EFECTOS DE UNA INTERVENCIÓN DE INMERSIÓN CONSCIENTE BASADA EN LA NATURALEZA (VITAMINA N) COMO TRATAMIENTO COMPLEMENTARIO EN LA MODULACIÓN DE LA PRESIÓN ARTERIAL EN PACIENTES HIPERTENSOS

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RESUMEN

Antecedentes: La hipertensión (HTA) es un problema global de salud pública, especialmente en países en desarrollo. Aunque los tratamientos farmacológicos son efectivos, terapias complementarias como las intervenciones basadas en la naturaleza (IBN) han surgido como alternativas prometedoras. La Vitamina N implica la exposición estructurada a entornos naturales, lo que ha demostrado potencial para reducir la presión arterial mediante la reducción del estrés y la mejora de la función endotelial.

Objetivo: Evaluar los efectos de la inmersión consciente en la naturaleza (Vitamina N) sobre la modulación de la presión arterial en pacientes hipertensos y comparar los resultados entre entornos naturales y urbanos.

Metodología: Este estudio longitudinal cuasi-experimental incluyó pacientes hipertensos de entre 18 y 70 años bajo tratamiento antihipertensivo estable. Los pacientes participaron en dos sesiones de terapia de inmersión consciente en la naturaleza: una en la Ciénaga de Mallorquín y otra en un parque urbano de Barranquilla. Las variables evaluadas incluyeron la presión arterial sistólica y diastólica, así como escalas de bienestar (WHO-5, PANAS y WEMWBS) antes y después de cada intervención.

Resultados: Se observó una disminución significativa en la presión arterial sistólica después de la intervención en la Ciénaga de Mallorquín, con una mediana de 148.25 mmHg antes de la intervención, que descendió a 121.5 mmHg después. Los pacientes que tomaban múltiples medicamentos antihipertensivos mostraron una mayor respuesta a la intervención. En la intervención urbana, la reducción de la presión arterial fue menos pronunciada y no estadísticamente significativa.

Conclusión: La inmersión consciente en la naturaleza demostró ser eficaz para reducir la presión arterial sistólica, especialmente en entornos naturales inmersivos como la Ciénaga de Mallorquín. Estos resultados sugieren que las intervenciones basadas en la naturaleza pueden complementar los tratamientos farmacológicos en el manejo de la hipertensión, aunque los efectos a largo plazo requieren estudios adicionales para determinar su sostenibilidad.

Palabras clave: Hipertensión, Presión Arterial, Terapias Complementarias, Exposición a la Naturaleza

ABSTRACT

Background: Hypertension is a global public health issue, particularly in developing countries. Although pharmacological treatments are effective, complementary therapies such as nature-based interventions (NBI) have emerged as promising alternatives. Vitamin N involves structured exposure to natural environments, which has shown potential in reducing blood pressure by lowering stress and improving endothelial function.

Objective: To evaluate the effects of conscious nature immersion (Vitamin N) on blood pressure modulation in hypertensive patients and to compare the results between natural and urban environments.

Methodology: This longitudinal quasi-experimental study included hypertensive patients aged 18 to 70 years under stable antihypertensive treatment. Patients participated in two sessions of conscious nature immersion therapy: one at the Mallorquín Lagoon and another in an urban park in Barranquilla. The variables evaluated included systolic and diastolic blood pressure, as well as well-being scales (WHO-5, PANAS, and WEMWBS) before and after each intervention.

Results: A significant decrease in systolic blood pressure was observed after the intervention in the Mallorquín Lagoon, with a median of 148.25 mmHg before the intervention, which dropped to 121.5 mmHg after. Patients on multiple antihypertensive medications showed a greater response to the intervention. In the urban intervention, the reduction in blood pressure was less pronounced and not statistically significant.

Conclusion: Conscious nature immersion was effective in reducing systolic blood pressure, especially in immersive natural environments like the Mallorquín Lagoon. These results suggest that nature-based interventions can complement pharmacological treatments in managing hypertension, although long-term effects require further study to determine sustainability.

Keywords: Hypertension, Blood Pressure, Complementary Therapies, Nature Exposure

REFERENCIAS BIBLIOGRÁFICAS

1. Mills KT, Stefanescu A, He J. The global epidemiology of hypertension. Nat Rev Nephrol. 2020;16(4):223-37. doi:10.1038/s41581-019-0244-2.

2. Zhou B, Perel P, Mensah GA, Ezzati M. Global epidemiology, health burden and effective interventions for elevated blood pressure and hypertension. Nat Rev Cardiol. 2021;18(11):785-802. doi:10.1038/s41569-021-00559-8.

3. Mills KT, Bundy JD, Kelly TN, et al. Global disparities of hypertension prevalence and control: a systematic analysis of population-based studies from 90 countries. Circulation. 2016;134(6):441-50. doi:10.1161/CIRCULATIONAHA.115.018912.

4. Mittal BV, Singh AK. Hypertension in the developing world: challenges and opportunities. Am J Kidney Dis. 2010;55(3):590-8. doi: 10.1053/j.ajkd.2009.06.044.

5. Arima H, Barzi F, Chalmers J. Mortality patterns in hypertension. J Hypertens. 2011;29 Suppl 1 . doi: 10.1097/01.hjh.0000410246.59221.b1.

6. Whelton PK, Carey RM, Aronow WS, et al. 2017. ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association task force on clinical practice guidelines. Circulation. 2018;138(17) . doi:10.1161/CIR.0000000000000596.

7. Brook RD, Appel LJ, Rubenfire M, et al. Beyond medications and diet: alternative approaches to lowering blood pressure: a scientific statement from the American Heart Association. Hypertension. 2013;61(6):1360-83. doi:10.1161/HYP.0b013e318293645f.

8. Lattanzio M, Weir MR. An evidence-based appraisal of complementary and alternative medicine strategies for the management of hypertension. J Hypertens. 2020;38(8):1412-9. doi:10.1097/HJH.0000000000002433.

9. Blazek O, Bakris GL. Novel therapies on the horizon of hypertension management. Am J Hypertens. 2023;36(2):73-81. doi:10.1093/ajh/hpac111.

10. Ojangba T, Boamah S, Miao Y, et al. Comprehensive effects of lifestyle reform, adherence, and related factors on hypertension control: a review. J Clin Hypertens (Greenwich). 2023;25(6):509-20. doi:10.1111/jch.14653.

11. Struthers NA, Guluzade NA, Zecevic AA, Walton DM, Gunz A. Nature-based interventions for physical health conditions: a systematic review and meta-analysis. Environ Res. 2024;258:119421. doi:10.1016/j.envres.2024.119421.

12. Zhao Y, Bao WW, Yang BY, et al. Association between greenspace and blood pressure: a systematic review and meta-analysis. Sci Total Environ. 2022;817:152513. doi:10.1016/j.scitotenv.2021.152513.

13. Chien JW, Wu C, Chan CC. The association of hypertension and prehypertension with greenness and PM in urban environment. Sci Total Environ. 2022;821:153526. doi:10.1016/j.scitotenv.2022.153526.

14. Zhao Y, Bao WW, Yang BY, et al. Association between greenspace and blood pressure: a systematic review and meta-analysis. Sci Total Environ. 2022;817:152513. doi:10.1016/j.scitotenv.2021.152513.

15. Qiu Q, Yang L, He M, et al. The effects of forest therapy on the blood pressure and salivary cortisol levels of urban residents: a meta-analysis. Int J Environ Res Public Health. 2022;20(1):458. doi:10.3390/ijerph20010458.

16. Liu M, Timmermans EJ, Zou D, et al. Impact of green space exposure on blood pressure in Guangzhou, China: mediation by air pollution, mental health, physical activity, and weight status. Environ Pollut. 2024;356:124251. doi:10.1016/j.envpol.2024.124251.

17. Verma N, Rastogi S, Chia YC, et al. Non-pharmacological management of hypertension. J Clin Hypertens (Greenwich). 2021;23(7):1275-83. doi:10.1111/jch.14236.

18. Rojas JPL, Turizo JM. Percepción de la comunidad de la Ciénaga de Mallorquín frente a la propuesta de transformación paisajística para el avance de Barranquilla como biodiverciudad. Erg@ Omnes. 2021;13(1):207-20.

19. Vargas A, Roldán P. Ni muy cerca ni muy lejos: parques urbanos y bienestar subjetivo en la ciudad de Barranquilla, Colombia. Lect Econ. 2018;(88):183-205.

20. Miranda OR, Peña GB. Políticas públicas en parques de Barranquilla para la generación de desarrollo económico y social. Ad-Gnosis. 2024;13(13).

21. Li H, Browning MHEM, Rigolon A, et al. Beyond "bluespace" and "greenspace": a narrative review of possible health benefits from exposure to

other natural landscapes. Sci Total Environ. 2023;856(Pt 2):159292. doi:10.1016/j.scitotenv.2022.159292.

22. Jarvis I, Koehoorn M, Gergel SE, van den Bosch M. Different types of urban natural environments influence various dimensions of self-reported health. Environ Res. 2020;186:109614. doi:10.1016/j.envres.2020.109614.

23. Yao W, Luo Q, Zhang X, Zhuo C, Mi L. Exploring the effect of different typical plant community on human stress reduction: a field experiment. Sci Rep. 2024;14(1):5600. doi:10.1038/s41598-024-56243-7.

24. Schebella MF, Weber D, Schultz L, Weinstein P. The nature of reality: human stress recovery during exposure to biodiverse, multisensory virtual environments. Int J Environ Res Public Health. 2019;17(1) . doi:10.3390/ijerph17010056.

25. Li Y, Haseler E, McNally R, Sinha MD, Chowienczyk PJ. A Meta-Analysis of the Haemodynamics of Primary Hypertension in Children and Adults. Journal of Hypertension. 2023;41(2):212-219. doi:10.1097/HJH.0000000000003326.

26. Mahajan S, Gu J, Lu Y, et al. Hemodynamic Phenotypes of Hypertension Based on Cardiac Output and Systemic Vascular Resistance. The American Journal of Medicine. 2020;133(4) doi:10.1016/j.amjmed.2019.08.042.

27. Kulkarni S, Wilkinson IB. Adrenoceptors and Hypertension. Handbook of Experimental Pharmacology. 2024;285:297-332. doi:10.1007/164_2024_719.

28. Suvorava T, Metry S, Pick S, Kojda G. Alterations in Endothelial Nitric Oxide Synthase Activity and Their Relevance to Blood Pressure. Biochemical Pharmacology. 2022;205:115256. doi:10.1016/j.bcp.2022.115256.

29. Carey RM, Moran AE, Whelton PK. Treatment of Hypertension: A Review. Jama. 2022;328(18):1849-1861. doi:10.1001/jama.2022.19590.

30. Clarke SL. Hypertension in Adults: Initial Evaluation and Management. American Family Physician. 2023;108(4):352-359.

31. Charchar FJ, Prestes PR, Mills C, et al. Lifestyle Management of Hypertension: International Society of Hypertension Position Paper Endorsed by the World Hypertension League and European Society of Hypertension. Journal of Hypertension. 2024;42(1):23-49. doi:10.1097/HJH.0000000000003563.

32. Smith DK, Lennon RP, Carlsgaard PB. Managing Hypertension Using Combination Therapy. American Family Physician. 2020;101(6):341-349

33. Zhao Y, Bao WW, Yang BY, et al. Association Between Greenspace and Blood Pressure: A Systematic Review and Meta-Analysis. The Science of the Total Environment. 2022;817:152513. doi:10.1016/j.scitotenv.2021.152513.

34. Struthers NA, Guluzade NA, Zecevic AA, Walton DM, Gunz A. Nature-Based Interventions for Physical Health Conditions: A Systematic Review and Meta-Analysis. Environmental Research. 2024;258:119421. doi:10.1016/j.envres.2024.119421.

35. Qiu Q, Yang L, He M, et al. The Effects of Forest Therapy on the Blood Pressure and Salivary Cortisol Levels of Urban Residents: A Meta-Analysis. International Journal of Environmental Research and Public Health. 2022;20(1):458. doi:10.3390/ijerph20010458.

36. Yang BY, Markevych I, Bloom MS, et al. Community Greenness, Blood Pressure, and Hypertension in Urban Dwellers: The 33 Communities Chinese Health Study. Environment International. 2019;126:727-734. doi:10.1016/j.envint.2019.02.068.

37. Dzhambov AM, Lercher P, Markevych I, Browning MHEM, Rüdisser J. Natural and Built Environments and Blood Pressure of Alpine Schoolchildren. Environmental Research. 2022;204(Pt A):111925. doi:10.1016/j.envres.2021.111925.

38. Nguyen PY, Astell-Burt T, Rahimi-Ardabili H, Feng X. Effect of Nature Prescriptions on Cardiometabolic and Mental Health, and Physical Activity: A Systematic Review. The Lancet Planetary Health. 2023;7(4) . doi:10.1016/S2542-5196(23)00025-6.

39. Qiu Q, Yang L, He M, et al. The effects of forest therapy on the blood pressure and salivary cortisol levels of urban residents: a meta-analysis. Int J Environ Res Public Health. 2022;20(1):458. doi:10.3390/ijerph20010458.

40. Yau KK, Loke AY. Effects of forest bathing on pre-hypertensive and hypertensive adults: a review of the literature. Environ Health Prev Med. 2020;25(1):23. doi:10.1186/s12199-020-00856-7.

41. Song C, Ikei H, Kobayashi M, et al. Effect of forest walking on autonomic nervous system activity in middle-aged hypertensive individuals: a pilot study. Int J Environ Res Public Health. 2015;12(3):2687-99. doi:10.3390/ijerph120302687.

42. Ibáñez M, Cañavera R, Santacruz J, Blandón Rentería L, Quintero A, Moreno J, et al. Efecto de la terapia de la Vitamina N (inmersión consciente en la

naturaleza) en sujetos con hipertensión arterial sistémica. Cienc Latina Rev Cient Multidiscip. 2024;8:6736-60. doi:10.37811/cl_rcm.v8i1.10034

43. Hedayati SS, Elsayed EF, Reilly RF. Non-Pharmacological Aspects of Blood Pressure Management: What Are the Data?. Kidney International. 2011;79(10):1061-70. doi:10.1038/ki.2011.46.

44. Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/-ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Hypertension (Dallas, Tex. : 1979). 2018;71(6). doi:10.1161/HYP.0000000000000065.

45. Carey RM, Calhoun DA, Bakris GL, et al. Resistant Hypertension: Detection, Evaluation, and Management: A Scientific Statement from the American Heart Association. Hypertension (Dallas, Tex.: 1979). 2018;72(5). doi:10.1161/HYP.0000000000000084.

46. Campo-Arias Adalberto, Miranda-Tapia Giskar Alonso, Cogollo Zuleima, Herazo Edwin. Reproducibilidad del Índice de Bienestar General (WHO-5 WBI) en estudiantes adolescentes. Salud, Barranquilla [Internet]. 2015 Jan [cited 2024 Oct 14] ; 31(1): 18-24.

47. Cantor Parra LS, Clavijo Benavidez MP. Adaptación y validación de la escala de afectividad positiva y negativa (PANAS) al contexto colombiano, en una muestra de madres solteras en la ciudad de Bogotá, Colombia. 2020.

48. Serrani Azcurra D. Traducción, adaptación al español y validación de la escala de bienestar mental de Warwick-Edinburgh en una muestra de adultos mayores argentinos. Acta Colomb Psicol. 2015;18(1):79-93.

49. Hedayati SS, Elsayed EF, Reilly RF. Non-Pharmacological Aspects of Blood Pressure Management: What Are the Data? Kidney Int. 2011;79(10):1061-70. doi:10.1038/ki.2011.46.

50. Fu J, Liu Y, Zhang L, et al. Nonpharmacologic Interventions for Reducing Blood Pressure in Adults With Prehypertension to Established Hypertension. J Am Heart Assoc. 2020;9(19). doi:10.1161/JAHA.120.016804.

51. Whelton PK, Carey RM, Aronow WS, et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Hypertension. 2018;71(6) doi:10.1161/HYP.0000000000000065.

52. Ojangba T, Boamah S, Miao Y, et al. Comprehensive Effects of Lifestyle Reform, Adherence, and Related Factors on Hypertension Control: A Review. J Clin Hypertens (Greenwich). 2023;25(6):509-520. doi:10.1111/jch.14653.

53. Blumenthal JA, Hinderliter AL, Smith PJ, et al. Effects of Lifestyle Modification on Patients With Resistant Hypertension: Results of the TRIUMPH Randomized Clinical Trial. Circulation. 2021;144(15):1212-1226. doi:10.1161/CIRCULATIONAHA.121.055329

54. Espinel E, Azancot MA, Gomez A, et al. Compliance to Multidisciplinary Lifestyle Intervention Decreases Blood Pressure in Patients With Resistant Hypertension: A Cross-Sectional Pilot Study. J Clin Med. 2023;12(2):679. doi:10.3390/jcm12020679.