



Drug information Center/KAUH

Does Carvedilol decrease Blood pressure more than Atenolol?

Atenolol:

Mechanism of action:

Atenolol competes with sympathomimetic neurotransmitters such as catecholamines for binding at beta (1)-adrenergic receptors in the heart and vascular smooth muscle, inhibiting sympathetic stimulation. This results in a reduction in resting heart rate, cardiac output, systolic and diastolic blood pressure, and reflex orthostatic hypotension. Higher doses of atenolol also competitively block beta (2)-adrenergic responses in the bronchial and vascular smooth muscles

Dosing in Hypertension:

Oral: 25-50 mg once daily, may increase to 100 mg/day. Doses >100 mg are unlikely to produce any further benefit.

Onset of action: Peak effect: Oral: 2-4 hours

Carvedilol:

Mechanism of action

Carvedilol is a multiple action adrenergic receptor blocker with α_1 , β_1 and β_2 adrenergic receptor blockade properties. Carvedilol has been shown to have organ-protective effects.

Carvedilol is a potent antioxidant and a scavenger of reactive oxygen radicals.

Carvedilol is Racemic, and both R (+) and S(-) enantiomers have the same α -adrenergic receptor blocking properties and antioxidant properties. Carvedilol has antiproliferative effects on human vascular smooth muscle cells.

A decrease in oxidative stress has been shown in clinical studies by measuring various markers during chronic treatment of patients with carvedilol .

Carvedilol's β -adrenergic receptor blocking properties are non-selective for the β_1 and β_2 Adrenoceptors and are associated with the laevorotatory S (-) enantiomer . Carvedilol has no intrinsic sympathomimetic activity and (like propranolol) it has membrane stabilising properties. Carvedilol suppresses the renin-angiotensin-aldosterone system through β -blockade, which reduces the release of renin, thus making fluid retention rare .

Dosing in Hypertension:

Immediate-release tablets:

Initial dose: 6.25 mg orally twice a day with food

Maintenance dose: 6.25 mg to 25 mg orally twice a day with food

Maximum dose: 50 mg per day

Extended-release capsules:

Initial dose: 20 mg orally once a day for 7 to 14 days. If tolerated, may increase dosage to 40 mg orally once a day, then again to 80 mg orally once a day after 7 to 14 days.

Maximum dose: 80 mg per day

Onset of action: 1-2 hours

Peak antihypertensive effect: ~1-2 hours

Study 1 :A comparison of carvedilol with atenolol in the treatment of mild-to-moderate essential hypertension.

The efficacy and safety of **Carvedilol**, a beta-blocker with vasodilating properties, were compared at a dosage of **25 to 50 mg once daily** with those of **Atenolol** at a dosage of **50-100 mg once daily** in a double-blind, randomized, parallel-group, multicenter study.

After a single-blind placebo phase of 3 to 6 weeks, **47 patients** (median age, 59 years) were randomized to receive **Carvedilol** and **52 patients** (median age, 57 years) were randomized to receive **Atenolol** for an 8-week study period. Patients on carvedilol received 12.5 mg for the first 2 days and then 25 mg as a once-daily dosage. The initial dosage of atenolol was 50 mg once daily. The dosage of each treatment could be doubled (to 50 and 100 mg once daily, respectively) at week 4 if the response was inadequate.

Sitting and standing blood pressures and heart rates were recorded 24 h after the dose at weeks 4 and 8. Data from 90 of 98 patients who completed the study were eligible for per-protocol analysis. Approximately one-third of the patients in each group required upward dose titration at week 4 because of inadequate response.

At week 8, 84% patients receiving carvedilol and 91% receiving atenolol had sitting diastolic blood pressure less than or equal to 90 mm Hg or decreased their blood pressure by greater than or equal to 10 mm Hg (**95% confidence intervals for difference between carvedilol and atenolol, +7% and -21%**). Safety profiles were similar between treatments. One patient withdrew; a skin rash developed during the fourth week of treatment with atenolol.

3 study 2: Comparison of a New Vasodilating β -Blocker, Carvedilol, With Atenolol in the Treatment of Mild to Moderate Essential Hypertension

After 8 weeks of treatment, response rates in the Carvedilol and atenolol treatment groups were 75% and 82%, respectively. Compared to baseline, the mean sitting blood pressure was significantly ($P < .05$) reduced by **Carvedilol** from 165/104 mm Hg to 147/89 mm Hg. With **Atenolol**, mean sitting blood pressure was significantly ($P < .05$) reduced from 167/104 mm Hg to 150/90 mm Hg. There was no statistically significant difference between the two treatments in the percentage of patients achieving a response or a normalized blood pressure or in the degree of change in mean sitting systolic or diastolic blood pressure..

Conclusion:

In patients with mild to moderate hypertension, there was No statistically significant difference between the efficacy of Carvedilol or atenolol with regard to the degree of reduction in blood pressure or the percentage of patients achieving a response to therapy. Carvedilol and atenolol were equally effective and well-tolerated.



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References:

1-lexi.comp

2- Young PH. A comparison of carvedilol with atenolol in the treatment of mild-to-moderate essential hypertension.

J Cardiovasc Pharmacol. 1992;19 Suppl 1:S82-5.

3- Ruilope LM. Comparison of a new vasodilating beta-blocker, carvedilol, with atenolol in the treatment of mild to moderate essential hypertension. Am J Hypertens. 1994 Feb;7(2):129-36.