ARCHIVES OF THE
TURKISH SOCIETY
OF CARDIOLOGY

Official journal of the
TURKISH
SOCIETY OF
CARDIOLOGY

Correct Interpretation of Exaggerated Blood Pressure Response During Exercise Tests

Egzersiz Testleri Sırasında Abartılı Kan Basıncı Yanıtının Doğru Yorumlanması

LETTER TO THE EDITOR
EDİTÖRE MEKTUP

To the Editor,

I read with great interest the article titled "Different Cardio-selective ß-blockers and the Prevention of Exaggerated Blood Pressure Response During Exercise: A Retrospective Cross-sectional Study" by Mert et al.[1] This analysis evaluated the blood pressure response during exercise tests in 2,803 patients and observed that the exaggerated blood pressure response (eBPR) during the exercise test was blunted in patients using ß-blockers (1,258 patients). No statistical difference was found in the comparison of five different cardioselective ß-blockers in a subgroup analysis of patients using ß-blockers in terms of eBPR. It is noteworthy that certain points should be considered when evaluating eBPR in terms of the clinical importance of this phenomenon.

In their comprehensive review, Schultz et al.[2] recommended considering the patient's cardiorespiratory fitness status and exercise workload level when evaluating eBPR during exercise.[2] Although Mert et al.[1] acknowledged in the limitations section of their article that the lack of data on the cardiorespiratory fitness status of the included patients was an important limitation, the results section highlights a notable statistical difference in exercise workload levels.[1] In Table 1, which examines all patients included in the study, it is observed that patients with eBPR during exercise achieved higher exercise workload (Metabolic Equivalent of Task (METs)) levels (10.2 vs. 10.9, $P < 0.001$). Table 2 presents the statistical data of patients using different ß-blockers. Here too, the difference in achieved METs values is apparent (highest in the Bisoprolol and Nebivolol groups at 9.1, and lowest in the Carvedilol group at 7.8, $P = 0.003$). Differences in total exercise duration, VO_2 measurements, and total exercise distances across groups are also noted. The increase in systolic blood pressure with exercise depends on age and gender—the slope is flatter in women and healthy young adults—and has been reported to be between 5-8 mmHg for each METs increase in exercise workload.[3] A patient with a higher cardiorespiratory fitness level demonstrates the ability to exercise for longer periods and achieve higher exercise workloads in terms of METs, which results in higher systolic blood pressure. The absence of standardization in exercise workload can lead to similar measurements of exercise systolic blood pressure in patients with different cardiorespiratory fitness levels and can prevent the proper interpretation of the presence of eBPR.[3] In another study, it was suggested that systolic blood pressure be measured during a fixed, submaximal exercise with moderate intensity workload (around 70% of the age-predicted maximum heart rate and stages 1-2 of a standard Bruce treadmill protocol).[4] It is also suggested that, in order to interpret eBPR in patients with unequal exercise workloads, the systolic blood pressure (SBP) response can be evaluated together with the ratio of workload (SBP/METs slope).[5]

Subclinical vascular inflammation may lead to endothelial dysfunction and prevent the decrease in peripheral vascular resistance that should occur with exercise. In a prospective study involving healthy adults, higher levels of high-sensitivity C-reactive protein (hs-CRP) were found in participants with eBPR.[6]

In conclusion, the patient's cardiorespiratory fitness level, as well as the external exercise workload achievement, should also be taken into consideration when interpreting the eBPR observed during exercise tests. Finally, the possible presence of accompanying subclinical vascular inflammation should not be overlooked.

Ali Çoner

Department of Cardiology, Alanya Alaaddin Keykubat University, Antalya, Türkiye

Corresponding author:
Ali Çoner
✉ conerali@hotmail.com

Received: January 22, 2024
Accepted: March 14, 2024

Cite this article as: Çoner A. Correct interpretation of exaggerated blood pressure response during exercise tests. *Turk Kardiyol Dern Ars.* 2024;52(4):302-303.

DOI:10.5543/tkda.2024.65357

Conflict of Interest: The authors have no conflicts of interest to declare.

Funding: The authors declared that this study received no financial support.

References

1. Mert GÖ, Şener E, Yılmaz AS, et al. Different Cardio-Selective ß-Blockers and the Prevention of Exaggerated Blood Pressure Response During Exercise: A Retrospective Cross-Sectional Study. *Turk Kardiyol Dern Ars*. 2024;52(1):27-35. English. [CrossRef]
2. Schultz MG, La Gerche A, Sharman JE. Cardiorespiratory Fitness, Workload, and the Blood Pressure Response to Exercise Testing. *Exerc Sport Sci Rev*. 2022;50(1):25-30. [CrossRef]
3. Currie KD, Floras JS, La Gerche A, Goodman JM. Exercise Blood Pressure Guidelines: Time to Re-evaluate What is Normal and Exaggerated? *Sports Med*. 2018;48(8):1763-1771. [CrossRef]
4. Schultz MG, Currie KD, Hedman K, et al. The Identification and Management of High Blood Pressure Using Exercise Blood Pressure: Current Evidence and Practical Guidance. *Int J Environ Res Public Health*. 2022;19(5):2819. [CrossRef]
5. Bauer P, Kraushaar L, Dörr O, Nef H, Hamm CW, Most A. Workload-indexed blood pressure response to a maximum exercise test among professional indoor athletes. *Eur J Prev Cardiol*. 2021;28(13):1487-1494. [CrossRef]
6. Çoner A, Gençtoy G, Akinci S, Altin C, Müderrisoğlu H. Assessment of vascular inflammation and subclinical nephropathy in exaggerated blood pressure response to exercise test. *Blood Press Monit*. 2019;24(3):114-119. [CrossRef]