

Herbal Plants for Lowering Blood Pressure in Hypertension Patients at UPTD WKJ Tegal

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| Article Info | ABSTRACT |
|--|---|
| <p>Keywords: Herbal plants Herbs for hypertension <i>Apium graveolens</i> <i>Orthosiphon aristatus</i>.</p> | <p>Hypertension is a major risk factor for cardiovascular diseases, including atherosclerosis, heart failure, kidney failure, and stroke. The long-term use of chemical medications poses the risk of side effects that may damage certain organ functions. Thus, alternative therapies are needed to reduce dependence on medication and help maintain the quality of life of hypertensive patients. One alternative treatment that can be considered for lowering blood pressure is herbal therapy. The herbal plants examined in this literature study are <i>Orthosiphon aristatus</i> and celery. <i>Orthosiphon aristatus</i> contains apigenin compounds that act as diuretics, while celery contains flavonoids that work by dilating blood vessels, allowing blood to flow more freely and thereby reducing blood pressure. Research objective to identify herbal plants and their active compounds used as hypertension therapy based on prescriptions at UPTD WKJ Tegal. The research method used is a literature study developed based on prescriptions for hypertension patients at UPTD WKJ Tegal. According to the journal findings on celery leaves, the difference in blood pressure before and after administration of celery leaf decoction was measured. The average difference (mean) in diastolic blood pressure was 11.33 mmHg, and the difference in systolic blood pressure was 8.67 mmHg. This indicates a significant reduction in blood pressure after administering celery leaf decoction for five consecutive days. In the study on <i>Orthosiphon aristatus</i> leaves, the frequency of urination in elderly patients before administration of <i>Orthosiphon aristatus</i> infusion was 3.00 times (range 2–6). After administering the infusion once daily for seven consecutive days, the frequency increased to 6.00 times (range 3–9), with an average difference of 2.2 times in urination frequency. This demonstrates that the infusion of <i>Orthosiphon aristatus</i> leaves has a diuretic effect on elderly hypertensive patients. Celery (<i>Apium graveolens</i>) and <i>Orthosiphon aristatus</i> herbal plants have been shown to effectively reduce blood pressure in patients with hypertension</p> |
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INTRODUCTION

The term hypertension originates from the Latin words "hyper" and "tension." "Hyper" means excessive or extraordinary, while "tension" refers to strain or pressure. Thus, hypertension is interpreted as extraordinary tension, commonly known as high blood pressure (Kultsum et.al, 2019). Hypertension is a condition characterized by a chronic (long-term) increase in blood pressure that can cause disease complications and may lead to death (Ainurafiq et.al, 2019). If left untreated, this condition can impair the function of vital organs such as the heart and kidneys. Therefore, hypertension is a major risk factor for cardiovascular diseases including atherosclerosis, heart failure, kidney failure, and stroke (Azima et al., 2023). This occurs because the heart must work harder to pump blood in order to meet the body's oxygen and nutrient demands (Ainurafiq et.al, 2019). Hypertension is often referred to as the "Silent Killer" because many hypertensive patients do not show any signs or symptoms, leading them to be unaware that they have been suffering from high blood pressure for years (Azima et al., 2023).

Several risk factors contribute to the development of hypertension, including obesity and age. As age increases, the risk of high blood pressure also rises. This is evidenced by the prevalence of hypertension in the elderly reaching 40%, along with a high mortality rate around the age of 65 (Azima et al., 2023). Environmental and behavioral factors, as well as racial and ethnic differences, are major contributors to the high prevalence of hypertension. In addition, modifiable risk factors such as high sodium intake, low potassium intake, alcohol consumption, obesity, lack of physical activity, and unhealthy dietary patterns also play a role in increasing the risk of hypertension. A person is considered hypertensive when the systolic blood pressure reaches >140 mmHg and diastolic pressure exceeds >90 mmHg (Rahmadhani, 2021).

Hypertension treatment is a suppressive therapy, meaning the treatment is aimed only at reducing the risk of long-term mortality and morbidity, so hypertension therapy may need to be continued lifelong. To manage hypertension, both blood pressure control and prevention of complications are necessary. Hypertension can be managed through various therapies, including non-pharmacological therapy (such as efforts to reduce body weight and limiting salt intake to no more than 0.5 teaspoons per day), pharmacological therapy (by consuming anti-hypertensive drugs), and the use of effective herbal therapies (utilizing natural ingredients, for example medicinal plants that have been clinically or preclinically tested) (Khumaira et al., 2023).

The long-term use of chemical drugs can cause side effects on health, such as hypersensitivity reactions, including allergies, itching, and upper respiratory tract infections. Therefore, the community is increasingly interested in using herbal remedies for hypertension therapy as a preventive measure against the long-term side effects of chemical drugs. Long before the use of conventional medicine, the Indonesian people had already been using *jamu* to treat illnesses. *Jamu* is a traditional Indonesian herbal medicine, which in recent times is referred to as herbal remedies. *Jamu* consists of various natural ingredients traditionally prepared to strengthen the immune system, prevent diseases, and cure illnesses (Khumaira et al., 2023).

Based on the Ministry of Health Regulation No. 003/MENKES/PER/II/2010 concerning the scientific validation of *jamu*, the efficacy and safety of *jamu* have been established. The scientific validation of *jamu* is an effort to prove the efficacy and safety of *jamu* through research based on healthcare services, as an initiative by the Ministry of Health. Once the efficacy and safety of *jamu* are confirmed, it is expected that *jamu* can be used in formal healthcare services (Triyono et al., 2018). The *jamu* scientific validation program aims to conduct further research on the use of *jamu* in the community. Scientific *jamu* refers to *jamu* that has passed efficacy and toxicity tests, making it safe for long-term consumption (Prasuma et al., 2024).

Tegal Regency has the potential to realize community health services based on traditional herbal medicine. With existing facilities and resources, the Tegal government has designed a concept for traditional *jamu* health services integrated with tourism, education, and health programs called the UPTD WKJ Tegal. Approximately 245 types of medicinal plants are cultivated in the yard of the Wisata Kesehatan Jamu Kalibakung. This tourist attraction receives visitors ranging from kindergarten students to *jamu* diploma III internship students and pharmacy professionals. Wisata Kesehatan Kalibakung provides treatment using dried herbal simplicia (Hapsari, Woro, Risnanto, Salamah, 2023).

METHODS

This study is a non-experimental research with a descriptive research design. The descriptive method is used to describe or provide an overview of the object being studied based on a sample or population. This research was conducted from January 29 to February 14, 2024, at UPTD WKJ Kalibakung, Balapulung, Tegal Regency, Central Java Province.

RESULTS AND DISCUSSION

Observations were conducted on 10 patient prescriptions at UPTD Wisata Kesehatan Jamu Tegal who were diagnosed with high blood pressure or hypertension. The patient characteristics are presented in the following table:

| No | Characteristics of Respondents | Total | Percentase |
|----|--|-------|------------|
| 1 | Gender: | | |
| | Male | 5 | 50 % |
| | Female | 5 | 50 % |
| 2 | Age | | |
| | 50-60 year | 7 | 70 % |
| | >60 year | 3 | 30 % |
| 3 | Medicinal Plants: | | |
| | <i>Orthosiphon aristatus</i> (Cat's Whiskers) and <i>Apium graveolens</i> (Celery) | 10 | 100 % |

The gender distribution of hypertensive patients at UPTD Wisata Kesehatan Jamu Tegal is equally proportioned between males and females. Research conducted at the Hortus Medicus Herbal Research House (RRJ) showed that the majority of patients by gender were

female, totaling 59 individuals (61.5%), while males accounted for 37 individuals (38.5%) (Arib et al., 2019). This may be due to females experiencing menopause, a condition characterized by hormonal changes, specifically a decrease in the ratio of estrogen to androgen, which leads to increased renin release and consequently can trigger an increase in blood pressure (Coylewright et al., 2008).

The overall age characteristics of patients show that most are over 50 years old, with 30% being elderly patients. Herbal medicine in the form of decoction is preferred by the elderly (Arib et al., 2019). This preference is due to the unpleasant taste of the herbal decoction and the impracticality of the preparation process.

The natural ingredients used for hypertension treatment at UPTD WKJ Tegal are celery and cat's whiskers. Celery is a medicinal plant that is consistently prescribed to hypertensive patients at UPTD WKJ Tegal (100%). The chemical compounds in celery that exhibit antihypertensive activity include apigenin and n-butylphthalide, which act as calcium antagonists and therefore have a vasodilatory effect (Tashakori-Sabvezar et al., 2016). In another study, apigenin was reported to have antihypertensive activity through an antioxidant mechanism, which inhibits enzymes responsible for the formation of reactive oxygen species (ROS), thereby reducing oxidative damage in tissues and helping to normalize vascular tension (Lugasi et al., 2003). In addition, dichloromethane and ethyl acetate extracts of celery have been shown to possess vasorelaxant activity (Jorge et al., 2013).

The second plant that is consistently prescribed for hypertensive patients at UPTD WKJ Tegal is cat's whiskers (*Orthosiphon aristatus*), with a prescription rate of 100%. In *in vivo* studies, aqueous extracts of cat's whiskers leaves have demonstrated blood pressure-lowering effects (Azizan et al., 2012; Ohashi et al., 2000). Diuretics can reduce cardiac workload, oxygen demand, and plasma volume (Roopesh et al., 2011). Additionally, both ethanol and aqueous extracts of cat's whiskers leaves have shown immunomodulatory activity (Alshawsh et al., 2012).

CONCLUSION

Celery (*Apium graveolens*) and *Orthosiphon aristatus* herbal plants have been shown to effectively reduce blood pressure in patients with hypertension

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