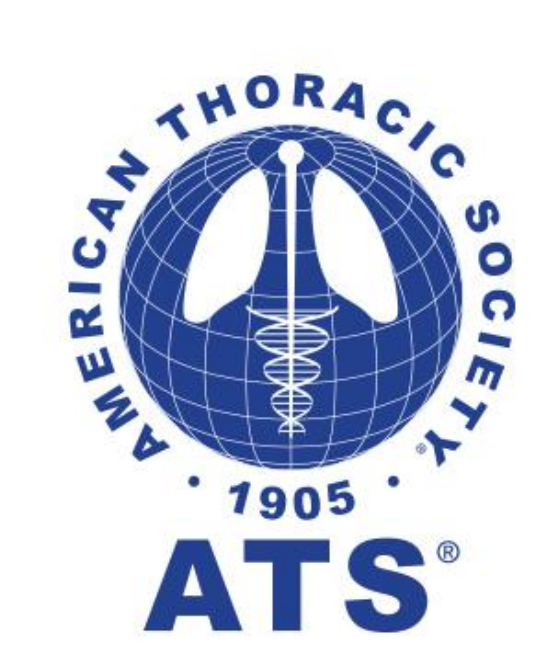




Obstructive Sleep Apnea is A Risk Factor For Intracerebral Hemorrhage



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BACKGROUND/PURPOSE

- Obstructive sleep apnea (OSA) is a common and treatable condition
- OSA is a known risk factor for ischemic stroke
- Goal: To determine if OSA is a risk factor for intracerebral hemorrhage (ICH)

METHODS

- Ethnic/Racial Variations of Intracerebral Hemorrhage (ERICH) is a prospective observational study evaluating risk factors for ICH
- Premorbid OSA likelihood was determined using the Berlin Questionnaire (BQ):

1. Complete the following:
a) Height:
b) Weight:
c) Age:
d) Gender:

2. Do you snore?
a) Yes
b) No
c) Don't Know

If you snore:
3. Your snoring is:
a) Slightly louder than breathing
b) As loud as talking
c) Louder than talking
d) Very loud – can be heard in adjacent rooms

4. How often do you snore?
a) Nearly every day
b) 3-4 times a week
c) 1-2 times a week
d) 1-2 times a month
e) Nearly or nearly never

5. Has your snoring ever bothered other people?
a) Yes
b) No
c) Don't Know

6. Has anyone noticed that you quit breathing during your sleep?
a) Nearly every day
b) 3-4 times a week
c) 1-2 times a week
d) 1-2 times a month
e) Nearly or nearly never

7. How often do you feel tired or fatigued after your sleep?
a) Nearly every day
b) 3-4 times a week
c) 1-2 times a week
d) 1-2 times a month
e) Nearly or nearly never

8. During your waking time, do you feel tired, fatigued or not up to par?
a) Nearly every day
b) 3-4 times a week
c) 1-2 times a week
d) 1-2 times a month
e) Nearly or nearly never

9. Have you ever nodded off or fallen asleep while driving a vehicle?
a) Yes
b) No

If yes:
10. How often does this occur?
a) Nearly every day
b) 3-4 times a week
c) 1-2 times a week
d) 1-2 times a month
e) Nearly or nearly never

11. Do you have high blood pressure?
a) Yes
b) No
c) Don't Know

● CATEGORY 1
● CATEGORY 2
● CATEGORY 3 (includes BMI calculation)

RESULTS

- We evaluated 3000 ICH cases and 3000 controls
 - 2896 (96.5%) completed the BQ
- 71% of cases were at high risk for OSA as compared to 52% of controls**
(OR unadjusted 2.28, adjusted 1.47)

Table 1. Characteristics of ICH Patients by Likelihood of OSA

	Low Risk	High Risk	P-value
Mean Age (SD)	832 62.50 (14.70)	2064 61.31 (13.72)	0.04
Female (%)	387 (46.5)	803 (38.9)	<0.001
Race/Ethnicity (%)			0.021
White	290 (34.9)	675 (32.7)	
Black	294 (35.3)	663 (32.1)	
Hispanic	248 (29.8)	726 (35.2)	
Lobar (%)	291 (35.0)	599 (29.0)	0.002
Mean BMI (SD)	26.79 (6.47)	29.80 (8.09)	<0.001
Hypertension (%)	537 (64.5)	1918 (92.9)	<0.001
Atrial Fibrillation (%)	79 (9.6)	260 (12.6)	0.025
CAD/MI (%)	132 (16.0)	493 (23.9)	<0.001
CHF (%)	69 (8.3)	283 (13.7)	<0.001
Hyperlipidemia (%)	308 (37.7)	1009 (49.3)	<0.001
Diabetes (%)	170 (20.4)	661 (32.0)	<0.001
Smoking Ever (%)	420 (50.7)	1109 (53.8)	0.143
Alcohol Use (%)	414 (50.2)	1103 (53.5)	0.118
Anticoagulant (%)	41 (4.9)	128 (6.2)	0.217
Antiplatelet Use (%)	142 (17.1)	430 (20.8)	0.024
Snoring (%)	381 (45.8)	1802 (87.3)	<0.001

CONCLUSIONS

- OSA is prevalent in ICH
- **OSA is a risk factor for ICH**
- Further studies are needed to assess the role of OSA diagnosis and treatment in ICH outcomes

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