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Review

Interactions between medications employed in treating benign prostatic hyperplasia and food – A short review

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ABSTRACT

Benign prostatic hyperplasia (BPH) is the most common disease in elderly men. BPH symptoms include frequent urination, urgent tenesmus and urination at night, a weak and interrupted urine flow and a sense of incomplete emptying of the bladder. Alpha- 1 adrenergic receptor antagonists and 5 α-reductase inhibitors form the most important groups of medications employed in BPH. Appropriately managed BPH patients shall be subject to counselling on interactions between agents belonging to these groups, and on particular components of the food they have.

The present review has been aimed at assessing potential effects of consumed food, alcohol and fruit juices on the pharmacokinetics and pharmacodynamics of medications for benign prostatic hyperplasia.

The authors reviewed the English PubMed database covering the years 1991–2015. Additionally, a digital version of Stockley Drugs Interaction and other electronic databases such as drugs.com and Medscape were also researched; characterisation charts for particular medical products were also analyzed.

Pharmacokinetics of extended-release forms of alfuzosin, doxazosin, tamsulosin and silodosin is well known to be food-sensitive. Alfuzosin, tamsulosin and silodosin due to their likely interaction with grapefruit juice and citrus fruits, may intensify adverse effects of the drugs. Alpha-1 adrenergic receptor antagonists are known to interact with alcohol, leading to orthostatic hypotension. For 5 alpha-reductase inhibitors, such as finasteride, or dutasteride, the pharmacokinetic effect due to consumed food is of no clinical importance and thus they may be taken regardless of meals.

As in general grapefruit juice and alcohol tend to significantly affect the efficacy and safety of the applied drug therapy, it is highly advisable to be knowledgeable on the subject in order to educate patients.

Contents

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1. Introduction

Benign prostatic hyperplasia (BPH) is the most common condition in elderly men. From the histopathological viewpoint, prostatic lesions are associated with hyperplasia of the epithelial cells and stroma. Such hyperplasia contributes to enlargement of the gland itself [1]. Symptoms of BPH include frequent urination, urgent tenesmus and urination at night, a weak and interrupted urine flow, and a sense of incomplete voiding of the bladder [2]. The 'watchful waiting' strategy and yearly monitoring of the progress of disease in patients who score 0–7 points, out of 35, in the questionnaire is recommended to assess severity of their symptoms [3]. Appropriately to their clinical condition, patients with moderate or severe symptoms should be subjected to pharmacotherapy or surgery [4]. Alpha-1 adrenergic receptor antagonists and 5 α-reductase inhibitors [2] provide the two most important groups of medications employed in BPH. Alpha-adrenergic receptor antagonists constitute a group of pharmaceuticals that cause smooth muscle relaxation in the prostate. The effects of the therapy may be seen as early as in 3–5 days. Their most common adverse effects include dizziness, fatigue, orthostatic hypotension, retrograde ejaculation, nasal mucosal edema and headaches [2]. 5 α-reductase (5-AR) inhibitors inhibit testosterone to dihydrotestosterone conversion. The principal and functionally active androgen dihydrotestosterone (DHT) is synthesized from testosterone by 5-AR types 1 and 2. Due to inhibition of 5-AR, DHT levels in the prostate decline. As DHT is an important player in the processes leading to prostate growth, the gland shrinks [5]. The effects of treatment, however, are pronounced not sooner than within 4–6 months from starting the therapy. Their adverse effects include diminished libido and gynecomastia [2,3]. In patients with grossly enlarged prostate glands, a combination therapy may be recommended [2]. Effective pharmaceutical management includes patients education on pharmacotherapy, which should also cover information on interactions between the medications taken and particular food components they consume. Appropriate medications administration schemes also affect therapy effectiveness, often contributing to reduced treatment costs. Certain drugs-food components combinations, or drug-alcohol combinations, may also improve patient safety [6,7]. Unfortunately, in contrast to drug–drug interaction data, pharmacoepidemiological and pharmacoeconomical data on consequence of food–drug interactions are not fully recognised [8]. Heuberger [9] revealed several reasons to it, including measurement difficulties, troublesome obtaining appropriate samples, undefined framework study, as well as low interest in research that stems from a general failure to acknowledge the importance of the problem, its clinical significance, cost, and the overall impact on the population.

In view of the high BPH incidence in the population of elderly males, the potential effects of food, alcohol and fruit juice on the pharmacokinetics and pharmacodynamics of medications employed in treating the disease shall be finally given proper consideration.

2. Methods

In order to collect information on interactions between food and medications employed in BPH, the authors searched the PubMed database to review the literature published in English

Table 1
Interactions between medications employed in BPH with food and alcohol, and recommended modes of their taking.

DRUG	INTERACTION WITH MEALS AND ALCOHOL	RECOMMENDATIONS
Alfuzosin	• Food results in an increase in drug absorption by approximately 50% (extender-release forms). • Potential interaction with grapefruit juice. • Alcohol may potentiate the hypotensive effect of the drug.	• Drug in the form of extended-release tablets should be taken immediately after a meal. • Exercise caution while drinking grapefruit juice during therapy. • Restricting intake of alcohol or total abstinence is recommended.
Doxazosin	• Food results in a significant increase of C_{max} and AUC (extended-release forms). • Food may improve tolerance of the drug. • Alcohol may potentiate the hypotensive effect of the drug.	• Drug in the form of extended-release tablets should be taken immediately after a meal. • Restricting intake of alcohol or total abstinence is recommended.
Silodosin	• Administration of the drug with food leads to avoidance of high concentration of the medication (C_{max}), what may potentially limit adverse effect of the therapy. • Potential interaction with grapefruit juice.	• Drug to be taken during a meal. • Exercise caution while drinking grapefruit juice during therapy.
Tamsulozin	• Administration of the drug with food leads to decelerated absorption of tamsulozin (modified-release form), what restricts adverse effects of therapy. • Meals do not affects bioavailability of tamsulozin in the form of oral controlled absorption system OCAS. • Potential interaction with grapefruit juice. • Alcohol may potentiate the hypotensive affect of the drug.	• Modified-release tablets should be taken immediately after a meal. • Tamsulozin in the OCAS form may be taken with or without meals. • Exercise caution while consuming grapefruit juice during therapy (clinical effect of low significance). • Restricting intake of alcohol or total abstinence is recommended.
Terazosin	• Alcohol may potentiate the hypotensive affect of the drug.	• Medication to be taken irrespectively of meals. • Restricting intake of alcohol or total abstinence is recommended.
Finasteride	• Data unavailable.	• Medication to be taken irrespectively of meals.
Dutasteride	• Data unavailable.	• Medication to be taken irrespectively of meals.