



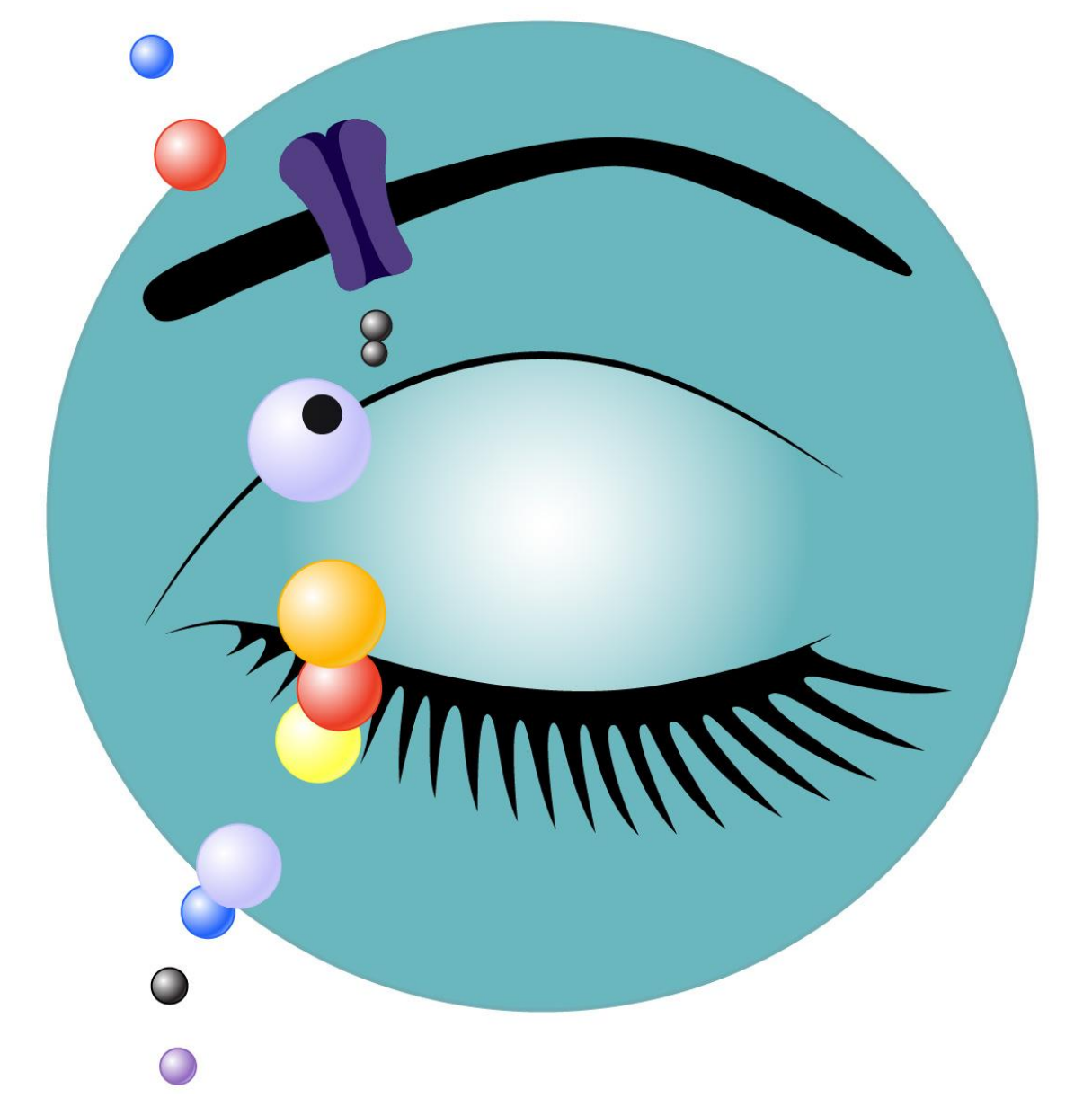
Prevalence of Obstructive Sleep Apnea in Collegiate Football Players at Colorado State University

S. Raj J. Trikha¹, Rich Raab², Matthew Ayala¹, Justin Brake¹, Vincent Ly¹, Steven Moore³, Mark Neagle³, Mark Petrun³, Josiane L. Broussard¹

¹Sleep and Metabolism Laboratory, Department of Health and Exercise Science, Colorado State University, Fort Collins, CO, USA

²The Center for Dental Sleep Medicine, Fort Collins, CO, USA

³University of Colorado Health, Pulmonology Clinic, Fort Collins, CO, USA



Introduction

It is estimated that more than 54 million Americans between the ages of 30-69 have some level of obstructive sleep apnea (OSA)¹. OSA increases the risk for several cardiometabolic diseases, depression, and reduced quality of life. Risk factors for OSA include high body mass index (BMI), large neck size, narrowed airway, and male sex. Indeed, results from previous studies demonstrate higher prevalence of OSA and other sleep disorders in professional football players (50% of football players vs. 25% in the general population), as they present with many risk factors for OSA. These risk factors are also present in collegiate football players; however, the proportion of younger athletes affected by OSA is unknown. ***In the current study, we tested the hypothesis that a higher prevalence of OSA already exists in collegiate football players compared to the general population.***

Methods

- Participants were recruited from the Colorado State University (CSU) football team in fall of 2019
- Anatomical evaluations were conducted to assess neck circumference and unique upper airway features
- Participants also completed in-depth healthy history and sleep questionnaires
- WatchPat 300 device was used for in-home estimations of Apnea Hypopnea Index (AHI), blood oxygen saturation, and body position for 3 consecutive nights
- WatchPat data were autoscored and evaluated by 2 board certified sleep physicians

Participant Characteristics

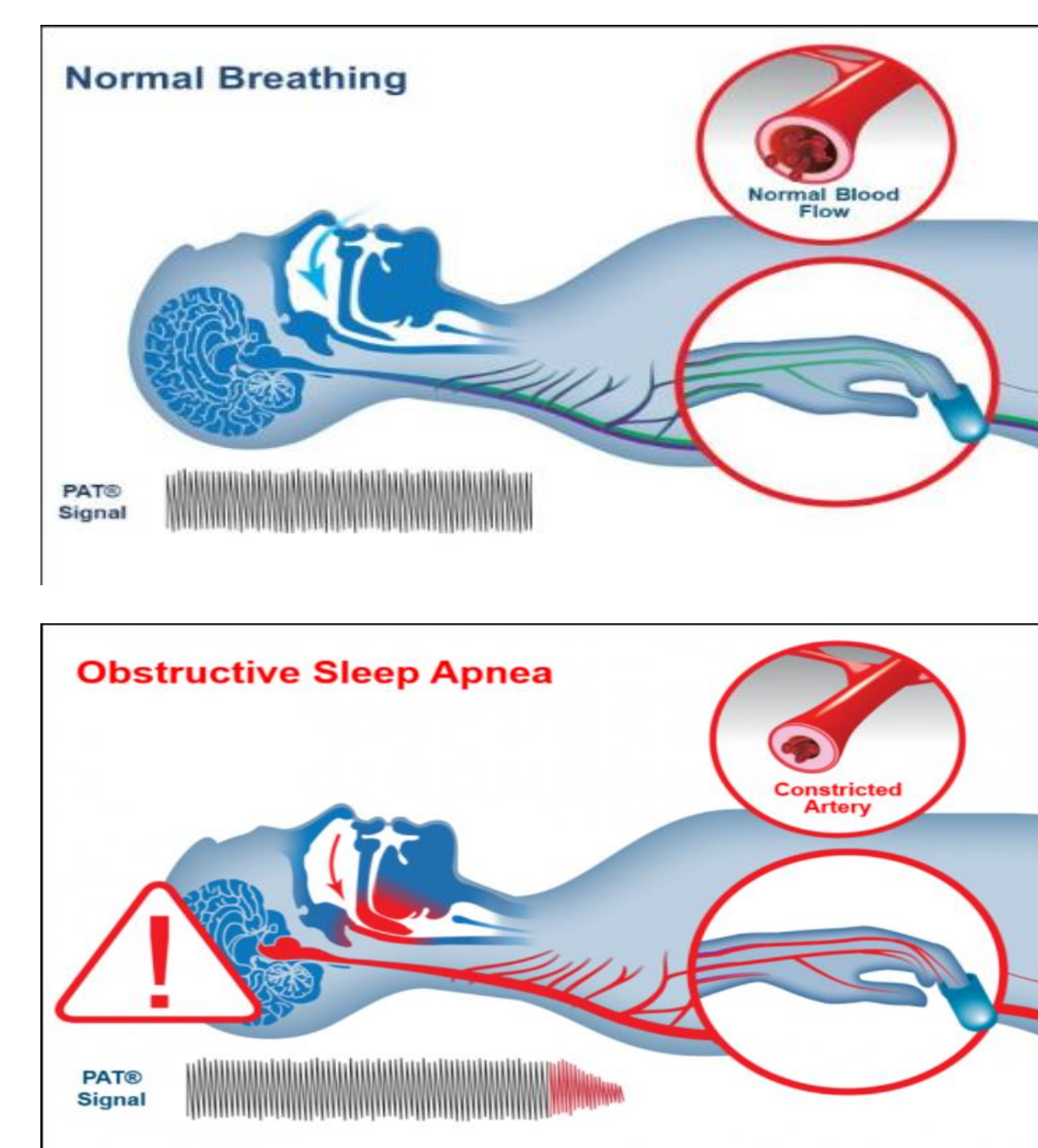


Figure 1. Contrast between normal breathing and obstructive sleep apnea

OSA pAHI Scale:

- Mild: 5-15
- Moderate: 16-30
- Severe: >30

WatchPat 300:

- Oximetry
- Body position
- Heart rate
- PAT signal
- Actigraphy
- Snoring



Figure 2. WatchPat 300

Primary Findings

Table 1. Participant Characteristics.

	All Players	No Sleep Apnea	Mild Sleep Apnea	Moderate Sleep Apnea	p-value
n	85	38	17	3	
Height (cm)	183.9 ± 6.0	183.9 ± 6.0	183.4 ± 6.8	184.6 ± 6.4	0.95
Weight (kg)	100.2 ± 19.2	100.2 ± 19.2	104.3 ± 21.7	111.8 ± 33.6	0.17
BMI (kg/m ²)	29.4 ± 4.4	29.4 ± 4.4	30.7 ± 4.8	32.5 ± 7.7	0.05
Neck Circumference (cm)	42.5 ± 3.1	42.5 ± 3.1	42.1 ± 2.7	46.1 ± 1.8	0.07
Total Weekday Sleep (h)	7.29 ± 1.5	7.4 ± 1.8	7.2 ± 1.4	7.2 ± 1.0	0.95
Total Weekend Sleep (h)	8.75 ± 1.6	8.7 ± 1.5	8.4 ± 1.7	8.0 ± 1.0	0.61
AHI	5.1 ± 4.1	2.7 ± 1.3	8.4 ± 2.6	16.7 ± 1.2	<0.0001

Data are mean ± SD. One-way ANOVA between No Sleep Apnea, Mild Sleep Apnea, and Moderate Sleep Apnea.

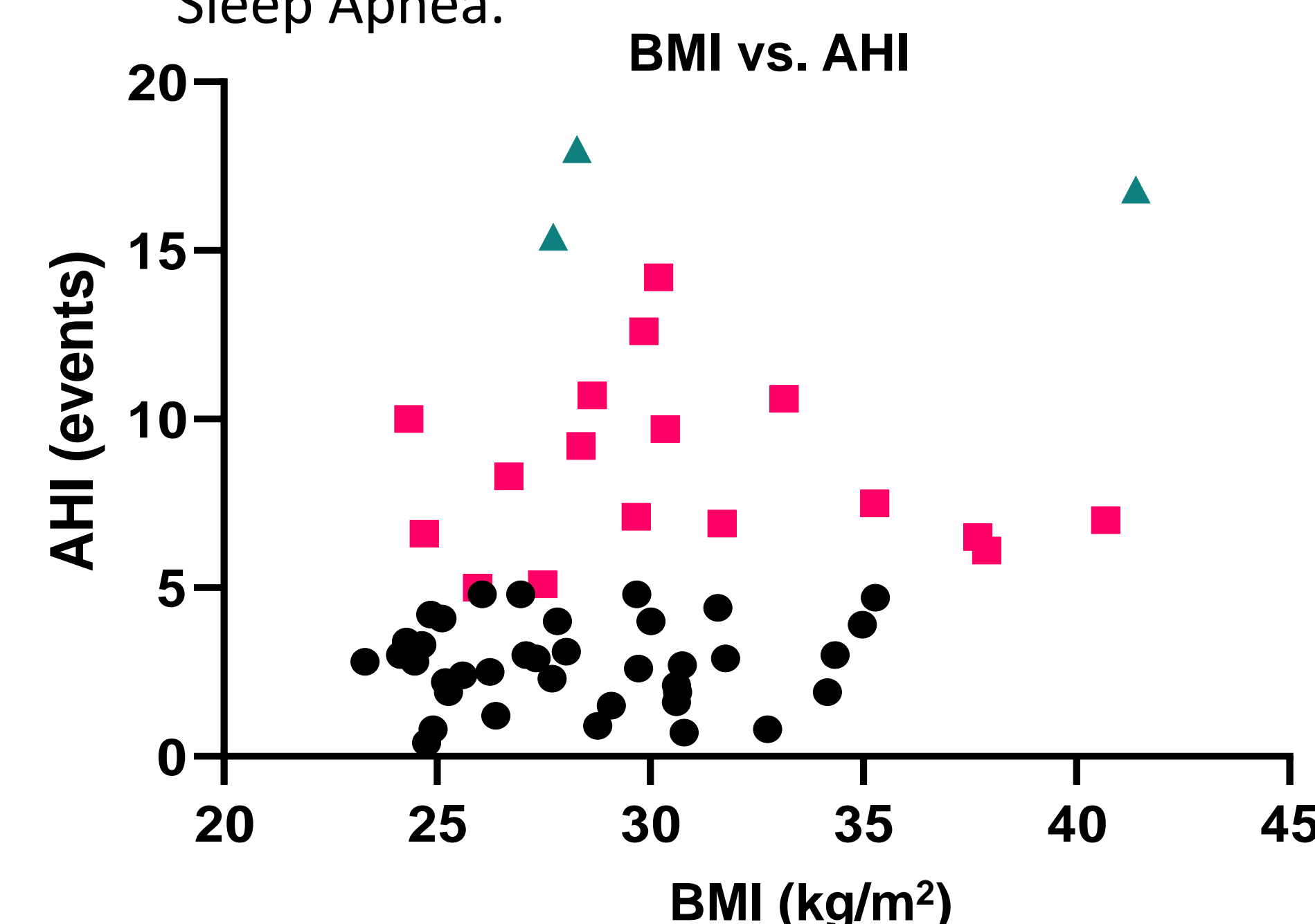


Figure 3. Apnea-Hypopnea index versus body mass index.

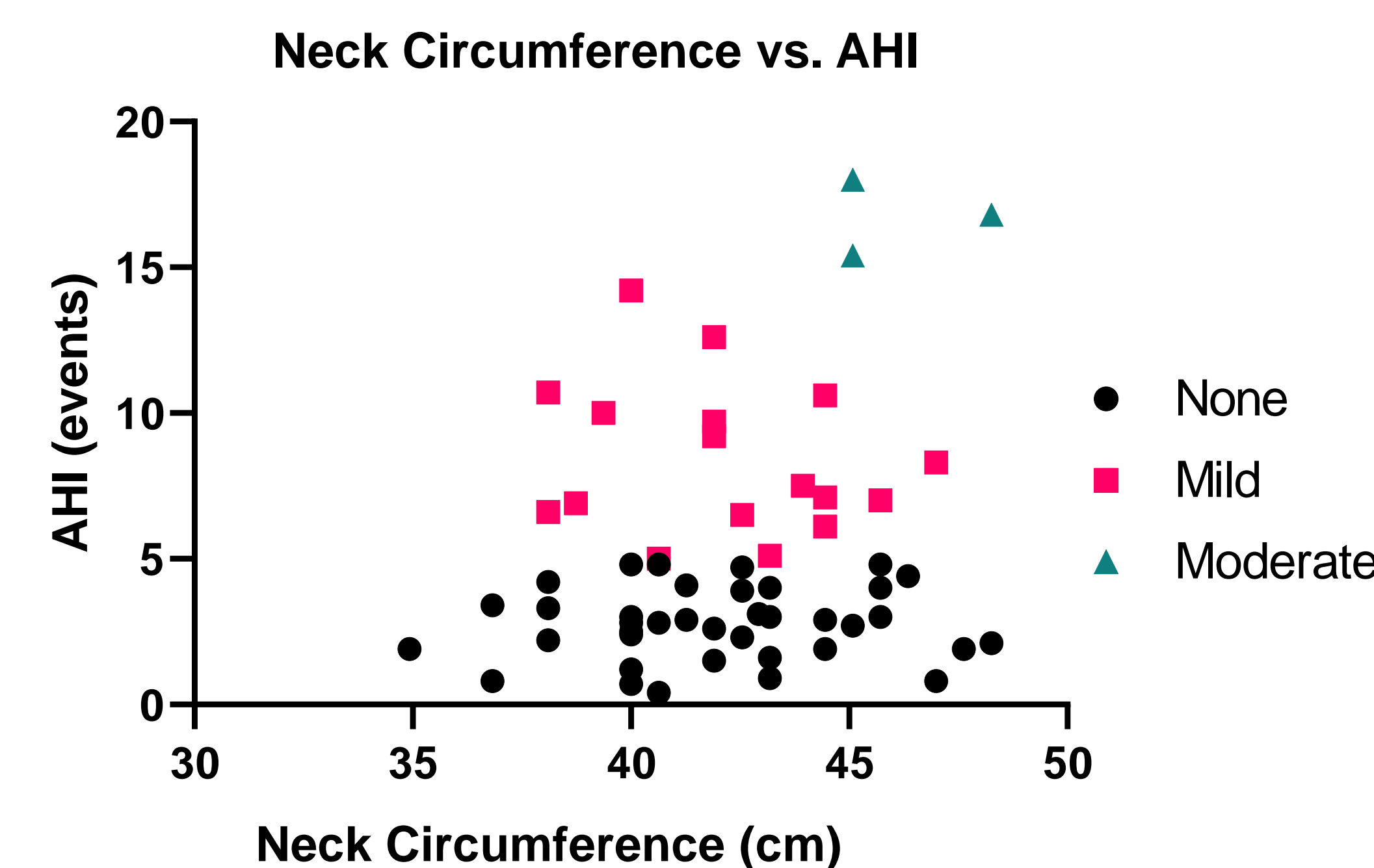


Figure 4. Apnea-Hypopnea index versus neck circumference.

Summary of Findings

- Mild OSA is present in 29% of CSU collegiate football players
- Moderate OSA is present in 5% of CSU collegiate football players
- BMI and neck circumference may be potential risk factors for OSA in this population
- No differences were seen between total weekday or weekend sleep between OSA groups
- In contrast, longer weekend sleep duration suggests weekday insufficient sleep

Conclusions

Collegiate football players at CSU present with OSA at a higher rate than non-athletes, but lower than NFL players. It is unknown whether the presence of OSA in younger individuals is associated with elevated risk for development of cardiovascular disease and type 2 diabetes later in life.

References

- Benjafield, Adam V., et al. "Estimation of the global prevalence and burden of obstructive sleep apnoea: a literature-based analysis." *The Lancet Respiratory Medicine* 7.8 (2019): 687-698.