



The Potential of *Andrographis paniculata* as a Supplement for the Management of Benign Prostate Hypertrophy (BPH): A Systematic Literature Review

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ABSTRACT

Andrographis paniculata has been studied for their potential protective action on benign prostate hypertrophy (BPH). This polyphenol has been reported to repair the antioxidant defense mechanisms in the prostate, reduce inflammation, and inhibit IGF-I and IGF-II. *Andrographis paniculata* has been studied for its potential protective action on benign prostate hypertrophy (BPH) and its ability to reduce inflammation in the prostate. This study aimed to explore various scientific evidence related to the exploration of the potential of *Andrographis paniculata* in the management of benign prostate hypertrophy (BPH). These three studies consistently present data demonstrating the superiority of andrographolide isolate in the apoptosis initiation of prostate cells. Increased apoptosis of prostate cells is believed to cause a decrease in the mass of prostate tissues and organs. The decrease in prostate mass will relieve pressure on the urethral canal and will eliminate complaints of difficulty urinating in patients with BPH. In conclusion, *Andrographis paniculata* has the potential to supplementation in the management of benign prostate hypertrophy through regulation of prostate cell apoptosis initiation.

1. Introduction

Benign prostate hypertrophy is a non-cancerous enlargement of the prostate gland. It's a common condition in men over the age of 50 and can cause symptoms such as frequent urination, difficulty starting or stopping urination, and a weak urine stream. Treatment options include medication and surgery. Approximately 50-80% of men over the age of 50 have benign prostate hypertrophy. Benign prostate hypertrophy can also lead to bladder and kidney problems if left untreated. Early detection and treatment can help reduce the risk of complications. Regular check-ups with a doctor are recommended for men over the age of 50. In addition, lifestyle changes such as reducing alcohol and caffeine intake and

reducing stress can help manage symptoms of benign prostate hypertrophy. Exercise and a healthy diet can also help reduce the risk of developing the condition.¹⁻⁵

Benign prostate hypertrophy treatment may include medications such as alpha-blockers or 5-alpha reductase inhibitors. Surgery may also be used to treat an enlarged prostate. In some cases, lifestyle changes such as reducing caffeine and alcohol consumption may help to reduce prostate enlargement. However, there are potential risks and side effects associated with medications and surgery. These risks and side effects should be discussed with a doctor before any treatment is started. Additionally, it is not clear that lifestyle changes will actually help

to reduce prostate enlargement. More research is needed in this area. Lifestyle changes may also include improving diet, exercising regularly, and getting sufficient rest. These changes may help to improve overall health and well-being. However, the effectiveness of these lifestyle changes in treating prostate enlargement is not known. Therefore, further exploration into new modality therapies for prostate enlargement is necessary in order to determine if there are any effective treatments that can help to reduce the enlargement of the prostate. The potential of herbal remedies for treating prostate enlargement is an area of research that is gaining traction in recent years. Herbal remedies may provide a safe alternative to medications and surgery, and studies have indicated that certain herbs may be effective in reducing the symptoms of prostate enlargement.⁶⁻¹⁰

Andrographis paniculata is an herb found in tropical areas of Asia, and it has been used in traditional medicine for centuries. It has been studied for its potential benefits for things like reducing inflammation, reducing fever, and boosting the immune system. *Andrographis paniculata* contains secondary metabolites such as diterpenoids, flavonoids, and phenolic compounds, which have been studied for their potential health benefits. Flavonoids, such as those found in *Andrographis paniculata*, have been studied for their potential protective action on benign prostate hypertrophy (BPH). This polyphenol has been reported to repair the antioxidant defense mechanisms in the prostate, reduce inflammation, and inhibit IGF-I and IGF-II. *Andrographis paniculata* has been studied for its potential protective action on benign prostate hypertrophy (BPH) and its ability to reduce inflammation in the prostate. The flavonoids found in *Andrographis paniculata* have been shown to inhibit IGF-I and IGF-II, two hormones that are involved in the growth of cells in the prostate. Additionally, they have been found to repair the body's antioxidant defense mechanisms and reduce inflammation in the prostate, which can help reduce the size of BPH and improve prostate health.¹¹⁻¹⁵ This study aimed to explore various scientific evidence

related to the exploration of the potential of *Andrographis paniculata* in the management of benign prostate hypertrophy (BPH).

2. Methods

The literature search process was carried out on various databases (PubMed, Web of Sciences, EMBASE, Cochrane Libraries, and Google Scholar) regarding the potential of *Andrographis paniculata* to prevent the severity of benign prostate hypertrophy. The search was performed using the terms: (1) "*Andrographis paniculata*" OR "flavonoid" OR "benign prostate hypertrophy" OR "Andrographis paniculata effect on benign prostate hypertrophy" AND (2) "*Andrographis paniculata*" OR "andrographolide." The literature is limited to preclinical studies and published in English. The literature selection criteria are articles published in the form of original articles, an experimental model of benign prostate hypertrophy, the control group only received liquid without therapeutic effect or no treatment, studies were conducted in a timeframe from 2013-2023, and the main outcome was the apoptosis of the prostate cell. Meanwhile, the exclusion criteria were animal models that were not related to benign prostate hypertrophy, the application of *Andrographis paniculata* with other treatments, the absence of a control group, and duplication of publications. This study follows the preferred reporting items for systematic reviews and meta-analysis (PRISMA) recommendations.

3. Results and Discussion

Table 1 presents the characteristics of the studies included in this systematic review. There were three studies included in this systematic review. The majority of studies used the isolate of *Andrographis paniculata*, andrographolide. Andrographolide is a diterpenoid lactone, chemically composed of a four-membered ring with three carbons and one oxygen and a five-membered ring with four carbons and one oxygen. Andrographolide has been found to have anti-inflammatory, anti-diabetic, anti-tumor, and anti-

oxidative activities and has been studied for its potential role in preventing the progression of prostate cancer. The majority of studies are in vitro studies using prostatic cell lines. All three studies demonstrated the potential of andrographolide isolates in the initiation of apoptosis of prostate cells. All three studies consistently present data demonstrating the superiority of andrographolide isolate in the initiation

of apoptosis of prostate cells. The increase in prostate cell apoptosis is believed to cause a decrease in the mass of prostate tissue and organs. The decrease in prostate mass will relieve pressure on the urethral canal and will eliminate complaints of difficulty urinating in sufferers of BPH.¹⁶⁻¹⁸

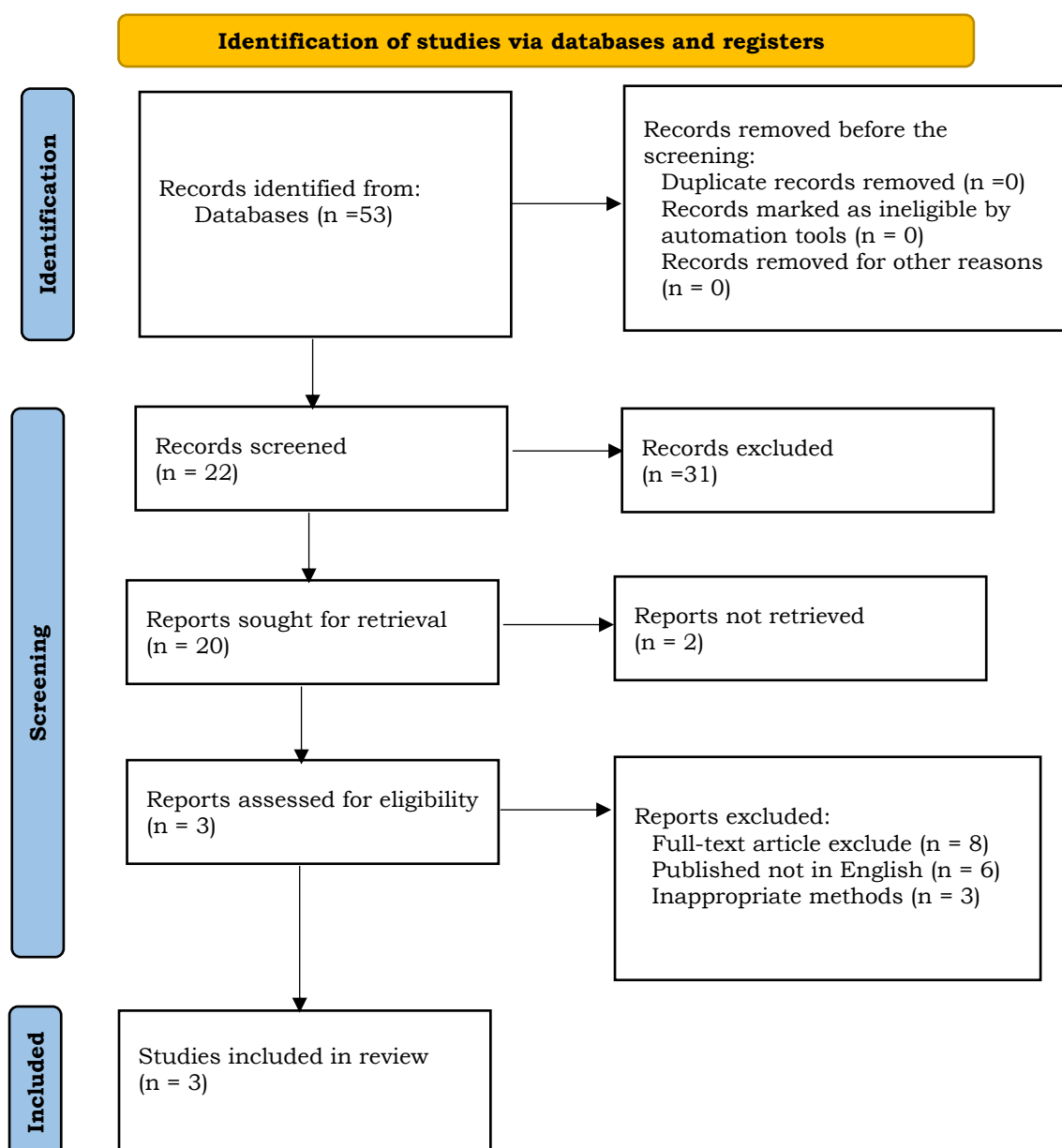


Figure 1. Research PRISMA diagram.

Table 1. Study characteristics.

Study	Preparation of <i>Andrographis paniculata</i>	Design study	Cell type	Method of administration	Placebo	Outcome apoptosis cell (%) vs placebo
Xia et al. ²³	Isolation	In vitro	Prostatic cell line	In vitro	PBS	78.5±3.3 VS 26.9±2.3
Kim et al. ¹⁴	Isolation	In vitro	Prostatic cell line	In vitro	PBS	83.2±2.5 VS 35.7±3.1
Chun et al. ²⁵	Isolation	In vitro	Prostatic cell line	In vitro	PBS	71.6±2.6 VS 31.2±2.9

Andrographolide has been found to induce apoptosis in prostate cancer cells by activating the mitochondrial apoptotic pathway and upregulating the expression of pro-apoptotic proteins. In addition, it has been found to inhibit the proliferation of prostate cancer cells by inhibiting the activity of certain enzymes and signaling pathways that are involved in cell growth.¹⁹ Furthermore, it has been shown to activate the expression of certain tumor suppressor genes, which can help suppress the growth and spread of cancer cells.²⁰ This is likely due to the anti-inflammatory and antioxidant properties of the compound, which can help reduce oxidative stress and reduce inflammation that can lead to the development of cancer.²¹ Additionally, the compound can help reduce the production of certain proteins that are involved in cell growth and proliferation, which can help reduce the spread of cancer cells. The compound has also been shown to have anti-angiogenic properties, meaning it can prevent the formation of new blood vessels that can feed and sustain tumors. This is especially beneficial for certain types of cancer, such as breast cancer, as it can help reduce the spread of cancer cells and reduce the risk of metastasis.²² When tumors form, they need blood vessels to supply them with the nutrients they need to grow. By preventing the formation of new blood vessels, the compound can limit the tumor's ability to grow and spread, potentially leading to better outcomes for people with cancer. In addition, andrographolide has been shown to reduce the expression of androgen receptors in prostate cancer cells, which prevents the cells from responding to androgens and stimulates cell death. It has also been found to inhibit tumor growth

and induce anti-inflammatory responses, which further contributes to its anti-cancer effects. Furthermore, andrographolide has been demonstrated to inhibit the growth and spread of prostate cancer to other parts of the body. Andrographolide has also been found to reduce the expression of anti-apoptotic proteins, which further promotes apoptosis of prostate cancer cells. Moreover, it has been reported to weaken the migration and invasion of prostate cancer cells.²³⁻²⁶

4. Conclusion

Andrographis paniculata has the potential as a supplementation in the management of benign prostate hypertrophy through the regulation of prostate cell apoptosis initiation.

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