

CILAZAPRIL-AFT

Cilazapril (BP) 1 mg, 2.5 mg and 5 mg film coated tablets

Presentation

Cilazapril-AFT 1 mg tablets are yellow, oval-shaped, biconvex tablets scored on one side and imprinted with "P" logo and 1 on the other side. Each tablet contains 1 mg cilazapril and typically weighs 134 mg.

Cilazapril-AFT 2.5 mg tablets are pinkish-brown, oval-shaped, biconvex tablets scored on one side and imprinted with "P" logo and "2.5" on the other side. Each tablet contains 2.5 mg cilazapril and typically weighs 206 mg.

Cilazapril-AFT 5 mg tablets are reddish-brown, oval-shaped biconvex tablets scored on one side and imprinted with "P" logo and "5" on the other side. Each tablet contains 5 mg cilazapril and typically weighs 206 mg.

Uses

Actions

Cilazapril is a specific, long-acting angiotensin-converting enzyme (ACE) inhibitor which suppresses the renin-angiotensin-aldosterone system and thereby the conversion of the inactive angiotensin I to angiotensin II, which is a potent vasoconstrictor. At recommended doses, the effect of cilazapril in hypertensive patients and in patients with congestive heart failure is maintained for up to 24 hours.

In patients with normal renal function, serum potassium usually remains within the normal range during cilazapril treatment. In patients concomitantly taking potassium-sparing diuretics, potassium levels may rise (see *Warnings and Precautions and Interactions*).

Hypertension

Cilazapril induces a reduction of both supine and standing systolic and diastolic blood pressure, usually with no orthostatic component. It is effective in all degrees of essential hypertension as well as in renal hypertension. The antihypertensive effect of cilazapril is usually apparent within the first hour after administration, with maximum effect observed between 3 and 7 hours after dosing. In general, the heart rate remains unchanged. Reflex tachycardia is not induced, although small, clinically insignificant alterations of heart rate may occur. In some patients blood pressure reduction may diminish towards the end of the dosage interval.

The antihypertensive effect of cilazapril is maintained during long-term therapy. No rapid increase in blood pressure has been observed after abrupt withdrawal of cilazapril.

In hypertensive patients with moderate to severe renal impairment, the glomerular filtration rate and renal blood flow generally remained unchanged with cilazapril, despite a clinically significant blood pressure reduction.

As with other ACE inhibitors, the blood pressure-lowering effect of cilazapril in black patients may be less pronounced than in non-blacks. However, racial differences in response are no longer evident when cilazapril is administered in combination with hydrochlorothiazide.

Congestive heart failure

In patients with congestive heart failure, the renin-angiotensin-aldosterone and sympathetic nervous systems are generally activated, leading to enhanced systemic vasoconstriction and promotion of sodium and water retention. By suppressing the renin-angiotensin-aldosterone system, cilazapril improves loading conditions in the failing heart by reducing systemic vascular resistance (afterload) and pulmonary capillary wedge pressure (preload) in patients on diuretics and/or digitalis. Furthermore, the exercise tolerance of these patients increases

significantly, showing an improvement in quality of life. The hemodynamic and clinical effects occur promptly and persist.

Pharmacokinetics

Cilazapril is efficiently absorbed and rapidly converted to the active form, cilazaprilat. Ingestion of food immediately prior to cilazapril administration delays and reduces absorption to a minor extent which, however, is therapeutically irrelevant. The bioavailability of cilazaprilat from oral cilazapril approximates 60 %, based on urinary recovery data. Maximum plasma concentrations are reached within 2 hours after administration and are directly related to dosage.

Cilazaprilat is eliminated unchanged by the kidneys, with an effective half-life of 9 hours after once-daily dosing with cilazapril.

In patients with renal impairment, higher plasma concentrations of cilazaprilat are observed than in patients with normal renal function, since clearance is reduced when creatinine clearance is lower. There is no elimination in patients with complete renal failure, but hemodialysis reduces concentrations of both cilazapril and cilazaprilat to a limited extent.

In elderly patients whose renal function is normal for age, plasma concentrations of cilazaprilat may be up to 40 % higher and clearance 20 % lower than in younger patients.

Increased plasma concentrations and reduced plasma and renal clearance were noted in patients with liver cirrhosis, with a greater effect on cilazapril than on the active metabolite cilazaprilat.

In patients with congestive heart failure, clearance of cilazaprilat is correlated with creatinine clearance. Thus, dosage adjustments beyond those recommended for patients with impaired renal function (*see Special dosage instructions*) should not be necessary.

Indications

Cilazapril is indicated in the treatment of all grades of essential hypertension and renovascular hypertension. Cilazapril is also indicated in the treatment of congestive heart failure as an adjunctive therapy with digitalis and/or diuretics.

Dosage and Administration

Standard dosage

Cilazapril should be administered once daily. As food intake has no clinically significant influence on absorption, cilazapril can be administered before or after a meal. The dose should always be taken at about the same time of day.

Special dosage instructions

Essential hypertension

The recommended initial dosage is half a 2.5 mg tablet once a day. Blood pressure should be assessed and dosage adjusted individually in accordance with the blood pressure response. The usual dose range of cilazapril is 2.5-5 mg once daily. If blood pressure is not adequately controlled with 5 mg cilazapril once daily, a low dose of a non-potassium-sparing diuretic may be administered concomitantly to enhance the antihypertensive effect.

Renovascular hypertension

Treatment with cilazapril should be initiated with a dose of 0.5 mg or 0.25 mg once daily since these patients may experience more pronounced decreases in blood pressure in response to ACE inhibitors than patients with essential hypertension. The maintenance dose should be adjusted individually.

Hypertensive patients receiving diuretics

The diuretic should be discontinued 2-3 days before beginning therapy with cilazapril to reduce the likelihood of symptomatic hypotension. It may be resumed later if required. The recommended starting dose in these patients is 0.5 mg once daily.

Congestive heart failure

Cilazapril can be used as adjunctive therapy with digitalis and/or diuretics in patients with congestive heart failure. Therapy with cilazapril should be initiated at a recommended starting dose of 0.5 mg once daily under close medical supervision. The dose should be increased to the lowest maintenance dose, 1 mg daily, according to tolerability and clinical status. Further titration within the usual maintenance dose range of 1-2.5 mg daily should be carried out based on tolerability and the patient's response and clinical status. The usual maximum dose is 5 mg once daily.

Results from clinical trials showed that clearance of cilazaprilat was correlated with creatinine clearance in patients with congestive heart failure. The special dosage recommendation in the "*Patients with Impaired renal function*" section should thus be followed in congestive heart failure patients with impaired renal function.

Patients with impaired renal function

Reduced dosages may be required for patients with renal impairment, depending on their creatinine clearance (see also Precautions, Hemodialysis/anaphylaxis). The following dosage schedules are recommended:

Creatinine clearance	Initial dose of cilazapril	Maximal dose of cilazapril
>40 ml/min	1 mg once daily	5 mg once daily
10-40 ml/min	0.5 mg once daily	2.5 mg once daily
<10 ml/min	0.25-0.5 mg once or twice a week according to blood pressure response	

Liver cirrhosis

In the unlikely event that patients with liver cirrhosis should require treatment with cilazapril, it should be initiated with caution at a dose of 0.5 mg or less once daily, because significant hypotension may occur.

Elderly with hypertension

Treatment with cilazapril should be initiated with 0.5 mg once daily. Thereafter, the maintenance dose of 1 mg to 2.5 mg must be adapted to individual tolerability, response and clinical status.

Elderly with congestive heart failure

The recommended starting dose of cilazapril 0.5 mg must be strictly followed in elderly patients with congestive heart failure receiving high-dose diuretic.

Children

Safety and efficacy in children have not been established. Therefore, there is no recommendation for administration of cilazapril to children.

Contraindications

Cilazapril is contraindicated in patients who are hypersensitive to cilazapril, to any component of the product or other ACE inhibitors.

Like other ACE inhibitors, cilazapril is contraindicated in patients with a history of angioedema related to previous treatment with an ACE inhibitor.

Cilazapril, like other ACE inhibitors, is contraindicated in pregnancy and lactation.

Warnings and Precautions

Like other ACE inhibitors, cilazapril should be used with caution in patients with aortic stenosis or outflow obstruction.

The recommended starting dose of cilazapril 0.5 mg must be strictly followed in elderly patients with congestive heart failure receiving high-dose diuretic.

Neutropenia

Neutropenia and agranulocytosis have been reported rarely with ACE inhibitors. Periodic monitoring of white blood cells counts should be considered in patients with collagen vascular disease and renal disease such as systemic lupus erythematosus and scleroderma or in patients receiving immuno-suppressive therapy especially when they also have impaired renal function.

Symptomatic hypotension

Occasionally, symptomatic hypotension has been reported with ACE inhibitor therapy, particularly in patients with sodium or volume depletion in connection with conditions such as vomiting or diarrhea, pretreatment with diuretics, low-sodium diet or after dialysis.

Acute hypotension should be treated by having the patient rest in the supine position and may require infusion of normal saline or volume expanders. After volume repletion, cilazapril therapy may be continued. However, if symptoms persist, the dosage should be reduced or the medicine discontinued.

Patients with congestive heart failure may experience a pronounced blood pressure decrease in response to ACE inhibitors. However, no symptomatic hypotension was observed in clinical trials following the first dose of 0.5 mg cilazapril in patients with congestive heart failure.

Renal impairment

Reduced dosages may be required for patients with renal impairment, depending on their creatinine clearance (*see Special dosage instructions*). In patients whose renal function depends primarily on the activity of the renin-angiotensin-aldosterone system, such as patients with severe heart failure or with unilateral or bilateral renal artery stenosis, treatment with ACE inhibitors including cilazapril may produce increases in blood urea nitrogen and/or serum creatinine. Although these alterations are usually reversible upon discontinuation of cilazapril and/or diuretic therapy, cases of severe renal dysfunction and, rarely, acute renal failure have been reported.

In this patient population, renal function should be monitored during the first weeks of therapy.

Hepatic failure

Rarely, ACE inhibitors have been associated with a syndrome that starts with cholestatic jaundice and progresses to fulminant hepatic necrosis, and (sometimes) death. The mechanism of this syndrome is not understood. Patients receiving ACE inhibitors who develop jaundice or marked elevations of hepatic enzymes should discontinue the ACE inhibitor and receive appropriate medical follow-up.

Serum potassium

Concomitant administration of potassium-sparing diuretics or potassium supplements may lead to increases in serum potassium, particularly in patients with renal impairment. Therefore, if concomitant use of such agents is indicated, their dosage should be reduced when cilazapril is initiated, and serum potassium and renal function should be monitored carefully (*see Properties and Effects, Interactions*).

Surgery/anaesthesia

The use of ACE inhibitors in combination with anaesthetic drugs in surgery that also have blood pressure-lowering effects can produce arterial hypotension. If this occurs, volume expansion by means of intravenous infusion or, if resistant to these measures, angiotensin II infusion is indicated.

Hypersensitivity/angioneurotic oedema

Angioneurotic oedema has been reported in patients being treated with ACE inhibitors.

Hemodialysis/anaphylaxis

Although the mechanism involved has not been definitely established, there is clinical evidence that hemodialysis or hemofiltration with polyacrylonitrile methallyl sulfate high-flux membranes (e.g. AN69) or LDL apheresis, if performed in patients being treated with ACE inhibitors, including cilazapril, can lead to the provocation of anaphylaxis/anaphylactoid reactions including life-threatening shock. The above-mentioned procedures must therefore be avoided in such patients.

Anaphylactic reactions can also occur in patients undergoing desensitization therapy with wasp or bee venom while receiving an ACE inhibitor. Cilazapril must therefore be interrupted before the start of desensitization therapy. Additionally, cilazapril must not be replaced by a beta blocker in this situation.

Patients with rare hereditary problems of galactose intolerance, the Lapp lactase deficiency or glucose-galactose malabsorption should not take this medicine.

Diabetes

Administration of ACE inhibitors in patients with diabetes may potentiate the blood glucose-lowering effect of oral hypoglycemic agents or insulin.

Ability to drive and use machines

Cilazapril is unlikely to affect a person's ability to drive a motor vehicle or operate machinery. However dizziness may occasionally occur and this should be taken into account.

Pregnancy and nursing mothers

Category D

Fetotoxicity has been observed for ACE inhibitors in animals. Although there is no experience with cilazapril, use of ACE inhibitors in human pregnancy has been associated with oligohydramnios, intrauterine growth restriction, neonatal hypotension, anuria and renal tubular dysplasia.

Foetal exposure to ACE inhibitors during the first trimester of pregnancy has been associated with an increased risk of malformations of the cardiovascular system (atrial and/or ventricular septal defect, pulmonic stenosis, patent ductus arteriosus) and central nervous system (microcephaly, spinal bifida) and an increased risk of kidney malformations.

Pregnant women should be informed of the potential hazards to the foetus (see *Contraindications*) and should not take cilazapril during pregnancy.

It is not known whether cilazapril passes into human breast milk, but since animal data show the presence of cilazaprilat in rat milk, cilazapril should not be administered to nursing mothers.

Adverse Effects

Headache and dizziness are the most frequently reported events in patients taking cilazapril for hypotension. In congestive heart failure clinical trials dizziness and coughing were the most frequently reported adverse events.

Cilazapril is usually well tolerated. The most common adverse effects include fatigue, hypotension, dyspepsia, nausea and other gastrointestinal disturbances, headache, rash and coughing. In most cases these effects were transient, mild or moderate in degree, and did not require discontinuation of therapy.

Blood and lymphatic system disorders

Blood disorders have been reported with ACE inhibitors and include neutropenia and agranulocytosis (especially in patients with renal failure or collagen vascular disorders e.g. systemic lupus erythematosus and scleroderma), thrombocytopenia and anemia.

Cardiac disorders

Pronounced hypotension may occur at the start of therapy with ACE inhibitors especially in patients with heart failure or in sodium or volume depleted patients. Myocardial infarction and stroke have been reported and may relate to severe falls in blood pressure in patients with ischaemic heart disease or cerebrovascular disease. Other cardiovascular effects that have occurred are tachycardia, palpitations and chest pain.

Gastrointestinal disorders

Isolated cases (some fatal) of pancreatitis have been reported.

Hepatobiliary disorders

Single cases of liver function disorders, such as increased liver function tests (transaminases, bilirubin, alkaline phosphatase, gamma GT) and cholestatic hepatitis with or without necrosis, have been reported.

Immune system disorders

As with other ACE inhibitors, angioneurotic edema has been reported, although rarely, in patients receiving cilazapril. Angioedema involving the tongue, glottis or larynx may be fatal. Since this syndrome can be associated with laryngeal oedema, cilazapril should be discontinued and appropriate therapy instituted without delay when involvement of the face, lips, tongue, glottis and/or larynx occurs. Emergency therapy should be given including, but not necessarily limited to, immediate intramuscular adrenalin (epinephrine) solution 1:1000 (0.3 ml to 0.5 ml) or slow intravenous adrenalin 1 mg/ml (observing dilution instructions) with control of ECG and blood pressure. The patient should be hospitalised and observed for at least 12 to 24 hours and should not be discharged until complete resolution of symptoms has occurred.

Skin and subcutaneous tissue disorders

Skin rashes including erythema multiforme and toxic epidermal necrolysis may occur. Photosensitivity, alopecia and other hypersensitivity reactions have also been reported.

Renal and urinary disorders

Isolated cases of acute renal failure have been reported in patients with severe heart failure, renal artery stenosis or renal disorders.

Interactions

Lithium should generally not be given with ACE inhibitors. ACE inhibitors reduce the renal clearance of lithium and increase and risk of lithium toxicity,

An additive effect may be observed when cilazapril is administered in combination with other blood pressure-lowering agents.

Potassium-sparing diuretics or potassium supplements administered together with cilazapril can lead to increases in serum potassium, particularly in patients with renal impairment (see *Warnings and Precautions*).

As with other ACE inhibitors, use of cilazapril concomitantly with a non-steroidal anti-inflammatory (NSAID) may diminish the antihypertensive effect of cilazapril. This does not appear to occur in patients treated with cilazapril prior to the administration of NSAIDs.

There was no increase in digoxin plasma concentrations when cilazapril was administered concomitantly with digoxin. Furthermore, no clinically significant interactions were observed when cilazapril was administered concomitantly with nitrates, coumarin anticoagulants and H₂-receptor blockers. No significant pharmacokinetic interactions between cilazapril and frusemide or thiazides were noted.

Laboratory test findings

Clinically relevant changes in laboratory test values possibly or probably related to cilazapril treatment have been observed only rarely.

Minor, mostly reversible increases in serum creatinine/urea have been observed in patients treated with cilazapril. Such changes are likely to occur in patients with renal artery stenosis or renal impairment (see *Warnings and Precautions*), but they have also occasionally been observed in patients with normal renal function, particularly in those receiving concomitant diuretics. Isolated cases of acute renal failure have been reported in patients with severe heart failure, renal artery stenosis or renal disorders (see *Warnings and Precautions*).

In some patients decreases in hemoglobin, hematocrit and/or white blood cell count have been reported.

Overdosage

While single doses of up to 160 mg cilazapril have been administered to normal healthy volunteers without untoward effects on blood pressure, only very few data on overdose are available in patients. The most likely events to occur are hypotension (which may be severe), hyperkalaemia, hyponatraemia and renal impairment with metabolic acidosis. Treatment should be mainly supportive and symptomatic. If indicated, cilazaprilat, the active form of cilazapril, can be partially removed from the body by haemodialysis. Therapy with angiotensinamide may be considered if conventional therapy is ineffective.

Pharmaceutical Precautions

Store below 25 °C. Keep out of reach of children.

Medicine Classification

Prescription Medicine.

Package Quantities

CILAZAPRIL-AFT 1 mg and 2.5 mg tablets: quantities of 100 tablets packed in HDPE bottles.
CILAZAPRIL-AFT 5 mg tablets: quantities of 100 and 500 tablets packed in HDPE bottles.

Further Information

Other ingredients in the tablets include lactose, microcrystalline cellulose, silicon dioxide, crospovidone and magnesium stearate.

Name and Address

AFT Pharmaceuticals Ltd
P O Box 33-203
Takapuna
AUCKLAND
Telephone: (09) 488-0232
Facsimile: (09) 488-0234

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