J Respir Crit Care Med 2005
• Valham F et al., Increased risk of stroke in patients with coronary artery disease: a 10 year follow-up. Circulation 2008
• Kuipers AF and Bartels LW. Sleep apnea. NEJM 2012
• Yaggi KH et al., Obstructive Sleep Apnea as a risk factor for stroke and death. NEJM 2005
• Dyken ME et al., Investigating the relationship between stroke and sleep apnea. Stroke 1996
• Bassetti C and Aldrich MS. Sleep apnea in acute cerebrovascular diseases: final report in 128 patients. Sleep 1999
• Leung RST and Bradley TD. Sleep apnea and cardiovascular disease. Am J Resp Crit Care Med 2001
• Buchner et al., Continuous CPAP treatment of mild to moderate OSA reduces cardiovascular risk. Am J Resp Crit Care Med 2007
• Marin JM et al., Longterm cardiovascular events in men with OSA with and without treatment with CPAP: an observational study. Lancet 2005
• Peppard et al., Prospective study of the association between sleep disordered breathing and hypertension. NEJM 2000;
• Duran-Cantolla CPAP as treatment for hypertension in people with OSA. BMJ 2010;
• Lozano J et al., CPAP treatment in sleep apnea patients with resistant hypertension: a randomized controlled trial. J Hypertension 2010