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Angiotensin Converting Enzyme Inhibitors and Sartans in a Geriatric Setting: Impact of Therapeutic Interchange

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Abstract

Background: Therapeutic interchange is widely used in geriatric settings, such as angiotensin enzyme converting inhibitors and angiotensin II receptor antagonists and angiotensin receptor blockers (sartans).

Objective: we evaluate the clinical impact (efficacy and tolerance) of a therapeutic interchange program for non-complicated hypertension.

Method: 13 patients receiving angiotensin enzyme converting inhibitors and 7 patients under sartans were followed-up during 6 months after a therapeutic interchange to a first line drug: Ramipril and valsartan, respectively.

Results: all the substitutions were well tolerated and no significant difference was observed for diastolic and systolic pressure after therapeutic interchange.

Conclusion: therapeutic interchange on angiotensin enzyme converting inhibitors and sartans in the context of hypertension seem safe based on our clinical data.

Keywords: Therapeutic interchange; Angiotensin enzyme converting inhibitors; Angiotensin II receptor antagonists and angiotensin receptor blockers (sartans); Geriatric setting

Introduction

Substitution treatment or "therapeutic interchange" (TI) is one of the most important tasks of the hospital pharmacist. It consists of converting, if possible, the patient's prescription to treatments referenced in the new clinical setting [1]. This important pharmacoeconomic practice [2] must ensure clinical efficacy and safety of the new treatment and must be based on scientific data [3]. Therapeutic interchange is widely used in hospitals around the world; this practice has developed even more since the exponential development of "me-too" drugs in many pharmacologic classes [2]. In France, especially in small geriatric hospitals, automatic TI for proton-pump inhibitors, statins or cardiovascular treatments are often done when the patient is admitted in the new clinical setting. These practices also seem safe since the patient will stay in the geriatric clinic for the rest of his life and will not be confronted to another substitution of his treatment.

The programs of automatic TI are often described as cost savings solutions and useful inventory stocking issues or processing time [4], but they could also have thought to be safe by optimizing prescriber's knowledges about a limited number of drugs for current and non-complicated clinical situations and in turn a potential key for limiting medication errors.

Substitution of cardiovascular treatment is often difficult to implement in hospital settings [5,6]. However, if caution appears legitimate for certain therapeutic classes such as beta-blockers, other classes such as angiotensin enzyme converting (AEC) inhibitors or sartans (also called Angiotensin II receptor antagonists and angiotensin receptor blockers (ARBs) are pharmacologically homogeneous groups and how different molecules are potential substitutable [4,7,8]. This approach could appear particularly safe if this substitution is offered to patients in the long term, like in geriatric care.

We report data on the impact of substitutions of AEC inhibitors and ARBs. We present the cardiovascular monitoring of 15 patients receiving ACE inhibitors and 9 patients receiving ARBs who had their previous therapy substituted respectively with ramipril and valsartan dosage adjustments.

Materials and Methods

Substitution was proposed to our patients in an interview with the patient's physician. This procedure was applied in cases of hypertension without gravity problems. A comparison of diastolic arterial pressure (DAP) and systolic (SAP) was carried out before and 6 months after the date of the substitution (comparisons by Student's t test on paired measurements), dosage changes and major cardiovascular events (stroke, myocardial infarction and vascular death) were also identified.

Results

The substitution of the prior to AEC inhibitor to ramipril did not significantly alter the DAP (p=0.92, t=0.11) and SAP (p=0.94, t=0.76). Similarly, the substitution of the prior ARB to valsartan did not significantly alter the DAP (p=0.47, t=0.75) and SAP (p=0.13, t=1.68). See these results in Figures 1 and 2.
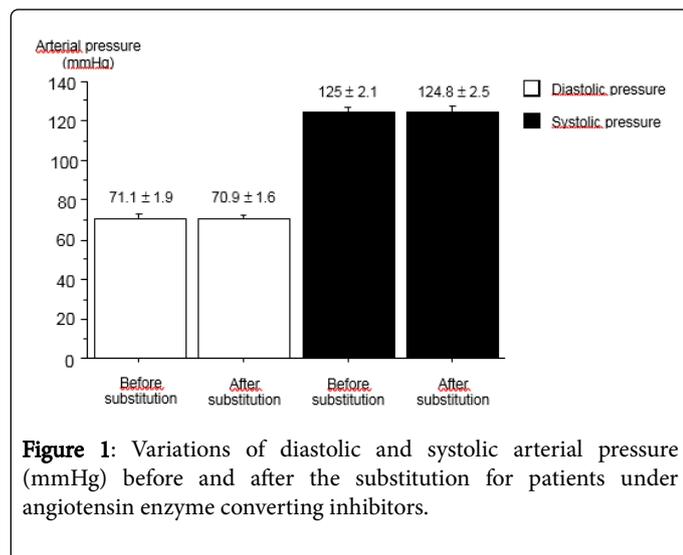
Figure 1: Variations of diastolic and systolic arterial pressure (mmHg) before and after the substitution for patients under angiotensin enzyme converting inhibitors.
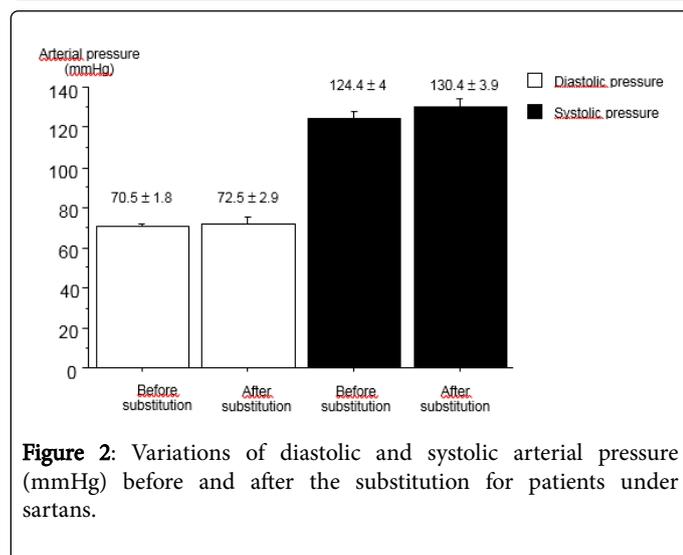
Figure 2: Variations of diastolic and systolic arterial pressure (mmHg) before and after the substitution for patients under sartans.

Finally, no cardiovascular event was observed within 6 months following the substitution. After 6 months, 13 patients receiving ACE inhibitors and 7 patients under ARBs conserved the dose originally prescribed. Two patients receiving ACE inhibitors and one under sartan changed to an increased dosage of Ramipril and valsartan compared to the initial doses prescribed; in these cases, arterial pressure was stable after one month of treatment change. Finally, a patient who took sartan changed to reduced doses of this treatment.

Discussion

In France and in other countries, TI is a widely method, usually applied during the patient's admission. American pharmaceutical literature provided many studies that emphasis the dramatic increase of TI in the last thirty years [2]. In 1982, Doering et al. [9] noted that 31% of the hospitals allowed automatic TI, in 1996 and 1998, 75.5% and 84% of hospitals seem to use TI [10,11] and in 2002, 88%, 89% and 100% of teaching, nonteaching and investor-owned hospitals had respectively applied TI programs [2]. In this previous study, TI was used by 28%, 27% and 20% of teaching, nonteaching and investor-owned hospitals respectively for AEC inhibitors and by 11%, 14% and 15% of teaching, nonteaching and investor-owned hospitals respectively for ARBs [2]. Similar data is not available in France, but it highlights the importance of the evaluation of TI of these pharmacologic classes.

As part of our study, the substitution of AEC inhibitors seemed totally safe. These results are in line with those observed by Stoysich and Massoomi [4] who showed that the substitution of AEC inhibitors in 59 patients (automatically changedupon arrival at the hospital) did not change the DAP and SAP by comparing the measurements before and after the substitution (p=0.052 and p=0.141 respectively).

Substitution with ARBs resulted in a non-significant increase of arterial pressure (mainly SAP), which seems worth to be noted. Indeed, ACE inhibitors and ARBs have similar effects on hypertension and their adverse effects are also comparable. However, the occurrence of dry cough is more frequent with ACE inhibitors, whereas ARBs have in general a higher cost than IEC. Thus, the greater part of national guidelines recommends prescribing an ACE inhibitor as first-line drugs and ARBs in patients with ACE inhibitor dry cough [12-15]. In clinical practice, the use of ACE inhibitors as first-line drugs sometimes triggers the prescription of ARBs, when there is a poorly controlled hypertension with ACE inhibitors. Thus, although our sample population is small, the largest destabilization (although not significant) in SAP is found in patients under ARBs. This could be explained that these patients had a baseline hypertension more difficult to stabilize. Peris Marti et al. [7] assessed a TI interchange with ARBs and showed in 18 patients that blood pressures were similar before and after the interchange process, but two patients required an increased dose of the ARB.

These data need to be assessed in larger population samples in order to validate TI on ACE inhibitors and ARBs, which are commonly used in geriatric clinical settings.

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