RCMOS – Multidisciplinary Scientific Journal of Knowledge.
ISSN: 2675-9128. São Paulo-SP.
Year IV, v.1, n.1, jan./ jul. 2024. | submission: 2024-09-16 | accepted: 2024-09-18 | publication: 2024-09-20

COMPARISON BETWEEN PHARMACOLOGICAL AND NATURAL TREATMENTS FOR HIGH BLOOD PRESSURE

COMPARISON BETWEEN PHARMACOLOGICAL AND NATURAL TREATMENTS FOR ARTERIAL HYPERTENSION

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SUMMARY:

Hypertension is a widely prevalent chronic condition and one of the main risk factors for cardiovascular diseases, such as myocardial infarction and stroke. Its treatment traditionally involves the use of medications, such as ACE inhibitors and beta-blockers, which are effective in rapidly controlling blood pressure. However, these treatments can have adverse effects, such as hyperkalemia and bradycardia, which compromise long-term adherence in some patients. In parallel, natural interventions, such as the DASH diet and regular physical activity, have gained attention for presenting long-lasting efficacy and fewer adverse effects. This study aims to conduct an integrative review, comparing pharmacological approaches with natural interventions in the control of arterial hypertension. The search was carried out in the PubMed database, resulting in the selection of six relevant articles published between 2019 and 2024. Data analysis shows that, although pharmacological treatments are effective in immediate control, natural interventions offer advantages in terms of safety and long-term adherence. The combination of both approaches appears to be a promising strategy, providing an effective reduction in blood pressure and minimizing the risks of cardiovascular complications. This study highlights the importance of personalizing the treatment of arterial hypertension based on the individual characteristics of each patient, combining strategies that maximize benefits and minimize risks.

Keywords: Adherence to treatment. Blood pressure control. Diet. Pharmacotherapy. Arterial hypertension.

ABSTRACT:

Arterial hypertension is a prevalent chronic condition and one of the leading risk factors for cardiovascular diseases, such as myocardial infarction and stroke. Its treatment traditionally involves the use of medications like ACE inhibitors and beta-blockers, which are effective in quickly controlling blood pressure. However, these treatments can present adverse effects, such as hyperkalemia and bradycardia, compromising long-term adherence in some patients. Simultaneously, natural interventions, such as the DASH diet and regular physical activity, have gained attention for providing sustained efficacy with fewer adverse effects. This study aims to conduct an integrative review comparing pharmacological approaches with natural interventions in the management of arterial hypertension. The research was carried out in the PubMed database, resulting in the selection of six relevant articles published between 2019 and 2024. Data analysis shows that while pharmacological treatments are effective for

immediate control, natural interventions offer advantages in terms of safety and long-term adherence. The combination of both approaches emerges as a promising strategy, providing effective blood pressure reduction while minimizing the risks of cardiovascular complications. This study highlights the importance of personalizing hypertension management based on individual patient characteristics, combining strategies that maximize benefits and minimize risks.

Keywords: Blood Pressure Control. Diet. Hypertension. Pharmacotherapy. Treatment Adherence.

1. INTRODUCTION

Hypertension (HT) is a highly prevalent chronic condition worldwide and is one of the main risk factors for cardiovascular diseases, such as myocardial infarction and stroke. Its association with serious complications makes adequate control of blood pressure levels essential, especially in populations with a predisposition to chronic diseases (Villafuerte*et al.*, 2020). Pharmacological treatments, such as angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), and beta-blockers, are widely used and recommended in international guidelines for the management of hypertension, especially in patients with moderate to severe hypertension (Wilkinson*et al.*, 2020). However, prolonged use of these medications is associated with adverse effects, such as hyperkalemia, cough, and bradycardia, which can negatively impact treatment adherence (Zhang*et al.*, 2023).

In parallel, non-pharmacological interventions, such as lifestyle changes, have been widely investigated as alternatives or complements to pharmacological treatments. The DASH (Dietary Approaches to Stop Hypertension) diet, which emphasizes reducing sodium and increasing the intake of fruits, vegetables and low-fat dairy products, has been shown to be effective in reducing blood pressure levels, in addition to providing additional benefits to cardiovascular health (Blumenthal*et al.*, 2021). Furthermore, regular physical activity has shown positive results in controlling blood pressure, being a widely accepted recommendation for hypertensive patients, especially those with mild to moderate hypertension (Shamsi*et al.*, 2021).

Combining pharmacological therapies with natural interventions is often suggested as the ideal approach for patients with resistant or difficult-to-control hypertension. Recent studies indicate that integrating lifestyle changes with the use of medications may result in greater effectiveness in controlling blood pressure and minimizing adverse effects related to prolonged drug use (Castilla-Ojo *et al.*, 2023).

The aim of this study is to compare the effectiveness of pharmacological treatments and natural interventions in controlling arterial hypertension, with the aim of identifying the benefits, challenges and limitations of each approach. In addition, we seek to evaluate the impact of these interventions on treatment adherence and on reducing the risks of long-term cardiovascular complications. Finally, we intend to analyze the possibility of integrating pharmacological treatments and natural interventions as a more effective strategy for managing arterial hypertension.

2. MATERIAL AND METHOD

This study was conducted through an integrative literature review, using the PubMed database to identify studies that compared the efficacy and safety of pharmacological treatments and natural interventions in the management of arterial hypertension. The search was performed using the following search key: "('hypertension' OR 'high blood pressure') AND ('pharmacological treatment' OR 'antihypertensive drugs') AND ('natural treatment' OR 'diet' OR 'herbal' OR 'lifestyle intervention')", with the aim of exploring recent studies that discussed therapeutic approaches based on medications and non-pharmacological interventions, such as diet and exercise.

Studies published between 2019 and 2024, written in English or Portuguese, were included in the review. The focus of the selection was randomized clinical trials, systematic reviews, and observational studies that addressed the direct comparison between pharmacological treatments and natural interventions. The inclusion criteria also required that the studies be conducted in adult populations, defined as individuals aged 18 years or older. Articles that did not present direct comparisons between the

two types of treatment, as well as studies without access to the full text or those focused on pediatric or pregnant populations.

The initial search in the PubMed database resulted in 17,846 articles. After applying filters related to year of publication, type of study and language, 172 studies were selected for initial screening of titles and abstracts. After removing duplicates and reading the abstracts, 17 articles were selected for full reading. Of these, 6 were included in this integrative review. Table 1 summarizes the information on the selected articles, including the main topics addressed in each of them.

Table 1. Works included.

Base	**Title**	**Authors**	**Periodical (vol, no, page, year)**	**Considerations Themes**
PubMed	Effects of Lifestyle Modification on Patients With Resistant Hypertension: Results of the TRIUMPH Randomized Clinical Trial.	BLUMENTHAL, ALREADY*et al.*	**Circulation**, v.144, p.1212-1226, 2021	Effect of the modifications node lifestyle in patients with hypertension resistant
PubMed	Effects of the DASH diet and losartan on serum urate among adults with hypertension: Results of the randomized trial.	CASTILLA-EYE, N.*et al.*	**J Clin Hypertens**, v.25, p.915-922, 2023	Comparison between the DASH diet and the use of losartan in control from the blood pressure and of uric acid

PubMed	Impact of lifestyle interventions on reducing diet sodium intake and blood pressure in patients with hypertension: THE randomized controlled trial.	SHAMSI, S.A.*et al*.	**Turk Kardiyol dern Ars**, v.49, p.143-149, 2021	Impact of the interventions node lifestyle and reduction from the sodium intake in control of blood pressure
PubMed	Effectiveness of a multifactorial intervention, consisting of self-management of antihypertensive medication, self-measurement of blood pressure, hypocaloric and low sodium diet, and physical exercise, in patients with uncontrolled hypertension taking 2 or more antihypertensive drugs: The MEDICHY study.	VILLAFLUERTE, Unda*et al*.	**Medicine (Baltimore)**, v.99, p.19769, 2020	Study on the impact of one intervention multifactorial in patients with hypertension resistant

PubMed	Ten Hours Time-Restricted Eating Reduces Weight, Blood Pressure, and Atherogenic Lipids in Patients with Metabolic Syndrome.	WILKINSON, M. J. *et al.*	**Cell Metab.**, v.31, p.92-104, 2020	Assessment from the effectiveness of fasting intermittent in weight loss and blood pressure in patients with syndrome metabolic
PubMed	Effects of blood pressure and antihypertensive drugs on osteoarthritis: the Mendelian randomized study.	ZHANG, Y. *et al.*	**Aging Clin Exp Res.**, v.35, p.2437-2444, 2023	Assessment of impact of the medicines antihypertensives in patients with osteoarthritis

Source: own authorship, 2024.

3. RESULTS AND DISCUSSION

Pharmacological treatments continue to be the basis for the management of arterial hypertension, especially in patients with moderate to severe or resistant hypertension. Recent studies indicate that medications such as angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs) and beta-blockers are effective in reducing blood pressure levels in various patient profiles, mainly due to their direct impact on the renin-angiotensin-aldosterone system (RAAS), one of the main mechanisms regulating blood pressure (Villafuerte *et al.*, 2020; Zhang *et al.*, 2023). However, adverse effects related to prolonged use of such drugs, such as chronic cough, hyperkalemia and bradycardia, limit their long-term adherence, especially in elderly patients or those with multiple comorbidities (Wilkinson *et al.*, 2020).

In the context of natural interventions, the reviewed literature suggests that approaches such as the DASH (Dietary Approaches to Stop Hypertension) diet and regular exercise are effective in controlling blood pressure, especially in cases of mild to moderate hypertension. These interventions are based on reducing sodium intake, increasing potassium intake and improving the lipid profile, contributing to an overall improvement in cardiovascular health (Blumenthal *et al.*, 2021; Wang *et al.*, 2022). In addition, studies that analyzed regular exercise have shown that physical activity helps reduce peripheral vascular resistance and improves the elasticity of the arteries, which contributes to a sustained reduction in blood pressure (Shamsi *et al.*, 2021).

Combining pharmacological treatments with natural approaches, such as lifestyle modification, is emerging as an effective strategy, especially for patients with resistant hypertension. Analysis of studies comparing these two approaches indicates that the introduction of non-pharmacological interventions can reduce dependence on higher doses of medication, which in turn minimizes the incidence of adverse effects and improves therapeutic adherence (Castilla-Ojo *et al.*, 2023). A multifactorial approach, involving self-monitoring of blood pressure, a low-sodium diet, and physical exercise, has been shown to be effective in long-term control of hypertension, as evidenced in recent studies (Blumenthal *et al.*, 2021).

Furthermore, it was observed that, in patients who strictly adhered to these lifestyle changes, the reduction in blood pressure levels was accompanied by an improvement in the general metabolic profile, with a reduction in blood glucose and serum lipid levels, which reinforces the effectiveness of these non-pharmacological interventions as adjuvants in the treatment of hypertension (Wang *et al.*, 2022). However, it is important to emphasize that adherence to natural interventions requires a high degree of commitment on the part of patients, something that is not always easily achieved. Significant behavioral changes, such as drastically reducing sodium in the diet, can be challenging, which can compromise long-term results (Shamsi *et al.*, 2021).

In patients with resistant or difficult-to-control hypertension, the combination of pharmacological and natural treatments appears to be the most effective strategy. Evidence suggests that patients who follow a multifactorial treatment plan have better outcomes

results compared to those following only an isolated pharmacological regimen (Villafuerte *et al.*, 2020). This integrated approach not only promotes immediate blood pressure reduction but also helps maintain this control in the long term, minimizing the risk of serious cardiovascular complications. The synergy between these approaches is essential to maximize therapeutic benefits and reduce the risks associated with prolonged use of medications, especially in patients with multiple comorbidities (Blumenthal *et al.*, 2021).

FINAL CONSIDERATIONS

Pharmacological treatments for arterial hypertension have been shown to be effective in rapidly controlling blood pressure levels, especially in patients with severe hypertension or associated comorbidities. However, adverse effects associated with these medications, such as hyperkalemia and bradycardia, may compromise long-term adherence, especially in more vulnerable populations (Villafuerte *et al.*, 2020; Wilkinson *et al.*, 2020). On the other hand, natural interventions, such as the DASH diet and regular exercise, have been shown to be effective in reducing blood pressure levels in the long term, in addition to providing a series of additional benefits to cardiovascular health and the general well-being of patients (Blumenthal *et al.*, 2021; Shamsi *et al.*, 2021).

However, the effectiveness of natural interventions depends heavily on patient adherence, which can be challenging in contexts where there is resistance to behavioral change. The combination of both pharmacological and natural approaches emerges as a promising alternative, integrating the immediate control of hypertension provided by medications with the sustainable benefits of lifestyle changes (Castilla-Ojo *et al.*, 2023). Adopting this hybrid strategy can reduce the need for high doses of drugs, thus minimizing the incidence of serious adverse effects and increasing the quality of life of hypertensive patients (Blumenthal *et al.*, 2021).

Therefore, the choice of treatment for arterial hypertension must be individualized, taking into account the specific characteristics of each patient, the presence of comorbidities and adherence to treatment. The integration of pharmacological interventions with lifestyle changes offers the most effective perspective for controlling hypertension

long term, promoting not only the reduction of blood pressure levels, but also the prevention of cardiovascular complications and the improvement of the general health of patients (Villafuerte *et al.*, 2020).

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