Characteristics of BPH Patients with Finasteride therapy in Essential Hypertension Patients – a systematic review

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KEYWORDS

benign prostatic hyperplasia, finasteride, essential hypertension, systematic review

ABSTRACT

Background

Benign prostatic hyperplasia (BPH) is not life threatening, but it is linked to developing cardiovascular diseases, sleep disturbances, mental health issues, sexual dysfunction, and others. Individuals with BPH also experience comorbidities that are associated with the ageing process such as cardiovascular disease (67.7%), hyperlipidemia (57.2%), and hypertension (54.4%). Therapeutic interventions can be employed based on the seriousness of symptoms while patients suffering from moderate to severe symptoms might use medicinal care as a treatment such as 5-alpha reductase inhibitors (finasteride). The use of finasteride is commonly associated with decrease in sexual desire, erectile dysfunction, reduced volume of ejaculate, gynecomastia, and orthostatic hypotension. No research has been conducted on the impact of using finasteride to patients with benign prostatic hyperplasia (BPH) who also have essential hypertension. The use of finasteride as a treatment for BPH might affect individuals with essential hypertension.

Objective

To examine the specific characteristics of patients with benign prostatic hyperplasia (BPH) who undergo finasteride therapy in individuals with essential hypertension.

Methods

This research employs a systematic review and Meta-analysis (PRISMA). The systematic review procedure involves thorough preparation and sequencing, distinguishing it significantly from methods that merely provide literature studies. A targeted search is conducted using databases like Google Scholar, Science Direct, PMC, and Springer Link, using keywords such as "benign prostate hyperplasia", "hypertension", and "finasteride". A total of 8,042 journal articles meet the evaluation criteria.

Results

Three trials had active controls. The trials of 282 patients received finasteride 5 mg over 3–48 months. Over 48 months finasteride produced greater characteristic patient improvements in blood pressure, prostate volume, and side effect of therapy. Significantly more sexual dysfunction, impotence, ejaculation disorder and decreased libido occurred with finasteride at 12 months; the NNH for any sexual dysfunction at 12 months was 14. There is a lack information that finasteride therapy effect blood pressure in benign prostatic hyperplasia patient with hypertension so more research is needed.

Conclusion

Our study showed that the use of finasteride resulted in a drop in blood pressure and prostate volume. However, it was also associated with an increase in side effects including sexual dysfunction, impotence, ejaculation disorder, and decreased desire. Further research is needed to fully understand the impact of these factors on individuals with benign prostatic hyperplasia who also have hypertension.

Introduction

Benign prostatic hyperplasia (BPH) is the term used to describe the benign enlargement or excessive growth of prostate tissue. It has been discovered that the occurrence of BPH tends to rise as individuals get older. The histological incidence of BPH during postmortem examination is as high as 50% to 60% for males in their 60s, and it increases to 80% to 90% for those who are older than 70 years of age (Ng et al., 2024). While benign prostatic hyperplasia (BPH) may not pose a direct threat to life, it is linked to a higher likelihood of developing cardiovascular diseases. Additionally, BPH is connected to sleep disturbances, mental health issues, sexual dysfunction, and various other ailments (Shao et al., 2023).

Research and empirical evidence demonstrate that the treatment approach for benign prostatic hyperplasia (BPH) differs based on the severity of symptoms, which can be classified as mild, moderate, or severe (Franco et al., 2023). Patients with mild signs may benefit from applying a watchful waiting approach and making modifications to their lifestyles. Engaging in physical activity has the potential to alleviate the symptoms of prostatism (Silva et al., 2019). Patients suffering from moderate to severe symptoms might choose medicinal care as a treatment approach. This may involve the use of alpha blockers, 5-alpha reductase inhibitors (5-ARI), and phosphodiesterase inhibitors (PDE-Is) (Gwon et al., 2023).

Therapeutic interventions that can be employed based on the seriousness of symptoms included Transurethral resection of the prostate (TURP) (Miernik & Gratzke, 2020). TURP is considered the gold standard surgical procedure, but there are also new therapeutic options such as laser-based procedures like HoLEP and ThuLEP, as well as robotic water jets known as Aquablation. These alternatives are designed to minimise complications that may occur after surgery (Franco et al., 2023). Regardless of whether the therapies administered are invasive or not, they can induce various adverse effects. Finasteride, a medication classified as a 5 alpha reductase inhibitor, is commonly used as a therapy known to cause certain negative effects (Zito et al., 2024).

Finasteride is commonly associated with several negative effects, including a decrease in sexual desire, erectile dysfunction (occurring in 2% to 4% of cases), reduced volume of ejaculate, gynecomastia, and orthostatic hypotension (Fertig et al., 2017; O'Quin et al., 2023). Additional studies indicate that prolonged usage of 5-alpha reductase inhibitors, such as finasteride and dutasteride, may be linked to several health hazards, including non-alcoholic fatty liver disorders (NAFLD), insulin resistance (IR), type 2 diabetes (T2DM), dry eye disease, and probable renal dysfunction (Traish, 2020). This should be a matter of concern, as individuals with BPH also experience comorbidities that are associated with the ageing process. At the index date, the most common comorbidities were cardiovascular disease (67.7%), hyperlipidemia (57.2%), and hypertension (54.4%) (Del Giudice et al., 2023).

The majority of hypertension cases are idiopathic, which is also referred to as essential hypertension (Iqbal & Jamal, 2023). Hypertension is responsible for slightly more than 20% of the population's risk for cardiovascular diseases (Yusuf et al., 2020). It is also the primary cause of about 10 million deaths and 218 million cases of disability-adjusted life-years worldwide (Stanaway et al., 2018). Furthermore, the worldwide old population is seeing a higher pace of growth in comparison to the overall population. On top of that, the prevalence of hypertension and cardiovascular risk factors also markedly rises with advancing age (Egan et al., 2024). Despite the presence of comorbidities, no research has been conducted on the impact of administering finasteride to patients with benign prostatic hyperplasia (BPH) who also have essential hypertension.

Thus, considering the aforementioned factors, the use of finasteride as a treatment for BPH might affect individuals with essential hypertension. This study aims to examine the specific attributes of patients with benign prostatic hyperplasia (BPH) who undergo finasteride therapy in individuals with essential hypertension. The review will aim to address the inquiries regarding participants, interventions, comparators, and outcomes (PICO).

Methods

This research employs a systematic review approach following the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines (Figure 1). This method is systematically executed, adhering to correct research steps and protocols. A systematic review is a method that classifies and categorises previously generated evidence through a structured series of evaluation, review, and classification. The systematic review procedure involves thorough preparation and sequencing, distinguishing it significantly from methods that merely provide literature studies.

The systematic review comprises the following stages: 1) Developing the Background and Objectives of the Study; 2) Identification of problems; 3) Data search; 4) Screening / Selection Criteria; and 5) Quality Assessment. 6) Data synthesis. For inclusion criteria, we considered 1) journals published between 2019-2024, with 2) research articles focusing on the characteristics of BPH and hypertension patients treated by finasteride, 3) the independent variable studied in these articles is finasteride, and 4) only articles indexed by Scopus were included.

Conversely, exclusion criteria involved 1) articles with incomplete texts, 2) those not published in journals, or 3) not addressing the specified dependent variables. Additionally, 4) articles that couldn't be accessed in their entirety were excluded from consideration.

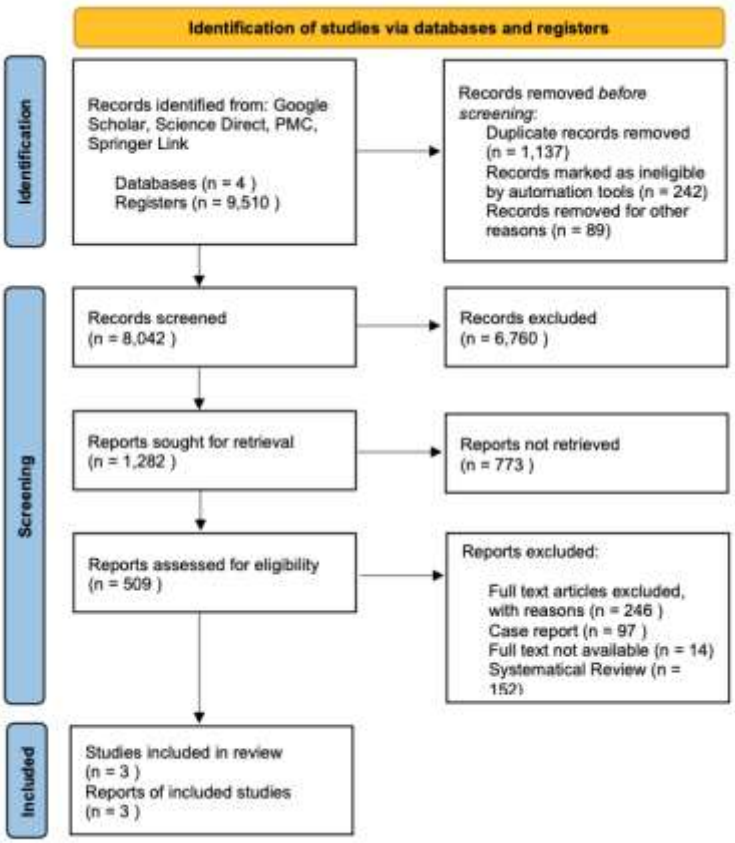

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement of the systematic review.

Development of Background and Objectives:
The initial step involves defining the background and study objectives. In this study, the focus is on understanding the characteristics of patients with benign prostate hyperplasia (BPH) and hypertension who are treated with finasteride.

Identification of Problems:
Existing research journals are examined to identify issues related to BPH and hypertension patients treated with finasteride.

Data Search:
A targeted search is conducted using databases like Google Scholar, Science Direct, PMC, and Springer Link, using keywords such as "benign prostate hyperplasia", "hypertension", and "finasteride". This search yielded 9,510 journal articles.

Screening/Selection Criteria:

The retrieved literature undergoes a rigorous filtering process based on specific criteria. Only articles published between 2019 and 2024 and indexed by Scopus within various quartiles are considered. The focus is on articles directly relevant to investigating the characteristics of BPH and hypertension patients.

Quality Assessment:
Inclusion and exclusion criteria are based on the quality of the studies, including whether they were published within the specified timeframe. A total of 8,042 journal articles meet the evaluation criteria. Relevant data is then extracted from these selected articles.

Data Synthesis:
Findings are summarised using either a narrative or meta-analysis technique. The narrative method is chosen for its ability to effectively organise and present accumulated facts. Primary materials are carefully reviewed, and data from research publications are utilised to align findings with the research objectives.

Results

These publications identified potential randomised trials of finasteride in the treatment of benign prostatic hyperplasia. Some of these are duplicated publications, with or without references to previous publications. Full details of related studies are also included, with male descriptions included, study duration, results, and results shown in the file. Finasteride 5 mg daily was assessed in all included trials, although some also included finasteride 1 mg or 10 mg. One trial collected information from 282 men given finasteride; This information is included in the analysis described below. (Kattih et al., 2019)

In a controlled trial, a total of 282 men were given finasteride 5 mg therapy given once a day with an age range of subjects 50-89 years. Among them, there were 282 patients who were monitored with a history of hypertension. The male subjects included in the trial had a clinical diagnosis of benign prostatic hyperplasia, based largely on symptoms and urine flow rate. (Kattih et al., 2019) For symptoms, for example the American Urological Association's symptom rating scale uses seven questions that can be graded from 0 (no problem) to 5 (severe problem); The scale can be from 0 to 35, divided into mild (0-7 points), moderate (8-19 points) or severe (20-35 points) diseases. At baseline, moderate to severe symptoms in 17 trials, and in two studies men with mild symptoms were included. Common exceptions in the trials were men with possible prostate cancer, urinary tract infections, previous prostate surgery, hematuria, or those who only needed bladder catheterization for acute urinary retention. (Bauer et al., 2021)

Included trial summary, prostate size by randomization process, quality of life, duration, intensity of treatment (based on randomised process. Prostate size varied from 282 male subjects. The largest trial with a monitoring duration of at least 12 months. Most of the larger trials showed a significant advantage on recession prostate size with administration of finasteride 5 mg over placebo at $p < 0.01$ for symptom score, maximum urine flow rate and prostate volume; A notable exception was the VA Cooperative study, which included symptom scores and maximum urine flow rate, including men with small prostates as inclusion criteria for the study. (Bauer et al., 2021)(Kattih et al., 2019)

Three different grading systems are used. In placebo-controlled trials, the Boyarsky scale (0-54) was used in two studies, the modified Boyarsky scale (0-36) in nine, and the American Urological Association (AUA; 0-35, similar to the current International Prostate Symptom Score, IPSS) in eight; Higher scores indicate worse symptoms on all three scales. The severity of symptoms was noted at baseline and at various stages during the study, although not all studies reported this information for all time points, including baseline. (Bauer et al., 2021). The other research has shown that total severity symptom scores were similar at baseline with finasteride (17) and placebo (16). These subjects then improved, and with a duration of 12 months there was a reduction in volume greater than size and in symptom reduction with finasteride administration then therapy was maintained for 24 to 48 months. Scores continued to decline with finasteride for up to 48 months, whereas those began to improve with placebo after 18 months.(Bauer et al., 2021)

Blood pressure

There have been no studies that state the decrease in blood pressure observed after single therapy of finasteride either in the duration range of 3 months, 6 months, 12 months, or 18 months, administration of finasteride together with selective alpha-1 adrenoceptor antagonists drugs will increase blood pressure reduction by <1 to 3% with details, administration with terazosin (3.4%), doxazosin (2.3%), tamsulosin (<1%), and alfuzosin (2.3%). (Halawani et al., 2023) (Kattih et al., 2019)

Prostate volume

Results for prostate volume which decreased by 25% over 24 months with finasteride therapy compared to placebo which only fell by 4%. At baseline, the average measured prostate volume was 43.7 cm3 in BPH patients with hypertension to be treated with finasteride (282 men). The size of the prostate recession occurs with the duration of administration of finasteride therapy. The duration of monitoring 24 months decreased prostate volume to 32.7 cm3 with finasteride therapy. A prostate volume of 30 cm3 or less is generally assumed to be a normal measure in older men and is not associated with prostatic hyperplasia. (Halawani et al., 2023) (Kattih et al., 2019)

Side effects

The most commonly reported side effects are impotence, decreased libido, and ejaculatory disorders in men. The definition of this side effect is generally not given in trials. Because cumulative side effect information is not available after the first year in some studies because it takes a long time for symptoms to appear. Serious side effects occurred at the same frequency as finasteride therapy (12%; 34/282 men). (Halawani et al., 2023) (Kattih et al., 2019)

Side Effect	Finasteride	Placebo
Any drug related event	36%	34.9%
Erectile disfunction	8.1%	3.7%
Decreased of libido	6.4%	3.4%

Loss of libido	-	-
Decreased semen volume	3.7%	0.8%
New type 2 diabetes	-	-
Gynaecomastia	0.5%	0.1%
Cardiac failure	-	-
Psychiatric	-	-
Prostate cancer	24.8% relative risk reduction over 7 years. High risk: increased risk (6.4% vs. 5.1%)	

Discussion

BPH is a condition that causes disturbances in the micturition process. BPH often occurs in old age men. If not treated properly, there may be a complication process in the type of urinary tract obstruction that requires invasive management. Currently, finasteride is one of the methods used to treat BPH. The use of finasteride has been shown to reduce the risk of worsening BPH. Side effects of finasteride use are quite rare, but in men who use finasteride can increase the risk of impotence, erectile disorders, decreased libido, and ejaculation disorders. Finasteride also has effects on blood pressure. (Tacklind, J. et al., 2010)

This systematic review showed no blood pressure reduction effect in patients with a history of hypertension taking finasteride alone or in combination for up to 18 months. The use of finasteride in patients with comorbid hypertension also did not show the common side effects such as impotence, decreased libido, and ejaculation disorders. This may be due to the duration of patient follow-up only being conducted for 18 months. The use of finasteride in patients with comorbid hypertension did not interfere with its effectiveness in reducing BPH disease progression. The use of finasteride compared to placebo had a volume difference of 25% in 24 months. (Halawani et al., 2023) (Kattih et al., 2019)(Bauer et al., 2021)

Conclusion

Benign prostatic hyperplasia (BPH) is a non-life-threatening condition linked to cardiovascular diseases, sleep disturbances, mental health issues, and sexual dysfunction. It is often treated with 5-alpha reductase inhibitors (finasteride), which is associated with decreased sexual desire, erectile dysfunction, reduced ejaculate volume, gynecomastia, and orthostatic hypotension. Research suggests that administration of finasteride together with selective alpha-1 adrenoceptor antagonists drugs will increase blood pressure reduction during treatment. Our research showed that finasteride reduced blood pressure, prostate volume, but increased side effects such as sexual dysfunction, impotence, ejaculation disorder, and decreased libido. Further research is needed to understand its effects on BPH patients with hypertension.

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Tables

Table 1. Descriptive Statistics

Journal Title and Researcher Name	Objective	Population / Sample	Instrument	Data Analysis / Research Methods	Results
Anti-androgenic therapy with finasteride in patients with chronic heart failure - a retrospective propensity score based analysis Badder Kattih Lukas Simon Elling Christel Weiss Marieke Bea Carolin Zwadlo Udo Bavendiek Johann Bauersachs Joerg Heineke	Anti-androgenic therapy with finasteride was associated with attenuated cardiac hypertrophy in patients with heart failure.	1041 medical cases witjh heart failure, 868 with tamsulosin only, 178 finasteride with or without tamsulosin.	1041 medical cases witjh heart failure, 868 with tamsulosin only, 178 finasteride with or without tamsulosin.	Randomised Cohort Retrospective	Patients in the treatment group were on average about 2 years older compared to those in the control group ($p = 0.006$) and had a significant higher prevalence of cardiovascular risk factors (history of smoking 45.7% vs. 33.5% ($p = 0.002$) and hypertension 83.8% vs. 75.6% ($p = 0.019$)) and a lower body mass index 25.8 vs. 27.1 kg/m² ($p < 0.001$). Aspirin and statins were more frequently prescribed in the control group (55.9% vs. 46.2% ($p = 0.020$) and 70.4% vs. 58.4% ($p = 0.002$)).
Risks and side effects in the medical management of benign prostatic hyperplasia Abdulghafour Halawani Ryan Paterson Tianshuang Zhong Katie Du Runhan Ren Connor M. Forbes	To provides a contemporary overview of risks and side effects in the medical management of BPH	97 research articles, literature reviews, interview questions.	Related literature.	Literature review.	Report of the side effect of darious drugs therapies.

Assessment of Frailty and Association With Progression of Benign Prostatic Hyperplasia Symptoms and Serious Adverse Events Among Men Using Drug Therapy Scott R. Bauer, MD, ScM Louise C. Walter, MD Kristine E. Ensrud, MD Anne M. Suskind, MD, MS John C. Newman, MD, PhD William A. Ricke, PhD Teresa T. Liu, PhD Kevin T. McVary, MD Kenneth Covinsky, MD	To assess the association between a deficit accumulation frailty index and clinical BPH progression or SAE.	Medical Therapy of Prostatic Symptoms trial, which compared placebo, doxazosin, finasteride, and combination therapy in men with moderate-to-severe LUTS, reduced urinary flow rate, and no prior BPH interventions, hypotension, or elevated prostate-specific antigen	Health records of the subject.	Cohort study.	Among 3047 men (mean [SD] age, 62.6 [7.3] years; range, 50-89 years) in this analysis, 745 (24%) were robust, 1824 (60%) were prefrail, and 478 (16%) were frail at baseline. Compared with robust men, frail men were older (age 75 years, 12 men [2%] vs 62 men [13%]), less likely to be White (646 men [87%] vs 344 men [72%]), less likely to be married (599 men [80%] vs 342 men [72%]), and less likely to have 16 years or more of education (471 men [63%] vs 150 men [31%]). During mean (SD) follow-up of 4.0 (1.5) years, the incidence rate of clinical BPH progression was 2.2 events per 100 person-years among robust men, 2.9 events per 100 person-years among prefrail men (AHR, 1.36; 95% CI, 1.02-1.83), and 4.0 events per 100 person-years among frail men (AHR, 1.82; 95% CI, 1.24-2.67; linear P = .005). Larger point estimates were seen among men who received doxazosin or combination therapy, although the test for interaction between frailty index and treatment group

					did not reach statistical significance (P for interaction = .06). Risk of SAE was higher among prefrail and frail men (prefrail vs robust AHR, 1.81; 95% CI, 1.48-2.23; frail vs robust AHR, 2.86; 95% CI, 2.21-3.69; linear P < .001); this association was similar across treatment groups (P for interaction = .76).