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Case Report: Angiotensin converting enzyme inhibitors vs. angiotensin receptor blockers in the management of chronic hypertension: a case of lisinopril-induced rhinorrhea

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A 47-year-old woman presents to our clinic with a chief complaint of rhinorrhea; she had chronic hypertension managed with four antihypertensive drugs, including an ACE inhibitor. While dry cough is a well-known side effect associated with ACE inhibitors, this case highlights a common chief complaint yet less recognized side effect of ACE inhibitors and further emphasizes the idea that overall, angiotensin receptor blockers may be a better drug of choice in hypertension due to their favorable side effect profile.

KEYWORDS

angiotensin converting enzyme inhibitors (ACE-I), angiotensin receptor blocker (ARB), hypertension, lisinopril, rhinorrhea

Introduction

Lisinopril, an ACE inhibitor, effectively manages hypertension but can cause side effects such as dry cough which is well known and upper respiratory symptoms. There is ongoing debate about whether to continue using ACE inhibitors, given the comparable effectiveness of ARBs and their favorable tolerability. This case emphasizes the importance of considering alternative treatments, such as ARBs, in patients intolerant to ACE inhibitors.

Case presentation

A 47-year-old woman with medical problems, including chronic hypertension, bipolar disorder, and substance use disorder, on methadone who presented to our clinic with a history of five years of runny nose, which she found extremely bothersome. The patient denied other symptoms such as cough, fever, facial pain, sneezing, polyps, pruritus, headaches, conjunctivitis, or sore throat. Her physical exam, including chest and EENT (Eyes, ear, nose, and throat), was unremarkable except for an erythema area from frequent nose squeezing.

Further questioning revealed that she had a sister with chronic hypertension who had rhinorrhea and nasal congestion that began a few weeks after starting lisinopril. She was evaluated multiple times at urgent care for nasal congestion with rhinorrhea with no clear

etiology and provided only supportive treatment, including nasal decongestants. After several office visits by her sister's new primary care physician, on her first visit, was able to relate the beginning of her symptoms to the time around the lisinopril prescription. Hence, lisinopril was switched to losartan, after which her symptoms completely resolved. The patient also reported a similar history with her father, who experienced flushing and upper respiratory symptoms after starting lisinopril.

Treatment & outcome

Given her strong family history and no indication for further labs, our treatment plan was to substitute lisinopril with losartan and review her case in 2 weeks. She was amenable to the treatment and followed through with her prescription, and 2-weeks later, she reported a significant improvement in her rhinorrhea and a complete resolution of her symptoms in 4 weeks.

Discussion

Lisinopril belongs to a class of medications called ACE inhibitors used in the management of hypertension, heart failure, and diabetic nephropathy. While it is a relatively safe and efficacious drug, its side effects include dry cough (1, 2), angioedema (3–5), acute kidney injury (6), hyperkalemia (7), and oro-esophageal pemphigus (8, 9). It works by inhibiting the conversion of angiotensin I to angiotensin II to regulate blood pressure. Lisinopril may result in the accumulation of bradykinin and substance P, which increases vascular permeability and leakage of fluid from blood vessels into the surrounding tissues.

In the upper respiratory tract, this later mechanism is thought to mediate symptoms like reported postnasal drainage, rhinitis, and rhinorrhea (10, 11). Even though the exact incidence of such reported cases is unknown, there usually lies a diagnostic challenge as potential etiologies may fall under allergic, non-allergic, or both (10, 12–14). Upper respiratory tract-related illness is among the three top diagnoses in outpatient settings in the USA, and having a broad differential is crucial in providing the standard of care patients deserve and avoiding unnecessary diagnostic testing.

ACE inhibitor-induced cough is widely known by most clinicians. However, being aware of common yet less frequently recognized ACE inhibitor-induced upper respiratory symptoms such as nasal blockage, rhinitis, or postnasal drainage is essential. It is important to note that not everyone using ACE-Is will experience rhinorrhea or upper respiratory symptoms, and some studies suggest a genetic predisposition, which could have been the case for our patient, given her strong family history (15). The severity of this side effect can vary among individuals.

Also, with the increasing prevalence of hypertension (16–20), notwithstanding the decreased morbidity and mortality with ACE-I use (21), there is an ongoing debate in the research community, as well as clinical trials on whether or not to keep using ACE-Is especially since ARBs are reasonably comparable in effectiveness and may be a favorable choice in terms of tolerability and strong evidence for end-organ protection (22–25).

In summary, upper respiratory tract symptoms, including rhinorrhea, are common presenting symptoms in the outpatient, and this case highlights the importance of having a broad differential. Based on ongoing clinical evidence, we favor the use of ARBs over ACE-Is when indicated in the management of hypertension and renal disease, more so in patients who are intolerant to ACE inhibitors.

Patient perspective

The Patient was appreciative of the medication change. Her symptoms resolved and she stated that “I feel that someone actually listened to me. Thank you. Doctor”.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

Ethics statement

Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

AA: Writing – original draft, Writing – review & editing. GS: Writing – review & editing. XV: Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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