Internal MedicineToday
Gonabad University of Medical Sciences
May 2024. Vol 30. Issue 3

Policy Brief

Potential of *Ziziphus jujuba* in the Management of Hypertension

Reza Mohebbati[1,2*]

1. Nursing Research Center, Gonabad University of Medical Sciences, Gonabad, Iran
2. Applied Biomedical Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

Use your device to scan and read the artide online

Citation Mohebbati R, [Potential of *Ziziphus jujuba* in the Management of Hypertension]. Internal MedicineToday. 2024; 30(3): 92-93.

:https://doi.org/10.22034/imtj.2024.30.3.92

Received: 24 Jul 2023
Accepted: 04 Feb 2024
Available Online: 30 May 2024

* ***Corresponding Author:***
Reza Mohebbati, MD.
Address: Nursing Research Center, Gonabad University of Medical Sciences, Gonabad, Iran
Tel: +98 5157223028
E-mail: Mohebbatir@gmail.com

Introduction

Hypertension remains a leading global cause of cardiovascular morbidity and mortality. Despite the availability of various synthetic antihypertensive agents, adverse effects and treatment resistance highlight the need for complementary natural remedies. *Ziziphus jujuba* (jujube), a member of the Rhamnaceae family, is traditionally used in Iranian medicine for cardiovascular health and may offer therapeutic benefits in blood pressure regulation.

Problem

Endothelial dysfunction and nitric oxide (NO) deficiency are central to hypertension pathophysiology. The two major classes of blood pressure control drugs, which act as synthetic NO donors or renin-angiotensin system inhibitors, are often associated with side effects. Therefore, identifying safe phytotherapeutic options that restore vascular homeostasis via the NO pathway or modulation of the renin-angiotensin system (RAS) is a public health priority in integrative cardiovascular management.

Analysis

Animal studies led by Dr. Reza Mohebbati et al. have systematically demonstrated the antihypertensive potential of *Ziziphus jujuba*:

1. L-NAME-induced hypertension model: Long-term administration of hydroalcoholic extract of *Ziziphus jujuba* (100–400 mg/kg) significantly attenuated the elevation in systolic and mean arterial blood pressure induced by NO inhibition. The lowest dose (100 mg/kg) was most effective, suggesting optimal biological activity at moderate concentrations.
2. Angiotensin II-induced hypertension model: Pretreatment with *Ziziphus jujuba* extract (100–200 mg/kg) decreased blood pressure elevations caused by Ang II administration, indicating partial suppression of the RAS pathway. The effect reversed at higher doses, showing possible biphasic dose-dependency.
3. Normotensive response: Hydroalcoholic extract reduced baseline SBP and MAP in normotensive rats only at higher dosages (200–400 mg/kg), implying safety at therapeutic ranges and absence of excessive hypotension

Mechanistically, the hypotensive effects are attributed to enhanced NO bioavailability, antioxidant activity, and possible modulation of calcium influx in vascular smooth muscle.

Recommendations

1. Clinical application: Well-designed clinical trials were conducted to evaluate standardized jujube extracts in patients with uncontrolled or primary hypertension. It should be noted that clinical work in this area is being carried out by the research team of this project, and so far, we have achieved good results.
2. Standardization: Phytochemical quality control was established, focusing on active compounds, such as jujubeside saponins and flavonoids. This work was also carried out by the aforementioned team, and the presence of effective compounds has been confirmed.
3. Integrated guidelines: It is recommended that jujube supplementation be included in national integrated medicine policies for the prevention of hypertension in high-risk populations.
4. Dose optimization: Further studies are encouraged to investigate dose-response and toxicity to define safe treatment intervals and avoid contradictory effects at high doses.
5. Mechanistic research: Molecular research is prioritized on NO-cGMP signaling and RAS modulation to confirm pharmacodynamic pathways.

Conclusion

The findings from multiple preclinical studies by Dr. Reza Mohabbati's team provide compelling evidence that jujube extract provides vascular protection, primarily through increased endothelial NO signaling and partial suppression of the renin-angiotensin axis. Clinical evidence in an ongoing project has also confirmed these findings so far. Incorporating jujube into evidence-based herbal therapeutic strategies could contribute to safer and more sustainable hypertension management options.

References

[1]. Mohebbati R, Bavarsad K, Rahimi M, Rakhshandeh H, Rad AK, Shafei MN. Protective effects of long-term administration of Ziziphus jujuba fruit extract on cardiovascular responses in L-NAME hypertensive rats. Avicenna J Phytomed. 2018;8(2):143-51. [PMID] [PMCID]

[2]. Kamkar-Del Y, Mohebbati R, Hosseini M, Khajavirad A, Shafei MN, Rakhshandeh H. Ethyl acetate and aqueous fractions of Ziziphus jujuba prevent acute hypertension induced by angiotensin II in rats. Cardiovasc Hematol Disord Drug Targets. 2020;20(2):108-15. [DOI: 10.2174/1871529x19666191119141400] [PMID]

[3]. Mohebbati R, Rahimi M, Bavarsad K, Shafei MN. Long-term administration of Ziziphus jujuba extract attenuates cardiovascular responses in hypertensive rats induced by angiotensin II. Anc Sci Life. 2017;37(2):68-73. [DOI: 10.4103/asl.ASL_122_17]

[4]. Mohebbati R, Rahimi M, Bavarsad K, Beheshti F, Khajavirad A, Shafei MN. Hypotensive effect of hydroalcoholic Ziziphus jujuba extract on normotensive rats. Curr Nutr Food Sci. 2019;15(7):712-7. [DOI: 10.2174/1573401314666180620162733]

[5]. Shahraki S, Shahbeiki F, Mohebbati R. Cytotoxicity effect of Ziziphus jujuba L., Ribes khorasanicum, Crocus sativus petal, and Centella asiatica extracts on NIH/3T3 cell line. Herb Med J. 2023;8(1):1-8. [Link]