# Common Determinants of Blood Pressure and Testosterone Level

*Yusuf Ziya Şener*[1] *and Alexandr Ceasovschih*[2]

*Hacettepe University Faculty of Medicine – Internal Medicine Department,*[1] *Ankara – Turkey*
*Faculty of Medicine – "Grigore T. Popa" University of Medicine and Pharmacy,*[2] *Iasi – Romania*

**Dear Editor,**

We read the article published by Negretto et al.[1] with great interest. The authors reported testosterone deficiency is present in 26.3% of the patients with arterial hypertension and testosterone levels decrease by increasing age and body mass index.[1] The role of testosterone in hypertension and factors affecting both arterial blood pressure and testosterone level are interesting and overlooked topics in daily practice.

Alcohol consumption is frequent worldwide and it has effects on both testosterone levels and blood pressure. It was demonstrated that high-dose alcohol consumption yields a decrease in blood pressure up to 12 hours however it raises blood pressure 12 hours after consumption.[2] Despite there are conflicting data about the impact of alcohol on testosterone levels, general consensus supports that chronic alcohol consumption results in testosterone deficiency.[3] Therefore it would be better if the status of alcohol consumption had been taken into consideration.

Thyroid hormones play a main role in the control of several metabolic pathways and both hypothyroidism and hyperthyroidism may lead to increased blood pressure.[4] Thyroid hormone increases sex hormone binding globulin and total testosterone levels. Hypothyroidism causes reduced response to gonadotropin-releasing hormone (GnRH) resulting in decreased free testosterone levels.[5] Thus, thyroid functions play a significant role in the interaction between blood pressure and testosterone levels.

Beta-blockers are commonly used in cardiovascular diseases and upgraded to the first-line treatment option for hypertension recently.[6] Several studies established that beta-blockers decrease the level of testosterone and cause erectile dysfunction.[7] Therefore, we think that it would be better if the use of beta-blockers had been assessed in the present study.

To conclude, testosterone plays a significant role in blood pressure and it should be kept in mind that several factors have an impact on the interaction between blood pressure and testosterone levels.

## Keywords

Arterial Pressure; Hypertension; Testosterone; Obesity; Hypogonadism; Self-Neglect

**Mailing Address: Yusuf Ziya Şener** •
Hacettepe University Faculty of Medicine, Internal Medicine Department, Sıhhiye, Ankara – Turkey
E-mail: yzsener@yahoo.com.tr
Manuscript received November 26, 2023, revised manuscript March 13, 2024, accepted March 27, 2024

**DOI:** https://doi.org/10.36660/abc.20240234i

## References

1. Negretto LAF, Rassi N, Soares LR, Saraiva ABC, Teixeira MEF, Santos LR et al. Testosterone Deficiency in Hypertensive Men: Prevalence and Associated Factors. Arq. Bras. Cardiol. 2024. 121 (3).
2. Tasnim S, Tang C, Musini VM, Wright JM. Effect of alcohol on blood pressure. Cochrane Database Syst Rev. 2020 Jul 1;7(7):CD012787. doi: 10.1002/14651858.CD012787.pub2.
3. Koh K, Kim SS, Kim JS, Jung JG, Yoon SJ, Suh WY, et al. Relationship between Alcohol Consumption and Testosterone Deficiency according to Facial Flushes among Middle-Aged and Older Korean Men. Korean J Fam Med. 2022 Nov;43(6):381-387. doi: 10.4082/kjfm.21.0173.
4. Danzi S, Klein I. Thyroid hormone and blood pressure regulation. Curr Hypertens Rep. 2003 Dec;5(6):513-20. doi: 10.1007/s11906-003-0060-7.
5. Meikle AW. The interrelationships between thyroid dysfunction and hypogonadism in men and boys. Thyroid. 2004;14 Suppl 1:S17-25. doi: 10.1089/105072504323024552.
6. Messerli FH, Bangalore S, Mandrola JM. β blockers switched to first-line therapy in hypertension. Lancet. 2023 Nov 11;402(10414):1802-1804. doi: 10.1016/S0140-6736(23)01733-6.
7. Nicolai MP, Liem SS, Both S, Pelger RC, Putter H, Schalij MJ, Elzevier HW. A review of the positive and negative effects of cardiovascular drugs on sexual function: a proposed table for use in clinical practice. Neth Heart J. 2014 Jan;22(1):11-9. doi: 10.1007/s12471-013-0482-z.

## Reply

**Dear Editor,**

We would like to thank you for diligently reading the article, which was the result of a real-life study in which Total Testosterone (TT) values were evaluated in hypertensive men, seeking the prevalence of hormone deficiency (TT < 300nd/dL) as well as the association with several factors considered to be of prominent relevance.[1]

Although alcohol consumption is indeed a threat to cardiovascular health,[2] your research would make this study too challenging, given that it would be necessary to use a standardized assessment instrument[3] to measure and document the magnitude of alcohol use.

Furthermore, it is widely known that individuals who abuse alcohol often need to be accompanied when questioned in this regard, which could potentially compromise the assessment of sexual health,[4] as this is a topic that can hurt the patient's modesty.

Even though thyroid function is relevant in different scenarios of cardiovascular disease,[5] it is not part of the routine exams for hypertensive individuals.[6-8] The study was developed in a tertiary care center at a Federal University of Medicine in Brazil, carried out without a funding source so that the tests collected were those considered crucial for the workup of individuals with hypertension (AH).

Beta-blockers are in fact first-line antihypertensives in the treatment of AH around the world, however, when compared to other classes of antihypertensives widely used in AH, there is no significant difference regarding the potential negative impact on male sexual health.[9]

The use of Spironolactone, in turn, was considered a pertinent variable in this study, as it is notably a drug with anti-androgenic action,[10] which could bias the study if it were not actively sought.

Although male hormone levels are especially relevant in contexts of increased cardiovascular risk, they still do not form part of the workup for individuals with AH, as well as the approach to possible causes of deficiency.

In this way, we would like to thank you for the considerations mentioned, which can be of great use in future studies, which are so necessary to shed light on this topic that is still so neglected.

**Leandra Analia Freitas Negretto**
**Nelson Rassi**
**Leonardo Ribeiro Soares**
**Amanda Bueno Carvalho Saraiva**
**Maria Emília Figueiredo Teixeira**
**Luciana da Ressurreição Santos**
**Ana Luiza Lima Souza**
**Paulo Cesar B. Veiga Jardim**
**Weimar Kunz Sebba Barroso de Souza**
**Thiago de Souza Veiga Jardim**

## References

1. Negretto LA, Rassi N, Soares LR, Saraiva AB, Teixeira ME, Santos LR, et al. Testosterone Deficiency in Hypertensive Men: Prevalence and Associated Factors. Arq Bras Cardiol. 2024;121(3) e20230138. doi: 10.36660/abc.20230138.
2. Day E, Budd JHF. Alcohol use disorders and the heart. Adiction. 2019;114(9):1670-8. Doi: 10.1111/add.147.03.
3. Cardoso DP, Oliveira D, Antunes B, Saraiva R, Angus K, Galardo E, et al. Portuguese Validated Versions of the Alcohol Use Disorders Identification Test: A Systematic Review Protocol. Acta Med Port. 2022;35(4):264-9. doi: 10.20344/amp.15765.
4. Morley JE, Charlton E, Patrick P, Kaiser FE, Cadeau P, McCready D, et al. Validation of a screening questionnaire for androgen deficiency in aging males. Metabolism. 2000;49(9):1239–42. doi: 10.1053/meta.2000.8625.
5. Cappola AR, Desai AS, Medici M, Cooper LS, Egan D, Sopko G, et al. Thyroid and Cardiovascular Disease: Research Agenda for Enhancing Knowledge, Prevention, and Treatment. Circulation. 2019;139(25):2892–909. doi: 10.1161/CIRCULATIONAHA.118.036859.
6. Barroso WK, Rodrigues CI, Bortolotto LA, Gomes MA, Brandão AA, Feitosa AD, et al. Brazilian guidelines of hypertension - 2020. Arq Bras Cardiol. 2021;116(3):516–658. doi: 10.36660/abc.20201238.
7. Arnett DK, Blumenthal RS, Albert MA, Buroker AB, Goldberger ZD, Hahn EJ, et al. 2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Circulation. 2019;140(11):e596–646. doi: 10.1161/CIR.0000000000000678.
8. Whelton PK, Carey RM, Mancia G, Kreutz R, Bundy JD, Williams B. Circulation Society of Hypertension Blood Pressure/Hypertension Guidelines: Comparisons, Reflections, and Recommendations. Circulation. 2022;146(11):868–77. doi: 10.1161/CIRCULATIONAHA.121.054602.
9. Farmakis IT, Pyrgidis N, Doundoulakis I, Mykoniatis I, Akrivos E, Giannakoulas G. Effects of Major Antihypertensive Drug Classes on Erectile Function: a Network Meta-analysis. Cardiovasc Drugs Ther. 2022;36(5):903–14. doi: 10.1007/s10557-021-07197-9.
10. Bagnoli V, Fonseca A, Cezarino P, Fassolas G, Arie J, Baracat E. Hormonal treatment of acne based on evidence. Femina. 2010;38(11)566-74. Disponível em: http://www.nature.com/eye/journal/v17/n8/.