

Is snoring in obese women a health concern?

Jointly Organized by
The PCOS Society (India) &
The Androgen Excess & PCOS Society (International)

Dates: June 16 - 18, 2017 Bengaluru

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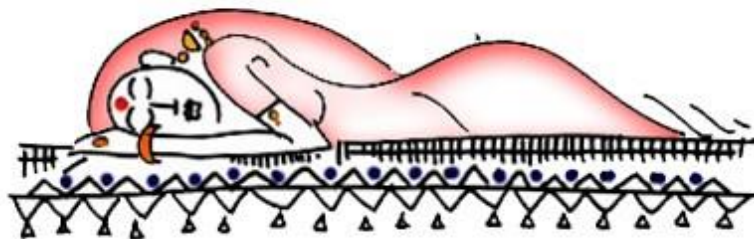
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Outline

- Snoring as a continuum to sleep apnea
- Gender Differences
- Health concerns
- Evidence
- Conclusions

Snoring

- 40% population (subjective)
- Collapse of the pharyngeal airway either due to abn upper airway anatomy &/or neural regulation → vibration soft tissue → harsh sound
- May herald underlying upper airway resistance syndrome (UARS) or obstructive sleep apnea hypopnea syndrome (OSAHS)

Snoring and Implications

Prior to 1970 Organized by The PCOS Society (India) & The Androgen Excess & PCOS Society (International)

1970's

1990s Organized by The PCOS Society (India) & The Androgen Excess & PCOS Society (International)

2017 Jointly Organized by The PCOS Society (India) & The Androgen Excess & PCOS Society (International)

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Nuisance to bed partner

Precursor to sleep apnea

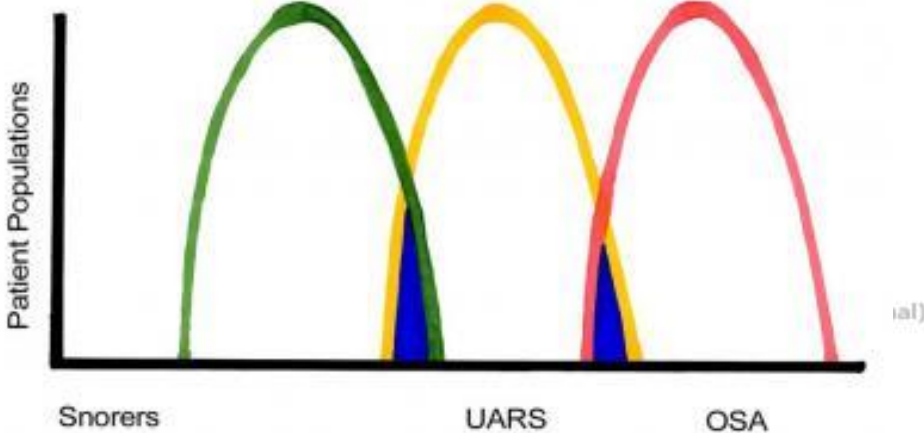
Nonapneic snoring
Increased upper airway Resistance (UARS)
(Sleep fragmentation, Arousal from sleep)

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Guilleminault C et al. A cause of excessive daytime sleepiness: the UARS. Chest 1993;104:781-787

Contributing factors

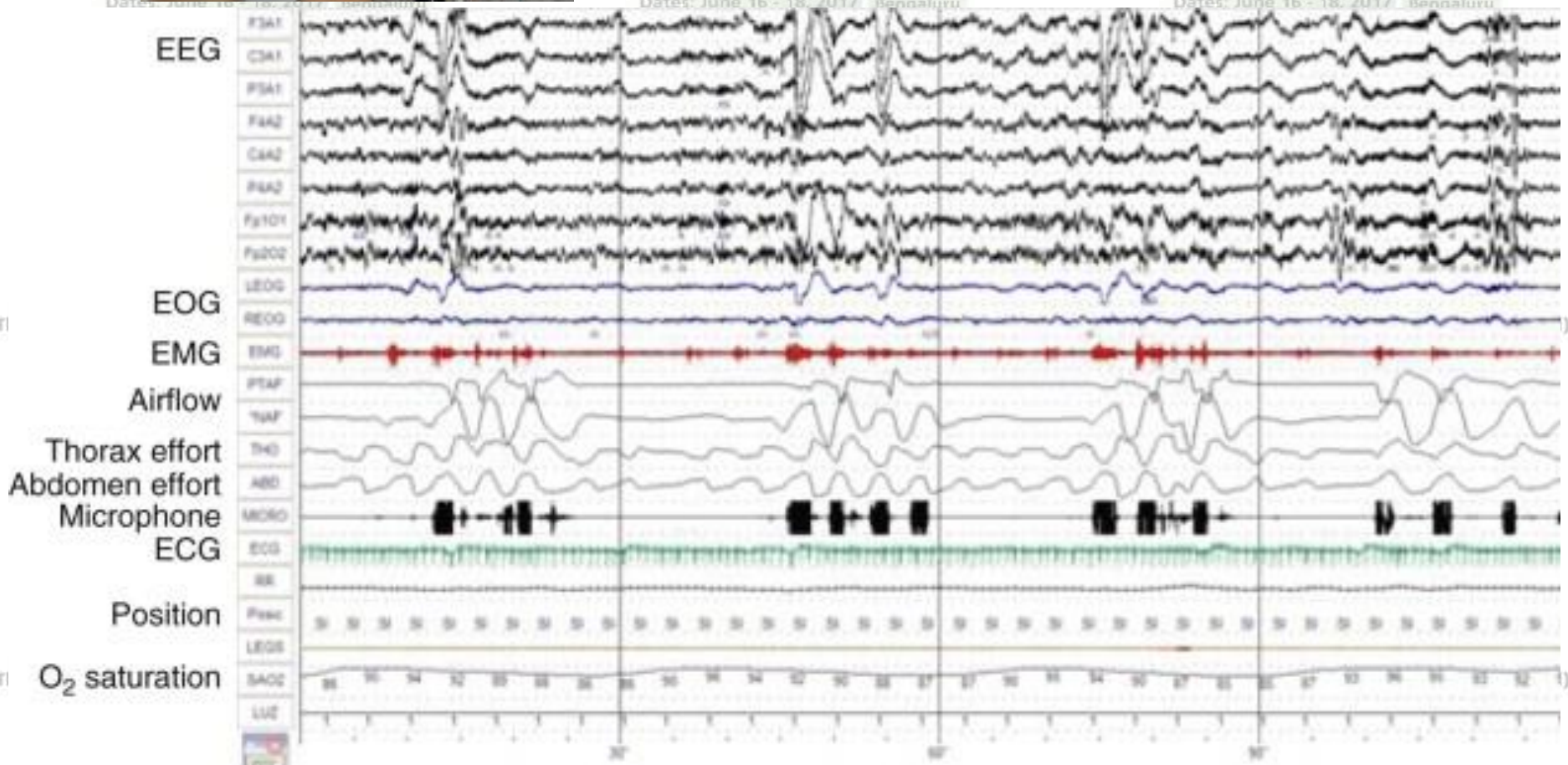
- Age
- Obesity
- Nasal Congestion
- Oropharynx – long uvula
- Alcohol and Drugs





Apnea – cessation of airflow

Hypopnea -- $< 30\%$ from baseline, with desaturation/arousal

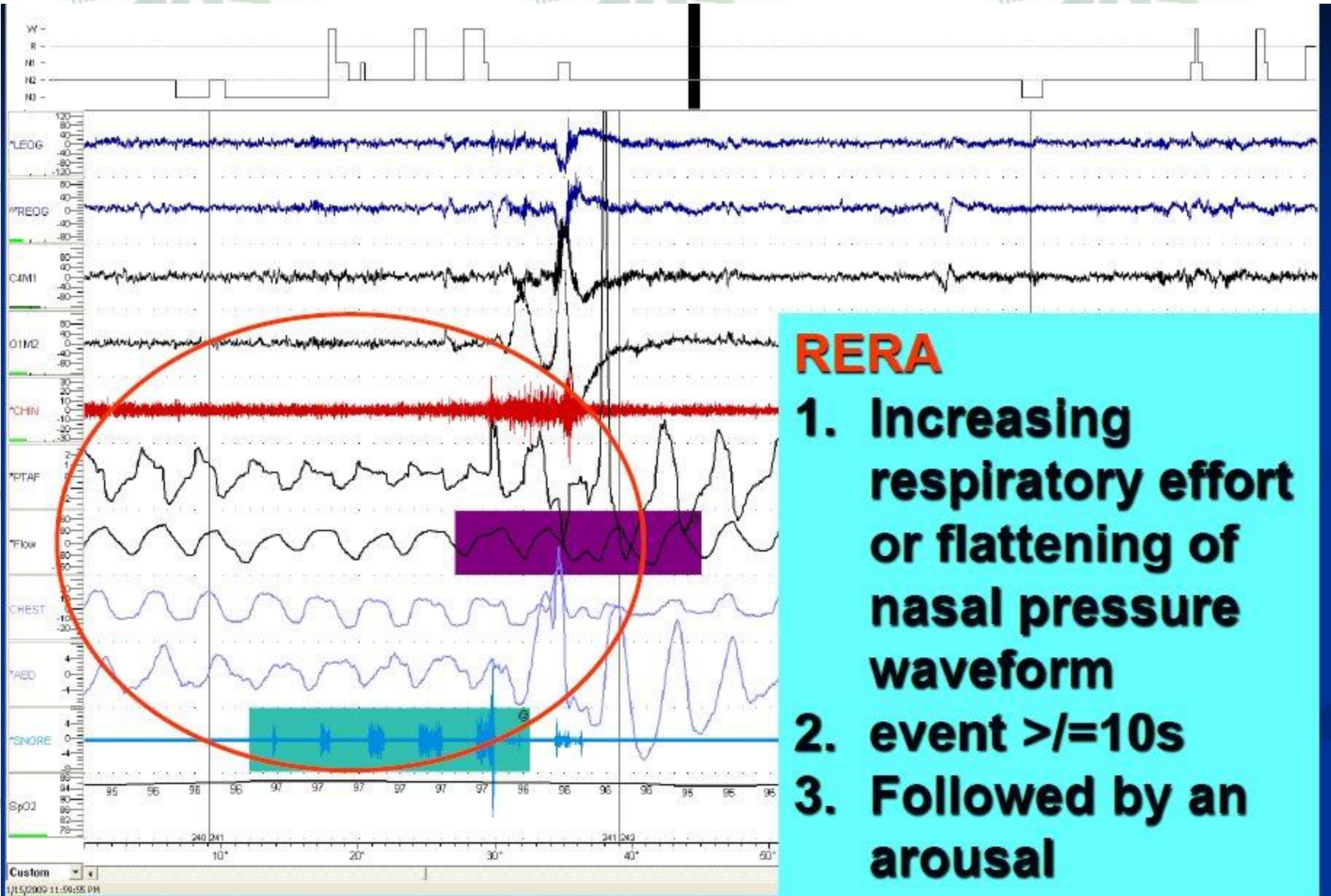


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Respiratory disturbance index – Apnea+hypopnea+Resp event related arousal



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- 5-15 events/hour: Mild OSAHS (UARS)
- 15-30: Moderate OSAHS
- > 30: Severe OSAHS

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In comparison to men:

Apneic snorers	Nonapneic snorers/UARS
Common after menopause	Higher prevalence post menopause
Higher BMI for the same level of RDI	Functional – somatic manifestations commoner (insomnia, headaches, IBS)
Delayed diagnosis commoner (incurring higher costs to healthcare)	
Thyroid dysfunction higher	

Men

Women

Higher fat distribution around the neck

Obesity higher but fat distribution different and hence incidence lesser

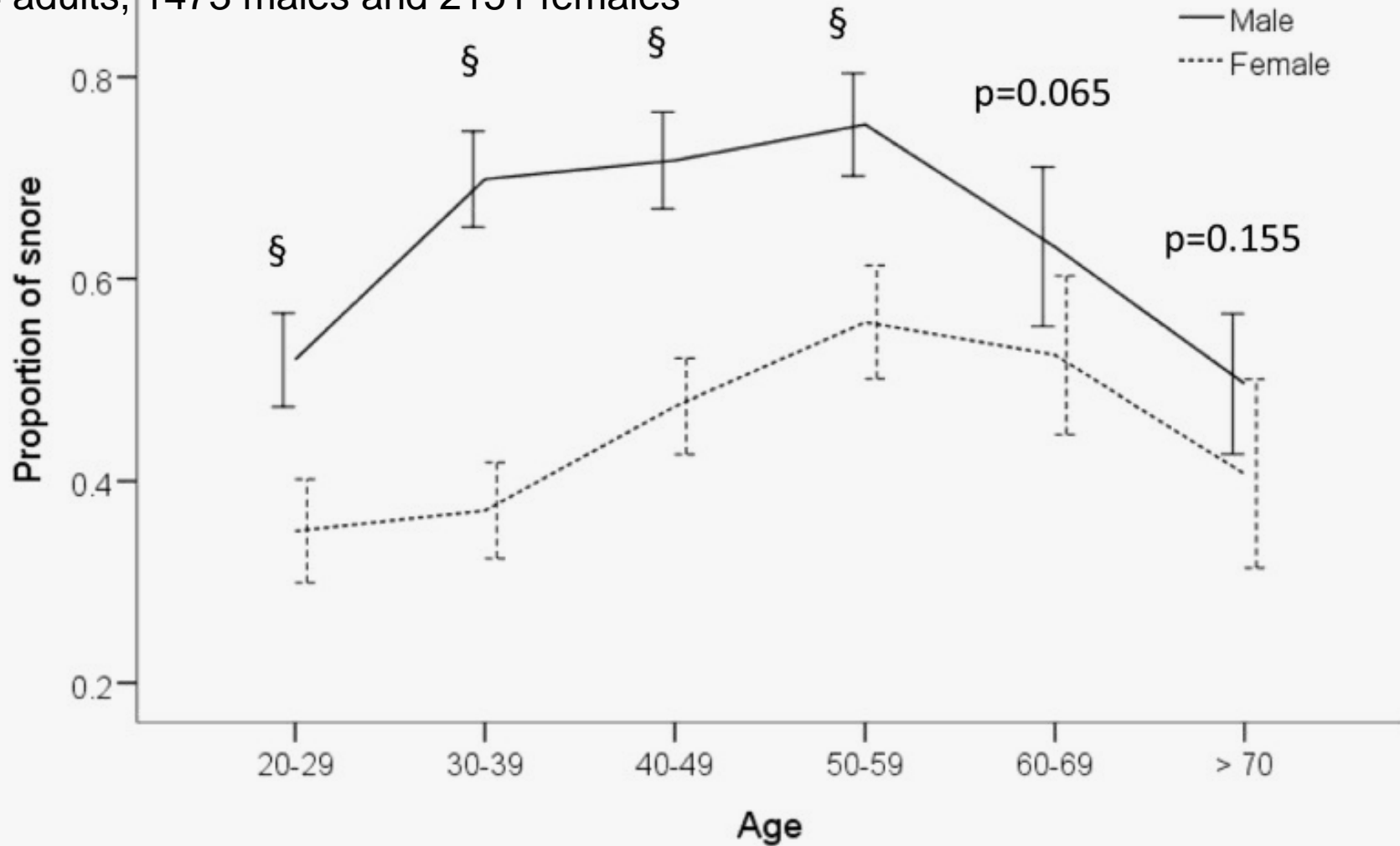
Larger pharynx but more collapsible

Smaller, stiffer

Less muscle tone in upper airway

Hormonal effect protects (but replacement doesn't always help)

3624 adults, 1473 males and 2151 females



§: $p < 0.0001$

The proportion of men and women remains statistically significant in each age group up to age 50 to 59 years

Chuang et al

Adverse health concerns

- DM (X2 commoner compared to nonsmokers)

- Hypertension

- Cardiovascular diseases

- Cerebrovascular diseases

- Osteoporosis/Low bone density

- With UARS – all daytime functioning issues –
sleepiness, psychomotor issues etc

Snoring and diabetes often increase during pregnancy, after the menopause and in women with Polycystic Ovary syndrome.

DM – Nurses' Health Study

69,852 women were included in the final analysis for the 1986–1996 follow-up period.

	No. of cases	Person-years of follow-up	Relative risk				
			Adjusted for age		Adjusted for age and body mass index		Multivariate adjusted†
			RR‡	95% CI‡	RR	95% CI	RR
No snoring	237	176,679	1.00§		1.00		1.00
Occasional snoring	1,297	428,686	2.12	1.85, 2.44	1.48	1.29, 1.70	1.41
Regular snoring	423	58,915	4.99	4.31, 5.96	2.25	1.91, 2.66	2.03
<i>p</i> for trend			<0.0001		<0.0001		<0.0001

Delaimy et al. Snoring as a Risk Factor for Type II Diabetes Mellitus: A Prospective Study. Am J Epidemiol (2002) 155 (5): 387-393.

Snoring and Cardiovascular Disease Risk

Table 2. Relative Risks (95% Confidence Intervals) of Coronary Heart Disease and Stroke According to Self-Reported Snoring at Baseline in 1986

	Frequency of Snoring		
	Never	Occasionally	Regularly
Total cardiovascular events (coronary heart disease + stroke)**			
# cases	162	729	151
Person-years	143,719	356,530	51,292
Age-adjusted	1.0	1.46 (1.23–1.74)	2.02 (1.62–2.53)
Multivariate	1.0	1.20 (1.01–1.43)	1.33 (1.06–1.67)
Fatal cardiovascular events			
# cases	31	156	30
Age-adjusted	1.0	1.61 (1.10–2.38)	2.07 (1.25–3.43)
Multivariate	1.0	1.33 (0.90–1.96)	1.35 (0.80–2.26)
Coronary heart disease			
# cases	102	441	101
Age-adjusted	1.0	1.43 (1.15–1.77)	2.18 (1.65–2.87)
Multivariate*	1.0	1.11 (0.89–1.39)	1.33 (1.00–1.77)
Total stroke			
# cases	60	288	50
Age-adjusted	1.0	1.60 (1.21–2.12)	1.88 (1.29–2.74)
Multivariate	1.0	1.42 (1.07–1.89)	1.35 (0.91–1.99)

Cardiovascular Risk estimate

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Association between sleep disordered breathing and incident coronary heart disease or heart failure stratified by sex in all participants (n = 1,280).

AHI	Overall			Women			Men			Interaction Significance
	HR	CI	P	HR	CI	P	HR	CI	P	
1. Categorical										
0	Ref			Ref			Ref			
> 0 to ≤ 5	1.5	(0.9, 2.5)	0.11	2.8	(0.98, 8.1)	0.054	1.1	(0.6, 1.9)	0.85	0.096
5 to ≤ 15	1.8	(1.0, 3.2)	0.044	4.6	(1.5, 14.6)	0.01	1.1	(0.5, 2.1)	0.85	0.035
15 to ≤ 30	1.2	(0.6, 2.5)	0.57	3.7	(0.8, 15.8)	0.08	0.8	(0.3, 1.7)	0.52	0.056
≥ 30	2.3	(1.1, 4.8)	0.02	3.8	(0.6, 23.7)	0.15	1.7	(0.8, 3.8)	0.17	0.21
2. Continuous	1.1	(0.98, 1.3)	0.10	1.4	(1.0, 1.9)	0.04	1.1	(0.9, 1.3)	0.49	0.21
3. Log ₂ AHI	1.1	(1.0, 1.2)	0.055	1.3	(1.0, 1.5)	0.018	1.1	(0.9, 1.2)	0.35	0.14

Overall F-test of all interaction terms P = 0.18

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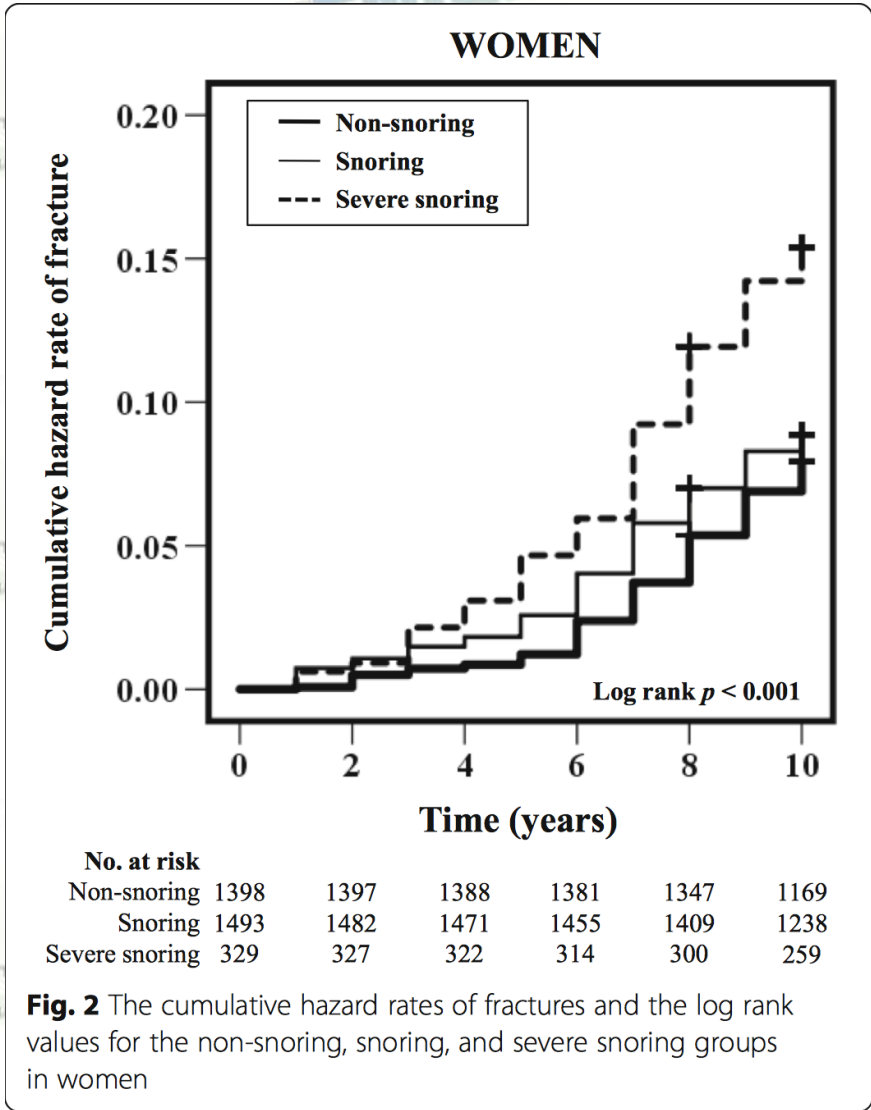
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Hla et al. Coronary heart disease incidence in sleep disordered breathing: the Wisconsin Sleep Cohort Study. SLEEP 2015;38(5):677–684.

Risk of fragility fractures



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Misra et al. Consensus Statement for Diagnosis of Obesity, Abdominal Obesity and the Metabolic Syndrome for Asian Indians and Recommendations for Physical Activity, Medical and Surgical Management. J Assoc Physicians India 2009.

Normal BMI: 18.0-22.9 kg/m²

Overweight: 23.0-24.9 kg/m²

Obesity: >25 kg/m²

Conclusions

- There is no unequivocal evidence for definite causal association between snoring and vascular diseases.
- Functional impairment including anxiety, depression commoner in women snorers.
- Snoring provides window of opportunity to look for metabolic syndrome/inv further.