Clinical, Demographic, Functional, and Symptom Correlates of COMISA in Stable Heart Failure

K. A. LaFleur[1], MPH, MS, APRN, FNP-BC; S.Jeon[2], PhD; S. Conley[3], PhD, RN; Z. Wang[1], PhD, RN; N. S. Redeker[1], PhD, RN, FAHA, FAAN

1 University of Connecticut; 2 Yale University; 3 Mayo Clinic

Background

- Sleep disordered breathing (SDB), including obstructive (OSA) & central sleep apnea and insomnia are common in heart failure (HF)
- Comorbid OSA and insomnia (COMISA) may together contribute to poor outcomes

Purpose/Aims

- Describe the prevalence of COMISA among adults with stable chronic HF
- Compare clinical and demographic characteristics between groups with COMISA, insomnia, OSA, and normal sleep
- Examine the risk of COMISA in the presence of insomnia, OSA, and clinical and demographic characteristics

Methods

Secondary analysis of observational study of sleep among adults with stable HF (1,2)

Sample: Adults w stable chronic HF recruited from HF disease management centers
No previously identified sleep disorders

Variables and Measures

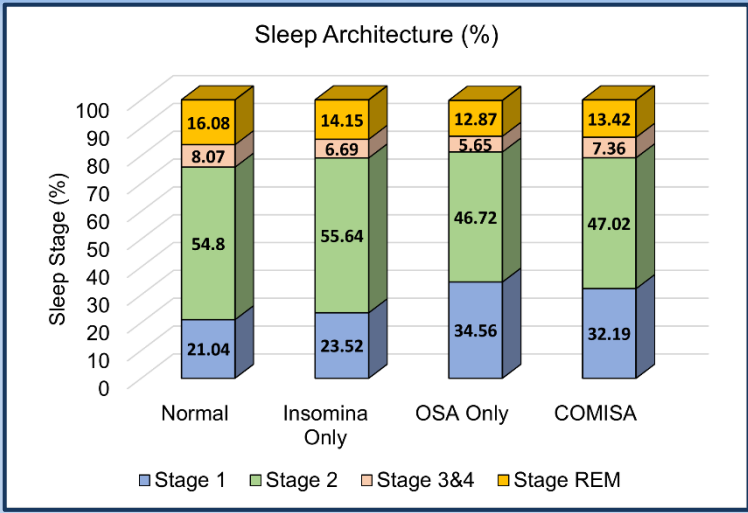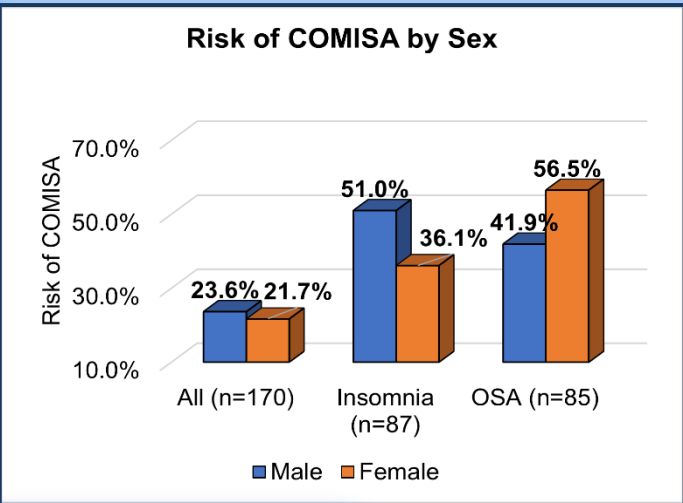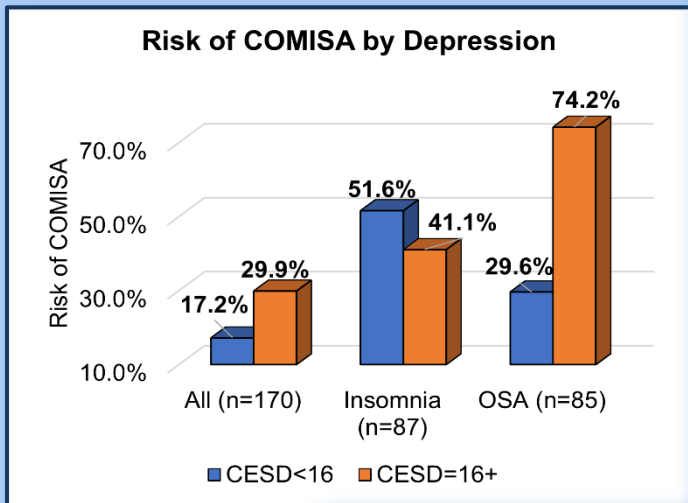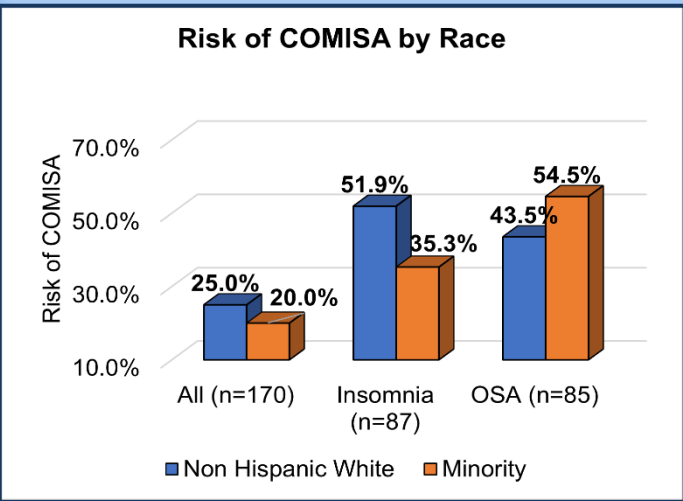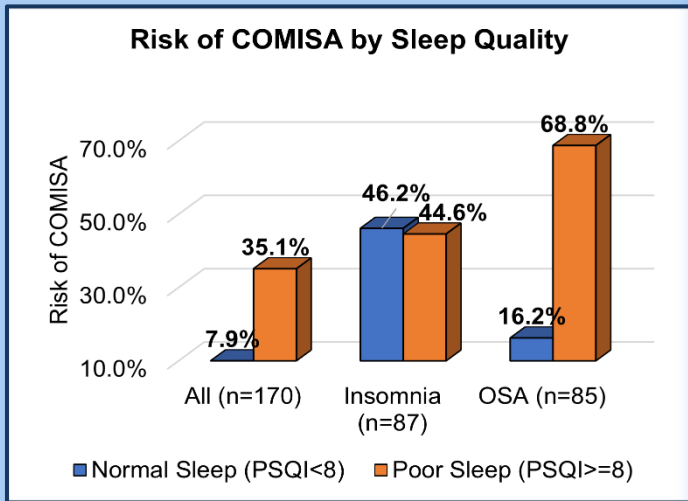|	
Apnea Hypopnea index Sleep Stages Arousal Index % Time> 90%	Polysomnography (one night at home)
Insomnia	Difficulty initiating or maintaining sleep or waking too early in the morning (score = 1-3)
COMISA	AHI $\geq$ 15 + DIMS
Sleep Quality	Pittsburgh Sleep Quality Index
Depressive Symptoms	Center for the Epidemiological studies Scale (CESD)
Sleepiness	Epworth Sleepiness Scale
Physical Function	SF-36 Physical Function
Emotional Function	SF-36 Emotional Function
Six-Minute Walk	Six-minute walk distance (ft)

Results

Sample: 170 stable adults with chronic heart failure [M age = 60.3 ± 16.8 years; n = 60 (35%) female; n = 50 (29%) African American; 10 other minority: LVEF M = 32 ± 14.6]

Comparison of Normal, Insomnia, OSA Only, and COMISA

Variable		Normal (N=37) N (%)	Insomnia (N=48) N (%)	OSA only (n=46) N (%)	COMISA (n=39) N (%)	P value
Age	Age<60	19 (24.4%)	26 (33.3%)	15 (19.2%)	18 (23.1%)	.1691
	Age=60+	18 (19.6%)	22 (23.9%)	31 (33.7%)	21 (22.8%)	
Race	Non-H White	21 (19.4%)	25 (23.2%)	35 (32.4%)	27 (25.0%)	.0597
	Minority	16 (26.7%)	22 (36.7%)	10 (16.7%)	12 (20.0%)	
Sex	Male	23 (20.9%)	25 (22.7%)	36 (32.7%)	26 (23.6%)	.0652
	Female	14 (23.3%)	23 (38.3%)	10 (16.7%)	13 (21.7%)	
LVEF	45+	9 (25.7%)	8 (22.9%)	11 (31.4%)	7 (20.0%)	.7174
	<45	26 (20.3%)	37 (28.9%)	33 (25.8%)	32 (25.0%)	
BMI	Normal	17 (37.0%)	11 (23.9%)	10 (21.7%)	8 (17.4%)	.0128
	Overweight	8 (20.0%)	16 (40.0%)	11 (27.5%)	5 (12.5%)	
	Obese	11 (13.6%)	20 (24.7%)	24 (29.6%)	26 (32.1%)	
NYHA	NYHA I/II	26 (26.3%)	22 (22.2%)	26 (26.3%)	25 (25.3%)	.1193
	NYHA III/IV	11 (15.5%)	26 (36.6%)	20 (28.2%)	14 (19.7%)	
Diabetes	Yes	4 (8.0%)	15 (13.0%)	17 (34.0%)	14 (28.0%)	.0403
	No	33 (27.5%)	33 (27.5%)	29 (24.2%)	25 (20.8%)	
Sleep Quality	PSQI>=8	5 (5.3%)	41 (43.6%)	15 (18.0%)	33 (35.1%)	,0001
	PSQI<8	32 (42.1%)	7 (9.2%)	31 (40.8%)	6 (7.9%)	.
Sleepiness	ESS 10+	7 (11.7%)	20 (33.3%)	16 (26.7%)	17 (28.3%)	.1900
	ESS < 10	30 (27.3%)	28 (25.5%)	30 (27.3%)	22 (20.0%)	
Depression	CESD = 16+	13 (16.9%)	33 (42.9%)	8 (10.4%)	23 (29.9%)	.0001
	CESD <16	24 (25.8%)	15 (16.1%)	38 (40.9%)	16 (17.2%)	

Variable	Normal (N=37) M (SD)	Insomnia (N=48) M (SD)	OSA only (n=46) M (SD)	COMISA (n=39) M (SD	P value
Charlson	2.0 (1.6)	2.6 (1.6)	2.6 (1.6)	2.6 (1.4)	.2779
SF36 Physical Function	27.5 (1.7)	25.9 (1.2)	26.5 (1.6)	26.1 (1.5)	<.0001
Mental Health	18.2 (1.9)	17.1 (2.0)	18.8 (1.5)	17.9 (2.0)	.0003
Six Minute Walk (ft)	1116 (444)	865 (429)	1030 (454)	939 (390)	.0634
Depression (CESD)	13.5 (9.1)	23.0 (11.2)	11.9 (7.0)	19.0 (12.8)	<.0001
Fatigue Severity (GFI)	4.2 (2.5)	6.3 (2.5)	4.8 (2.1)	5.9 (2.7)	.0002
Apnea Hypopnea Index	7.5 (4.10)	7.6 (4.3)	37.7(19.5)	34.1(15.5)	<.0001
Time at 02 sat < 90%	8.2 (16.7)	6.3 (16.6)	16.1 (21.1)	16.8 (18.2)	.0129
Arousal Index	15.8 (5.7)	18.2 (8.4)	27.4 (12.0)	24.7 (12.8)	<.0001
Total Sleep Time (min)	345 (87)	316 (100)	339 (82)	291 (109)	.0483
Sleep Efficiency (PSQI)	76.0 (13.3)	70.2 (16.1)	71.8 (13.9)	65.8 (20.5)	.0561

1. Redeker et al., Sleep 2010 Vol. 33 Issue 4 pp 551-60
2. Redeker et al., Sleep 2010 Vol. 33 Issue 9 pp 1210-6

Risk of COMISA by Sleep Quality

Risk of COMISA by Race

Risk of COMISA by Depression

Risk of COMISA by Sex

Sleep Architecture (%)

Summary

- 23% had COMISA which was equally present in men and women and associated with the shortest sleep time and poorest sleep efficiency
- In people with insomnia, Non-Hispanic White (OR=1.98) and Male (OR=1.84) had greater risk of COMISA
- In people with OSA, Minority (OR=1.56), Female (OR=1.80), Poor Sleep (OR=11.37), and Depression (OR=6.83) had greater risk of COMISA
- 74% of adults with OSA who were depressed had COMISA, compared with 41% of those with insomnia who were depressed

Conclusions & Implications

- Future study is needed to better understand COMISA and its correlates and outcomes among adults with chronic HF