



Analyzing Celery Seed Extract's Role in Hypertension Management: A Clinical Trial Commentary

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Abstract:

Hypertension, or high blood pressure, stands as a silent but formidable precursor to a multitude of cardiovascular diseases, demanding effective intervention. While pharmaceuticals are the primary course of treatment, a recent clinical trial has explored the potential of celery seed extract as a natural supplement in managing this condition. This essay scrutinizes its design, outcomes, and implications, and underscores the significance of these findings in the broader context of cardiovascular health.

Keywords: Celery, Hypertension, Randomized Controlled Trials.

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Introduction

Hypertension is a pervasive global health issue, associated with a heightened risk of cardiovascular diseases and their grim consequences. Managing blood pressure is of paramount importance, traditionally achieved through antihypertensive medications. However, there is growing interest in complementary and alternative therapies. Herbal remedies have shown promising results.^{1,2} One such natural remedy under investigation is celery seed extract (figure 1), which is subject of a recent clinical trial aimed at assessing its potential antihypertensive effects.

Clinical Trial Design

The trial design employed in this study is worthy of note.³ A cross-over placebo-controlled design was selected, minimizing confounding factors and the influence of co-administered medications, given that celery extract can alter the pharmacokinetics and pharmacodynamics of certain drugs. The utilization of ambulatory blood pressure monitoring (ABPM) ensured the collection of precise data, free from the white-coat effect and observer bias, providing a more authentic representation of blood pressure patterns. The 24-hours BP measurement, which is superior in predicting cardiovascular-related

events compared to office-measured BP, adds clinical relevance to the study.

Results

The findings of this clinical trial were striking. Celery seed extract induced a statistically and clinically significant reduction in both systolic blood pressure (SBP) and diastolic blood pressure (DBP), with reductions of 11.17 mmHg and 8.005 mmHg, respectively. These reductions are substantial, given that a 5-mmHg reduction in SBP has been linked to a 10% reduction in the risk of major cardiovascular events. Moreover, no significant change was observed in heart rate (HR), implying that celery seed extract may achieve its antihypertensive effects primarily through vasodilation, without triggering reflex tachycardia.

Discussion

The primary aim of this clinical trial was to investigate the potential antihypertensive effects of celery seed extract as a dietary supplement. The trial has been done at the backdrop of multiple studies done on celery seeds which include animal studies,^{4,5} pilot studies,⁶ and randomized controlled trials (RCTs).^{7,8} To ensure the validity of the

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Figure 1: Celery seeds and capsules prepared from its extract.

findings, a carefully designed cross-over, placebo-controlled study was employed. The choice of a cross-over design, wherein each participant served as their control, is noteworthy. This approach effectively minimizes the influence of confounding factors and inter-individual variability, allowing for a more precise evaluation of the intervention's impact.

Moreover, the selection of 24-hours ABPM as the primary outcome measure is a commendable aspect of the trial design. ABPM is a superior method compared to conventional office-based blood pressure measurements because it captures blood pressure data over an extended period under real-life conditions. This reduces the likelihood of the “white-coat effect” and minimizes observer bias, contributing to more accurate and reliable results. The 24-hours monitoring also aligns well with the predictive value of cardiovascular-related events, making it a robust choice for assessing the intervention's impact.

The implications of this clinical trial extend beyond the confines of its design and results. Celery seed extract demonstrated promise as an adjunctive therapy for hypertension management. Not only did it lower blood pressure, but it also improved various metabolic and biochemical parameters, including fasting blood sugar, lipid profile, and liver and kidney functions. This suggests that celery seed extract might offer dual benefits—blood pressure control and cardiovascular protection. Furthermore, the study noted that women and individuals with higher baseline SBP levels were more responsive to the treatment, emphasizing the potential for personalized approaches in hypertension management.

The active ingredients in celery seed extract, including apigenin, luteolin, linalool, d-limonene, and phthalides, were discussed in the context of their antihypertensive properties. Apigenin, for instance, exhibited calcium channel-blocking effects, akin to pharmaceutical calcium channel blockers (CCBs). Luteolin demonstrated antioxidant

properties, which are crucial in cardiovascular health. Linalool and d-limonene were associated with vasodilatory and antioxidant activities, contributing to the observed effects. NBP, a phthalide in celery seed extract, was identified as a potential vasodilator and diuretic. Collectively, these ingredients presented a multifaceted approach to reducing blood pressure.

One of the key findings of this study is the significant reduction in SBP and DBP following celery seed extract administration. The mean reduction in SBP of 11.17 mmHg and DBP of 8.005 mmHg is not only statistically significant but also clinically meaningful. These reductions can have a substantial impact on cardiovascular health, reducing the risk of major cardiovascular events by about 10%, even at normal or high-normal blood pressure values. This highlights the potential of celery seed extract as a valuable adjunct in the management of hypertension.

Interestingly, the study also observed a gender-related difference in treatment response, with women exhibiting a higher therapeutic response in blood pressure reduction compared to men. This disparity underscores the importance of considering gender-specific factors in future investigations and tailoring treatment approaches accordingly.

Furthermore, the study explored the impact of celery seed extract on various anthropometric measures, such as waist-to-hip ratio (WHR) and neck circumference (NC), serving as biomarkers of central adiposity and cardiovascular risk. The inclusion of these measures broadens the assessment beyond blood pressure alone, providing a more comprehensive understanding of the intervention's effects.

In terms of safety, the study not only demonstrated that celery seed extract is well-tolerated by hypertensive patients but also revealed several positive side effects reported by participants. These included a reduction in chest pain, improved sleep quality, and a sense of relaxation, all of which contributed to an improved overall quality of life for those undergoing treatment.

While the trial produced promising results, it was not without limitations. The sample size was relatively small, and some patients were excluded from the study. Moreover, the trial's duration for each phase was relatively short. It did not evaluate factors like ethnicity or genetic diversity, which could influence outcomes. These limitations suggest the need for larger studies with longer-term follow-ups to validate and extend these findings.

Conclusion

In conclusion, the clinical trial investigating celery seed extract as a natural supplement for hypertension management presents an exciting avenue in cardiovascular health. The results highlight its potential to not only lower blood pressure but also improve metabolic and biochemical parameters, marking it as a multifaceted approach to cardiovascular risk reduction. While further research is needed to validate these findings and address the study's limitations, celery seed extract offers promise as a natural, safe, and complementary intervention in the fight against hypertension and its associated complications. This trial underscores the importance of exploring holistic approaches to cardiovascular health and encourages future investigations into the potential benefits of natural remedies.

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