Bodyweight Changes and the Incidence of Atrial Fibrillation in Individuals With Obstructive Sleep Apnea

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Background

Previous studies have demonstrated that obstructive sleep apnea (OSA) and obesity independently increase the risk for development of atrial fibrillation (AF). However, it is unknown whether weight changes in an OSA cohort also increase the risk of AF.

Objective

To explore an association between the development of atrial fibrillation and notable changes in bodyweight within a one-year period amongst adults with OSA .

Methods

Study Design: A case control study from a single tertiary institution.

Study Population: 182 patients with a confirmed OSA diagnosis from 2013-2020, 59 patients who developed AF and 123 without an AF diagnosis were included in the study.

Measurement: Patients' weight at the time of AF diagnosis by electrocardiogram was compared to the weight documented one year earlier. Weight at the time of the ECG closest to the sleep study date was compared to the weight one year prior for the control group.

Data Analysis: Multivariate logistic regression analysis to examine the association between AF cases (versus controls) and weight percent change greater than 5%.

Results

Table 1. Sample Characteristics by Atrial Fibrillation Diagnostic Status

	Total N=182		Atrial Fibrillation N=59		No Atrial Fibrillation N=123		
	N	%	N	%	N	%	p-value
Weight percent change (gain or loss) ≥ 5%							0.068
No	133	73.1	38	64.4	95	77.2	
Yes	49	26.9	21	35.6	28	22.8	
Sex							0.07
Female	76	41.8	19	32.2	57	46.3	
Male	106	58.2	40	67.8	66	53.7	
Race							0.03
African American	86	47.3	19	32.2	67	54.5	
White	71	39.0	30	50.8	41	33.3	
Asian	10	5.5	3	5.1	7	5.7	
Other or declined	15	8.2	7	11.9	8	6.5	
Smoking history							0.47
No	101	55.5	35	59.3	66	53.7	
Yes	81	44.5	24	40.7	57	46.3	
Chronic Obstructive Pulmonary Disease (COPD)							0.13
No	158	86.8	48	81.4	110	89.4	
Yes	24	13.2	11	18.6	13	10.6	
Hypertension (HTN)							0.036
No	49	26.9	10	16.9	39	31.7	
Yes	133	73.1	49	83.1	84	68.3	
Diabetes mellitus (DM)							0.73
No	114	62.6	38	64.4	76	61.8	
Yes	68	37.4	21	35.6	47	38.2	
Coronary artery disease (CAD)							0.012
No	163	89.6	48	81.4	115	93.5	
Yes	19	10.4	11	18.6	8	6.5	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**p-value**
Weight difference score	-1.3	11.7	-2.5	11.8	-0.76	11.6	0.19
Weight percent change	-.478	5.11	-0.986	5.38	-0.235	4.97	0.35
Age	62.8	9.8	67.7	10.2	60.5	8.7	< 0.001

Table 2. Adjusted Odds Ratios for Atrial Fibrillation Diagnostic Status

	Adjusted OR (95% CI)	p-value
Constant	0.00086 (0.00 - 0.015)	< 0.001
Weight gain or loss ≥ 5%	2.27 (1.014 - 5.089)	0.04
Age	1.08 (1.035 - 1.125)	< 0.001
Gender:		
Female	1.00	
Male	1.61 (0.685 - 3.762)	0.28
Race:		
African American	1.00	
White	1.83 (0.744 - 4.479)	0.19
Other/declined	2.18 (0.720 - 6.605)	0.17
Smoking history	0.55 (0.247 - 1.201)	0.13
COPD	2.10 (0.709 - 6.229)	0.18
HTN	2.29 (0.864 - 6.07)	0.10
DM	0.76 (0.345 - 1.696)	0.51
CAD	1.69 (0.542 - 5.266)	0.37
HF	2.91 (0.916 - 9.230)	0.070

OR: Odds Ratio; CI: Confidence Interval

- The incidence of AF was 32.4%, the median weight change was -1.32± 11.69 lb.
- 36% of those diagnosed with AF had weight changes (gain or loss) ≥5% compared to 23% (p= 0.07).
- The average weight change for those with AF compared to those without AF was -2.5 ±11.8 lb. vs. -0.76 ± 11.6 lb. (p=0.19).
- The change in the adjusted odds among those with ≥5% weight gain or loss with an AF diagnosis was 2.27 (95% CI =1.01- 5.09, p=0.04).

Conclusion

Among individuals with OSA, those who exhibited weight changes greater than 5% over a one-year period have increased odds for developing AF. Further large-scale studies need to be undertaken to understand the link between intentional versus unintentional weight loss.

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