Angiotensin-Converting Enzyme Inhibitors (ACE-Is) versus Angiotensin-Receptor Blockers (ARBs): Any superiority?

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It is well established that renin-angiotensin-aldosterone system (RAAS) blockade with angiotensin-converting enzyme inhibitors (ACE-Is) or angiotensin receptor blockers (ARBs) is beneficial in preventing or reversing endothelial dysfunction and atherosclerosis, thus preventing clinical endpoints such as cardiovascular mortality and morbidity, myocardial infarction and stroke [7,8]. ACE-Is and ARBs reduce end-organ damage in the heart, kidneys and brain [7,8]. Despite the different mechanisms of actions of ACE-Is and ARBs, both classes of medications have a blood pressure-lowering effect and both are appropriate for first-line therapy for diastolic and/or systolic hypertension [2]. Moreover, both ACE-Is and ARBs provide renovascular protection and are highly recommended as blood pressure medications in patients with kidney disease.

Except for the recent ONTARGET study (The Ongoing Telmisartan Alone in Combination with Ramipril Global Endpoint Trial) [3], no head-to-head comparisons of ACE-Is and ARBs existed to demonstrate the clinical superiority of one class than the other. Aside from the fact that ARBs were more costly than ACE-Is, clinical superiority was yet to be determined. The ONTARGET trial was able to compare an ACE-I (ramipril) with an ARB (telmisartan). This trial showed that ARBs were not inferior to ACE-Is in efficacy. Both ACE-Is and ARBs behaved similarly in preventing clinical endpoints such as myocardial infarction and stroke in high-risk patients. No difference between ramipril and telmisartan existed in their effect of syncpe and their increasing the rate of hyperkalemia [3,4,9]. On the other hand, ARBs had better tolerability profile compared to ACE-Is by their causing lower rates of cough and angioedema [3,4,9]. ARBs were more effective in blood pressure lowering than ACE-Is in the presence of [anti-angiotensin-receptor-1 (anti-AT1)] antibodies (usually present in sera of hypertensive patients) [6], but ARBs caused a higher rate of hypotensive symptoms.

It is worth mentioning at this point that the ONTARGET trial studied the impact of a combination therapy with an ACE-I (ramipril) and ARB (telmisartan) in high risk patients [5]. Combination therapy was associated with no added benefits, but rather was associated with more adverse events such as hypotension and syncope that caused a greater number of study discontinuations [5,9]. On the contrary, combination therapy using an ACE-I and an ARB was beneficial in reducing mortality and morbidity in chronic heart failure and high-risk diabetes patients [5,7].

In conclusion, despite the higher cost of ARBs than ACE-Is, the better tolerability profile of ARBs than ACE-Is in terms of lower cough rates and angioedema is likely in favour of ARB utilization.

References

5. White CM, Greene L (2011) Summary of AHRQ’s comparative effectiveness