

Obstructive Sleep Apnea in Acute Myocardial Infarction: A Prognostic Risk Factor beyond Traditional Players?

Carlos Wollmann,¹ Luciano F. Drager²

Faculdade de Medicina, Universidade de São Paulo,¹ Bauru, SP - Brazil

Unidades de Hipertensão, Instituto do Coração (InCor) e Disciplina de Nefrologia, Universidade de São Paulo,² São Paulo, SP - Brazil

Editorial referring to the article: *Associated Factors to the Risk of Obstructive Sleep Apnea in the Acute Phase of Myocardial Infarction*

The high prevalence of obstructive sleep apnea (OSA) and its worrisome association with various cardiovascular diseases, particularly ischemic heart disease, demand our attention.¹ This common sleep disordered breathing, characterized by partial or complete upper airway obstructions during sleep, profoundly impacts overall health.^{1,2} In the cardiovascular context, intermittent hypoxia, sleep fragmentation, and intrathoracic pressure swings promoted by repeated respiratory events during sleep promote several potentially deleterious phenomena, including increased sympathetic activity, blood pressure fluctuations, chronic systemic inflammation, reactive oxygen species production, and endothelial dysfunction.¹⁻³ These factors create a fertile ground for the development and progression of atherosclerosis,^{4,5} significantly increasing the likelihood of ischemic events if the condition remains undetected and untreated.^{6,7} However, the relationship between OSA and acute myocardial infarction (AMI) is complex.⁸ Patients with OSA often share risk factors that also increase AMI risk, notably age, male sex, and obesity. While some evidence suggests an independent role for OSA in the cardiovascular risk,⁶ its contribution remains controversial in high-risk patients with multiple comorbidities.⁸ Further research in this area is therefore warranted in order to provide additional insights.

In this issue of the *International Journal of Cardiovascular Sciences*, Carrijo et al. explore the complex relationship between OSA and traditional risk factors in 145 patients with ST-segment elevation myocardial infarction (STEMI).⁹ The authors used the widely used STOP-BANG questionnaire to assess OSA risk. The initial results were consistent with previous literature: a high frequency (58.6%) of patients exhibited a high risk for OSA. This highlights the urgent need for increased attention to this comorbidity, particularly in this specific patient population.¹⁰ In the multivariate analysis, the authors found an independent association of OSA with both male sex and hypertension in these patients. The presence of hypertension in OSA

patients is not coincidental. Some of the aforementioned mechanisms associated with OSA directly contribute to elevated blood pressure, thereby increasing cardiovascular risk.^{2,3}

While studies addressing OSA in the cardiovascular context are welcome, some aspects of the study warrant careful interpretation: 1) the study highlights the utility of screening tools such as the STOP-BANG questionnaire for identifying patients with a higher probability of OSA.¹¹ Despite being simple and easily applicable, several questionnaires (including the STOP-BANG) lack appropriate sensitivity and specificity in detecting OSA. In addition, questionnaires are not able to characterize OSA severity. Instead, full polysomnography (the gold standard for OSA diagnosis)^{1,2} or even portable monitoring devices would provide more comprehensive information on OSA severity, including the analysis of metrics of nocturnal hypoxia, a key factor in cardiovascular risk;¹⁰ 2) Although the authors found independent associations of OSA with male sex and hypertension, the limited sample size precluded exploration of whether OSA independently worsens the prognosis in these AMI patients or whether the cardiovascular risk attributable to OSA is partially mediated by sex and comorbidities such as hypertension. Two recent studies from the same group addressed this issue.^{12,13} In the first, Wang and colleagues analyzed the relationship between OSA severity (assessed by the apnea-hypopnea index, AHI) and adverse cardiovascular events (AMI, stroke, and cardiovascular death) in a prospective cohort of patients with acute coronary syndrome (ACS).¹² The main results demonstrated an association between higher AHI and adverse cardiovascular events in both men and women with ACS. In the second study,¹³ the same authors investigated the association between OSA (also measured by AHI) and major long-term cardiovascular events (stroke, non-fatal AMI, and cardiovascular death) in ACS patients with and without hypertension. The main results indicated an independent association between higher AHI and increased risk of major cardiovascular events, irrespective of hypertension status.¹³ These studies shed light on the potential role of OSA in the context of ACS.

In conclusion, the high frequency of increased OSA risk in AMI patients reinforces the existing literature and highlights the growing need to raise suspicion for this important sleep disorder in high-risk cardiovascular patients. The significant impact of this comorbidity on clinical outcomes underscores the urgent need for research focused on optimizing practical early diagnosis and developing effective therapeutic strategies for this patient population.

Keywords

Sleep; Myocardial Infarction; Prognosis; Risk Factors; Obstructive Sleep Apnea.

Mailing Address: Luciano F. Drager •

Universidade de São Paulo. Av., Enéas de Carvalho Aguiar, 44, 2º andar, bloco 2, sala 8. Postal code: 05403-900. São Paulo, SP – Brazil
E-mail: luciano.drager@incor.usp.br

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References

1. Drager LF, Lorenzi-Filho G, Cintra FD, Pedrosa RP, Bittencourt LRA, Poyares D, et al. 1º Posicionamento Brasileiro sobre o Impacto dos Distúrbios de Sono nas Doenças Cardiovasculares da Sociedade Brasileira de Cardiologia. *Arq Bras Cardiol.* 2018;111(2):290-340. doi: 10.5935/abc.20180154.
2. Gottlieb DJ, Punjabi NM. Diagnosis and Management of Obstructive Sleep Apnea: A Review. *JAMA.* 2020;323(14):1389-400. doi: 10.1001/jama.2020.3514.
3. Drager LF, Togeiro SM, Polotsky VY, Lorenzi-Filho G. Obstructive Sleep Apnea: A Cardiometabolic Risk in Obesity and the Metabolic Syndrome. *J Am Coll Cardiol.* 2013;62(7):569-76. doi: 10.1016/j.jacc.2013.05.045.
4. Souza SP, Santos RB, Santos IS, Parise BK, Giatti S, Aiello AN, et al. Obstructive Sleep Apnea, Sleep Duration, and Associated Mediators with Carotid Intima-Media Thickness: The ELSA-Brasil Study. *Arterioscler Thromb Vasc Biol.* 2021;41(4):1549-57. doi: 10.1161/ATVBAHA.120.315644.
5. Miranda ÉJFP, Mazzotti DR, Santos RB, Souza SP, Parise BK, Giatti S, et al. Incident Coronary Calcium Score in Patients with OSA with and without Excessive Sleepiness: Brazilian Longitudinal Study of Adult Health. *Chest.* 2024;165(1):202-12. doi: 10.1016/j.chest.2023.06.025.
6. Lee CH, Sethi R, Li R, Ho HH, Hein T, Jim MH, et al. Obstructive Sleep Apnea and Cardiovascular Events after Percutaneous Coronary Intervention. *Circulation.* 2016;133(21):2008-17. doi: 10.1161/CIRCULATIONAHA.115.019392.
7. Marin JM, Carrizo SJ, Vicente E, Agustí AG. Long-Term Cardiovascular Outcomes in Men with Obstructive Sleep Apnoea-Hypopnoea with or without Treatment with Continuous Positive Airway Pressure: An Observational Study. *Lancet.* 2005;365(9464):1046-53. doi: 10.1016/S0140-6736(05)71141-7.
8. McEvoy RD, Antic NA, Heeley E, Luo Y, Ou Q, Zhang X, et al. CPAP for Prevention of Cardiovascular Events in Obstructive Sleep Apnea. *N Engl J Med.* 2016;375(10):919-31. doi: 10.1056/NEJMoa1606599.
9. Carrijo LSS, Magnabosco P, Raponi MBG, Oliveira MAM, Araújo SA, Martins LC, et al. Associated Factors to the Risk of Obstructive Sleep Apnea in the Acute Phase of Myocardial Infarction. *Int J Cardiovasc Sci.* 2025;38:e20240008.
10. Yeghiazarians Y, Jneid H, Tietjens JR, Redline S, Brown DL, El-Sherif N, et al. Obstructive Sleep Apnea and Cardiovascular Disease: A Scientific Statement from the American Heart Association. *Circulation.* 2021;144(3):e56-e67. doi: 10.1161/CIR.0000000000000988.
11. Fonseca LB, Silveira EA, Lima NM, Rabahi MF. STOP-Bang Questionnaire: Translation to Portuguese and Cross-Cultural Adaptation for Use in Brazil. *J Bras Pneumol.* 2016;42(4):266-72. doi: 10.1590/S1806-37562015000000243.
12. Wang X, Fan J, Guo R, Hao W, Gong W, Yan Y, et al. Association of Obstructive Sleep Apnoea with Cardiovascular Events in Women and Men with Acute Coronary Syndrome. *Eur Respir J.* 2023;61(1):2201110. doi: 10.1183/13993003.01110-2022.
13. Wang G, Miao H, Hao W, Zhao G, Yan Y, Gong W, et al. Association of Obstructive Sleep Apnoea with Long-Term Cardiovascular Events in Patients with Acute Coronary Syndrome with or without Hypertension: Insight from the OSA-ACS Project. *BMJ Open Respir Res.* 2023;10(1):e001662. doi: 10.1136/bmjresp-2023-001662.

