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FIRST RESPIRATORY EVENT LATENCY DURING SLEEP AS A PREDICTOR OF AROUSAL INDEX VALUE

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INTRODUCTION

Arousals or awakenings indicate a transient intrusion of wakefulness into sleep, spontaneous or induced, and are usually evaluated through arousal index (AI = number of awakenings per hour), as indicator of sleep fragmentation and directly related to sleep quality. It is suspected that the early appearance of respiratory events during sleep can affect nocturnal sleep continuity. The objective of this study is to estimate the association between the latency of the first respiratory event (apnea/hypopnea, LFRE) and arousal index as an indirect marker of sleep instability. It has been observed that LFRE is lower in obese subjects.

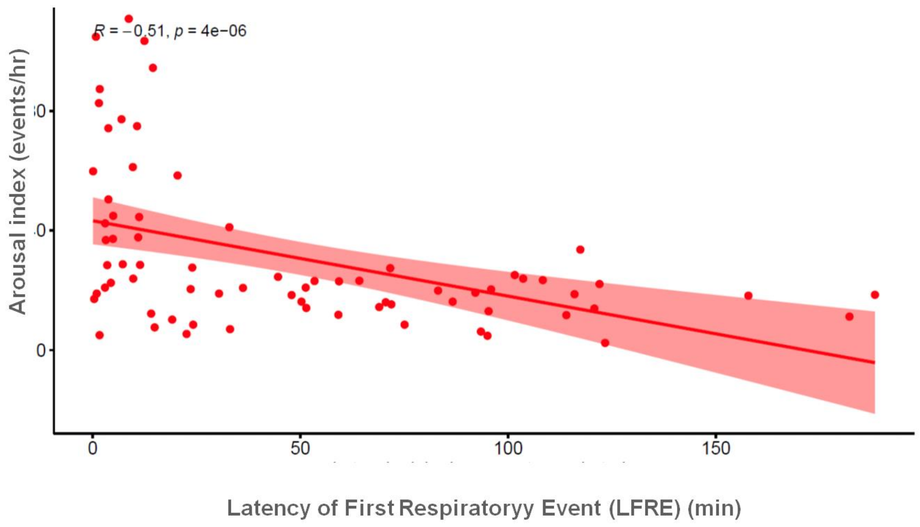
METHODS

An observational study was conducted based on clinical and polysomnographic data in 72 subjects older than 18 yo (41 M, 31 F) with suspected OSA. The dependent variable was AI and the main predictor was LFRE (time from sleep onset until the first apnea or hypopnea). Spearman correlation models were used to evaluate the relationship between the main variables. In addition, multivariate analyses were performed using quantile regression models adjusted for age, sex, body mass index, vascular risk factors, type of sleep, and position in which the respiratory event occurred. A stratified analysis by sex was also performed to assess potential effect modification of this variable. The statistical significance level considered was a p-value <0.05, and all analyses were performed using the statistical software R 3.5.2 (R Core Team, 2023).

RESULTS

Median latency values of LFRE and AI were 31.7 (IQR = 75.7) minutes and 21.5 (IQR = 22.5) awakenings/hour, respectively. Men had lower LFRE than women (17 [IQR = 69.4] awakenings/hour vs. 47.4 [IQR = 74.4] awakenings/hour). An inverse correlation was observed between LFRE and AI value (Spearman's rho = -0.51; p-value <0.001). In multivariate quantile modeling (percentile 50), a reduction in AI was observed as LFRE increased (coefficient = -0.145; p-value = 0.027; 95% CI: -0.23; -0.042). The interaction/stratified analysis by sex did not show significant differences (interaction p-value = 0.36).

Correlation LFRE – AROUSAL INDEX



MULTIVATE REGRESSION ANALYSIS

	Value	Std Error	T value	Pr(>|t|)
(Intercept)	17.11046	28.94510	0.59113	0.55651
latency	-0.14532	0.06434	-2.25874	0.02732
age	-0.01048	0.29853	-0.03511	0.97210
gender	12.93668	12.93668	5.84543	0.03046
BMI	0.36974	0.58057	0.63685	0.52649
CV RF	3.92578	3.92578	8.18020	0.63293
position	-0.58335	-0.58335	6.91780	0.93306
sleep	-4.10199	10.77853	-0.38057	0.70478

Call: rq(formula = ai ~ latencia + edad + sexof + imc_all + frcvf +posicion + sueño, data = early)

CONCLUSIONS

In our sample, an increase in LFRE was associated with lower AI values. Although these results may indicate that LFRE is a predictor of sleep disruption measured as an increased AI, it is essential to conduct multicenter studies, preferably longitudinal studies, that include a larger sample size (including pediatric population, independently analyzed) to confirm this relationship.

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