

## Therapeutical Approach of Arterial Hypertension

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### Background

Arterial hypertension treatment is based upon all available evidence about the benefits of antihypertensive therapy and of different classes of therapeutic agents [1].

Applying antihypertensive treatment induces a significant decrease of cardiovascular morbidity and mortality. Treatment is associated with a major decrease of 30-40 % in the risk of stroke and also, with a decrease of coronary events of 20 % and an important decrease in heart failure [2-5].

### Content

When starting arterial hypertension therapy one should always consider blood pressure values and cardiovascular risk. All patients with arterial hypertension stage 2 or 3 must undergo treatment. There is still a cautious attitude over the benefits of treatment applied for hypertension stage. First measure for hypertension of all stages (1 to 3) should be lifestyle modification and based on arterial pressure values and cardiovascular risk, pharmacotherapy should follow. The main goal of treatment is to reduce long term cardiovascular risk. These peculiar effects have lower benefits than the protective dominant effect induced by arterial pressure decrease [6-9].

Several meta-analyses revealed that drug classes have different effects on heart failure occurrence. Diuretics and beta adrenergic antagonists, angiotensin converting enzyme inhibitors and angiotensin receptors blockers have a better action in preventing heart failure than calcium channel blockers, independently of blood pressure values [10-12].

Randomized trials that studied target organ damage have an increased value for medical practice. Studies on the effect of different drugs on ventricular hypertrophy showed that a decrease in blood pressure values generates a slower rate for the augmentation of ventricular mass, no matter the type of pharmacologic agents used. There was noticed the same efficiency for the angiotensin converting enzyme inhibitors, angiotensin receptors blockers and calcium channel blockers [13-17]. On concern to diuretics, studies ascertained indapamide's efficiency [18].

The best option for first line antihypertensive therapy seems to be: beta adrenergic antagonists, diuretics, calcium channel blockers, angiotensin converting enzyme inhibitors and angiotensin receptors blockers. These drugs may be used as monotherapy or as a combination. Each of the drug classes mentioned above may have specific characteristics, advantages and limits and they have to be adjusted to patient necessities. Beta-blockers offer protection against undesired coronary events and mortality, but are less efficient for protection against stroke—they are indicated in cases of: angina pectoris, heart failure and recent myocardial infarction. As side effects must be mentioned: potential weight gain, side effects on lipids metabolism and increase of diabetes type 2 prevalence. In conclusion beta-blockers should not be administrated to hypertensive patients with multiple metabolic risk factors as metabolic syndrome with abdominal obesity,

altered glycemia values, altered glucose tolerance. Thiazides diuretics also have a dismetabolic and diabetogenic effects. In exchange, vasodilator beta-blockers as carvedilol and nebivolol have a decreased or absent dismetabolic and diabetogenic action [19-23].

Antihypertensive drug classes have a different action on target organs damage. Angiotensin converting enzyme inhibitors and angiotensin receptors blockers have a high efficiency in reducing left ventricular hypertrophy; they also have good results in reducing microalbuminuria, proteinuria, in preserving renal function and preventing chronic renal disease [24-27]. Calcium channel blockers are efficient in reducing left ventricular hypertrophy and in slowing down coronary atherosclerosis progression. Studies revealed that, generally, therapy using a combination of drugs have a higher efficiency [28,29].

Drug classes have different types and frequency of side effects, and patients have a different behavior regarding side effects. Antihypertensive medication may influence distinguishly risk factors, target organs damage, specific cardiovascular events and provide specific protective action for different groups of patients. For this reason selection of drug combination should be based on certain circumstances. When choosing or avoiding a medication one should always take in consideration a series of factors: the experience (positive or negative) that a patient has with that medicine including the decrease of blood pressure values and side effects, the action of medication on cardiovascular risk factors (adjusted to each patient), target organs damage (cardiovascular disease, renal disease or diabetes mellitus should benefit of drugs that already proved to be efficient for this pathology), presence of some affections may limit the use of some drugs, avoiding interaction with other treatment that the patient follows and the cost-benefit rate [4,6,8,30].

Other principles that may be useful when starting antihypertensive therapy are: cost-benefit considerations should not be decisive for medication choice, long time action drugs should be preferred (they effectively decrease arterial pressure values), a simple therapy may increase patients compliance, but we must take in consideration how we may obtain a 24 hour efficient control.

One must always pay attention on avoiding or limiting side effects: for calcium channel antagonists, thiazides diuretics and beta-blockers is the dose dependence.

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When starting antihypertensive treatment: first it is indicated to use a single pharmacologic agent that must be administered in a low dose; if arterial pressure is not controlled we must increase the dose or change the drug class. A combination of 2 or more drugs is used in most studies; when combined the first drug as well as second one can be administered in lower doses, so that side effects are avoided and, in the same time, a good control of hypertension is achieved.

### Indication of using different classes of antihypertensive therapy

Angiotensin converting enzyme inhibitors: heart failure, left ventricular dysfunction, after myocardial infarction, diabetic nephropathy, left ventricular hypertrophy, carotids atherosclerosis, microalbuminuria, metabolic syndrome, atrial fibrillation.

Angiotensin receptors blockers: heart failure, after myocardial infarction, diabetic nephropathy, microalbuminuria, proteinuria, left ventricular hypertrophy, atrial fibrillation, metabolic syndrome.

Calcium channel antagonists: isolated systolic hypertension, angina pectoris, left ventricular hypertrophy, coronary atherosclerosis, pregnancy, supraventricular tachycardia.

**Beta-blockers:** Angina pectoris, after myocardial infarction, heart failure, tachyarrhythmia, glaucoma, pregnancy.

**Thiazides diuretics:** isolated systolic hypertension, heart failure.

**Loop diuretics:** heart failure, terminal renal/kidney disease.

A combination of drugs may be used: if drugs have different and complementary mechanism of action, there is efficiency on lowering blood pressure values, tolerance profile is good.

#### Possible combinations:

- Thiazides diuretic + angiotensin converting enzyme inhibitor
- Thiazides diuretic + angiotensin receptors blocker
- Calcium channel antagonist + angiotensin converting enzyme inhibitor
- Calcium channel antagonist + angiotensin receptors blocker
- Calcium channel antagonist + thiazides diuretic
- Beta-blocker + calcium channel antagonist [31-36].

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