

Alphapress

Hydralazine hydrochloride



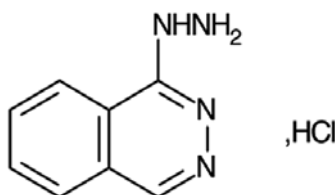
PRODUCT INFORMATION

NAME OF THE MEDICINE

Active ingredient: Hydralazine hydrochloride

Chemical name: 1-hydrazinophthalazine hydrochloride

Structural formula:



Molecular formula: C₈H₈N₄,HCl

Molecular weight: 196.6

CAS Registry No.: 304-20-1

DESCRIPTION

A white or almost white, crystalline powder, soluble in water, slightly soluble in alcohol, very slightly soluble in methylene chloride. It melts at about 275°C, with decomposition.

Each Alphapress 25 and Alphapress 50 tablet contains 25 mg and 50 mg of hydralazine hydrochloride, respectively. The tablets also contain the following inactive ingredients: magnesium stearate, sodium starch glycolate, talc – purified, disodium edetate, silica - colloidal anhydrous, starch - pregelatinised maize, cellulose – microcrystalline, Opadry Pink OY-LS-34902 [Alphapress 50 only].

PHARMACOLOGY

Hydralazine exerts its peripheral vasodilating effect through a direct relaxation of smooth muscle tissue in vascular resistance vessels, predominantly in the arterioles. The cellular mechanism of action responsible for this effect is not fully understood.

In hypertension, this effect results in decreased arterial blood pressure (diastolic more than systolic). A reflex action by the sympathetic nervous system compensates for this fall in blood pressure by increasing heart rate, stroke volume, and cardiac output. Up to 75% of the therapeutic effect of hydralazine can be lost by this reflex action. To counteract the reflex action, hydralazine is often given in conjunction with a β -blocker.

The preferential dilatation of arterioles, as compared with veins, minimises postural hypotension and promotes the increase in cardiac output. The peripheral vasodilatation is widespread but not uniform.

Splanchnic, coronary, cerebral, and renal blood flow increases unless the fall in blood pressure is very marked. Vascular resistance in the cutaneous and muscle beds is not consistently affected.

The use of hydralazine can result in sodium and fluid retention, producing oedema and reduced urinary volume. These unwanted effects are best prevented by concomitant administration of a diuretic.

Pharmacokinetics

Hydralazine is rapidly and completely absorbed after oral administration. In the plasma, only small amounts of the free drug can be traced, the bulk circulating in conjugated form, i.e. mainly as pyruvic acid hydrazone. Only the so called 'apparent' hydralazine, i.e. the sum of the free and conjugated hydralazine, can be measured reliably. Peak plasma concentrations are reached within 1 hour in most cases.

Orally administered hydralazine undergoes a dose dependent first-pass effect (systemic availability: 26 to 55%), this first-pass effect being dependent on the individual's acetylator status. In response to the same dose, slow acetylators show higher 'apparent' plasma hydralazine levels than rapid acetylators.

Hydralazine becomes bound to plasma proteins (chiefly albumin) to the extent of 88 to 90%. It is rapidly distributed in the body and displays a specific affinity for muscle tissue in the arterial walls. It crosses the placental barrier and also passes into human milk.

The pattern of the metabolites depends on the subject's acetylator and presumably hydroxylator status. Urinary excretion of NAc-HPZ (N-acetyl-hydrazine-phthalazinone), the main metabolite from the acetylation pathway, may be used to determine acetylator phenotype.

The plasma half-life generally ranges from 2 to 3 hours, but in rapid acetylators it is shorter, averaging 45 minutes. Hydralazine persists for longer periods at its site of action, arteriolar smooth muscle, which enables twice daily dosing. In patients with impaired renal function, the plasma half-life is prolonged to up to 16 hours at creatinine clearance of less than 20 mL/minute. Renal elimination may be impaired in patients of advanced age.

Hydralazine and its metabolites are rapidly excreted by the kidney. Within 24 hours after an oral dose, approximately 80% of it can be recovered in the urine. The bulk of the hydralazine excreted is in the form of acetylated and hydroxylated metabolites, some of which are conjugated with glucuronic acid; 2 to 14% is excreted as 'apparent' hydralazine.

INDICATIONS

Hypertension (drug resistant, moderate to severe): as *supplementary medication* for use together with other antihypertensives such as beta-blockers and diuretics; the complementary mechanisms of action of such combined therapy enable the drugs to exert their antihypertensive effects at low doses; in addition, unwanted accompanying effects of the individual substances are either partially offset or even cancelled out.

CONTRAINDICATIONS

- Known hypersensitivity to hydralazine or dihydralazine.
- Idiopathic systemic lupus erythematosus (SLE) and related diseases.
- Severe tachycardia and heart failure with a high cardiac output (e.g. in thyrotoxicosis).
- Myocardial insufficiency due to mechanical obstruction (e.g. in the presence of aortic or mitral stenosis or constrictive pericarditis).
- Isolated right ventricular heart failure due to pulmonary hypertension (cor pulmonale).
- Dissecting aortic aneurysm.

PRECAUTIONS

Cardiac Dysfunction. The overall hyperdynamic state of the circulation induced by hydralazine may accentuate certain clinical conditions. Myocardial stimulation may provoke or aggravate angina pectoris or provoke myocardial infarction. Hydralazine can cause anginal attacks and ECG changes indicative of myocardial ischaemia. Therefore, it must be used with caution in patients with suspected coronary artery disease. Patients with suspected or confirmed coronary artery disease should therefore be given Alphapress only under cover of a beta-blocker or in combination with other suitable sympatholytic agents. It is important that the beta-blocker medication should be commenced a few days before the start of treatment with Alphapress.

Patients who have survived a myocardial infarction should not receive Alphapress until a post-infarction stabilisation phase has been achieved. Hydralazine should not be used in heart failure.

SLE-like Syndrome with Long-Term Use of Oral Hydralazine. Prolonged treatment with hydralazine (i.e. usually treatment for more than 6 months) may provoke a systemic lupus erythematosus (SLE)-like syndrome, especially where dosages exceeding 100 mg daily are prescribed. In its mild form this syndrome is reminiscent of rheumatoid arthritis (arthralgia, sometimes associated with fever and skin rash) and proves reversible after withdrawal of the drug. In its more severe form it resembles acute SLE, and long-term treatment with corticosteroids may be required to reverse it completely. Since such reactions tend to occur more frequently the higher the dosage and the longer the duration of the medication, and since they are also more common in slow acetylators, it is recommended that for maintenance therapy the lowest dosage that still proves effective should be used. If 100 mg daily fails to elicit an adequate clinical effect, the patient's acetylator status should be evaluated.

Slow acetylators and women run a greater risk of developing an SLE-like syndrome. In such patients every effort should therefore be made not to exceed a dosage of 100 mg daily; a careful watch should also be kept for clinical signs and symptoms suggestive of an SLE-like syndrome.

Rapid acetylators, by contrast, often respond inadequately even to dosages of 100 mg daily. In these patients, the dosage can be raised with only a slightly increased risk of an SLE-like syndrome.

During long-term treatment with Alphapress it is advisable to determine the antinuclear factors (ANF) and to carry out urine analyses at intervals of approximately 6 months. Microhaematuria and/or proteinuria, in particular together with positive titres of ANF, may be initial signs of immune complex glomerulonephritis associated with the SLE-like syndrome. If overt clinical signs and symptoms develop, the drug should be withdrawn at once.

Renal or Hepatic Impairment. In patients with renal impairment (creatinine clearance less than 30 mL/minute or serum creatinine concentration greater than 2.5 mg/100 mL or 221 micromol/L) and in patients with hepatic dysfunction, the dose or the dosing interval must be adapted according to the clinical response, in order to avoid accumulation of the 'apparent' active substance.

Cerebrovascular Disease. Like all potent antihypertensives, Alphapress should be used with caution in patients suffering from cerebrovascular disease, since it can cause ischaemia.

Use During Surgery. When undergoing surgery, patients treated with Alphapress may show a fall in blood pressure, in which case one should not use adrenaline to correct the hypotension, since it enhances the cardiac accelerating effects of hydralazine.

Ability To Drive or Use Machines. Alphapress, especially at the start of treatment, may impair the patient's reactions, e.g. when driving or operating machines.

Carcinogenesis, Mutagenesis, Impairment of Fertility

Hydralazine induces gene mutations, chromosomal aberrations and DNA damage in mammalian cells *in vitro*, as well as gene mutations in bacteria, yeast and *Drosophila*. The potential for similar effects *in vivo* has not been adequately reported. Carcinogenicity studies in Swiss mice showed an increased incidence of pulmonary adenomas and adenocarcinomas when hydralazine was administered in the drinking water at concentrations of 312 to 1,250 ppm (approximately 50 to 200 mg/kg/day); a 'no effect' dose has not been established. A carcinogenicity study in rats dosed by gavage at 15, 30 and 60 mg/kg/day showed increases in the incidence of hepatic neoplasms in both sexes and Leydig cell tumours in males.

In the absence of adequate information on the genotoxic activity of hydralazine in *in vivo* studies, the possibility that the carcinogenic effects of hydralazine may be related to its genotoxic activity cannot be ruled out. The extent to which these findings indicate a risk to humans is uncertain. While long-term clinical observation has not suggested that human cancer is associated with hydralazine use, epidemiological studies have so far been insufficient to arrive at any conclusions.

Use in Pregnancy (Category C)

Animal experiments have shown hydralazine, causing cleft palate and malformations of facial and cranial bones, is teratogenic in mice at oral doses equal to or greater than 20 mg/kg/day; a 'no effect' dose has not been clearly established. Hydralazine was teratogenic in rabbits where oral doses equal to and greater than 75 mg/kg/day caused phalangeal defects. Hydralazine was not teratogenic in rats at oral doses up to 180 mg/kg/day. Embryoletality was observed in mice at doses equal to or greater than 20 mg/kg/day. Hydralazine was, however, not embryoletal in rats and rabbits at oral doses up to 180 and 60 mg/kg/day, respectively. Delayed ossification was observed in mice and rats at maternotoxic doses greater than 20 and 60 mg/kg/day, respectively, and reduced foetal weight was seen in mice at doses greater than 20 mg/kg/day.

Hydralazine crosses the placenta and following intravenous administration has been associated with foetal distress and foetal cardiac arrhythmia in the last trimester of pregnancy. In view of the possible teratogenic potential in humans, use of Alphapress in pregnancy before the third trimester should be avoided. The drug should only be given in the third trimester after weighing the needs of the mother against the risk to the foetus.

Use in Lactation

Hydralazine passes into human breast milk. Alternatives to hydralazine should be considered in breastfeeding women unless the benefits are considered to outweigh the risks.

Interactions with Other Medicines

Concomitant treatment with other vasodilators, calcium antagonists, ACE inhibitors, diuretics, antihypertensives, tricyclic antidepressants, and major tranquillizers, as well as the consumption of alcohol, may potentiate the blood pressure lowering effect of Alphapress. In particular, administration of Alphapress shortly before or after diazoxide may give rise to marked hypotension. Monoamine oxidase inhibitors (MAOIs) should be used with caution in patients receiving Alphapress.

Concurrent administration of Alphapress with beta-blockers, such as propranolol, metoprolol and other beta-blockers subject to a strong first-pass effect, may increase their bioavailability. Downward dosage adjustment of these drugs may be required when they are given concomitantly with Alphapress.

Adrenaline enhances the cardiac accelerating effects of hydralazine (see **Precautions, Use During Surgery**).

ADVERSE EFFECTS

The unwanted effects listed below are derived from the use of both oral and parenteral hydralazine.

Some of the unwanted effects listed below such as tachycardia, palpitation, anginal symptoms, flushing, headache, dizziness, nasal congestion and gastrointestinal disturbances are commonly seen at the start of treatment, especially if the dosage is raised rapidly. However, such reactions generally subside in the further course of treatment.

Frequency Estimates:

Very Common $\geq 10\%$, Common ≥ 1 to $<10\%$, Uncommon $\geq 0.1\%$ to $<1\%$, Rare $\geq 0.01\%$ to $<0.1\%$, Very Rare $<0.01\%$.

Cardiovascular System

<i>Very Common.</i>	Tachycardia, palpitation.
<i>Common.</i>	Flushing, hypotension, anginal symptoms.
<i>Uncommon.</i>	Oedema, heart failure.
<i>Very Rare.</i>	Paradoxical pressor responses.

Central and Peripheral Nervous System

<i>Very Common.</i>	Headache.
<i>Uncommon.</i>	Dizziness.
<i>Very Rare.</i>	Peripheral neuritis, polyneuritis, paraesthesiae (these unwanted effects may be reversed by administration of pyridoxine), tremor.

Musculoskeletal System

<i>Common.</i>	Arthralgia, joint swelling, myalgia.
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Skin and Appendages

<i>Uncommon.</i>	Rash.
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Genitourinary

<i>Uncommon.</i>	Proteinuria, increased plasma creatinine, haematuria sometimes in association with glomerulonephritis.
<i>Very Rare.</i>	Acute renal failure, urinary retention.

Gastrointestinal Tract

<i>Common.</i>	Gastrointestinal disturbances, diarrhoea, nausea, vomiting.
<i>Uncommon.</i>	Jaundice, liver enlargement, abnormal hepatic function sometimes in association with hepatitis.
<i>Very Rare.</i>	Paralytic ileus.

Haematological

<i>Uncommon.</i>	Anaemia, leucopenia, neutropenia, thrombocytopenia with or without purpura.
<i>Very Rare.</i>	Haemolytic anaemia, leucocytosis, lymphadenopathy, pancytopenia, splenomegaly; agranulocytosis.

Psychological

Uncommon. Agitation, anorexia, anxiety.
Very Rare. Depression, hallucinations.

Sense Organs

Uncommon. Increased lacrimation, conjunctivitis, nasal congestion.

Hypersensitivity Reactions

Uncommon. SLE-like syndrome (see **Precautions**), hypersensitivity reactions such as pruritus, urticaria, vasculitis, eosinophilia, hepatitis.

Respiratory Tract

Uncommon. Dyspnoea, pleural pain.

Miscellaneous

Uncommon. Fever, weight decrease, malaise.
Very Rare. Exophthalmos, retroperitoneal fibrosis.

DOSAGE AND ADMINISTRATION

The dosage must always be adjusted to the individual requirements of the patient and the following recommendations adhered to.

Adults. Treatment should begin with low doses of Alphapress, which, depending on the patient's response, should be increased stepwise in order to achieve an optimal therapeutic effect and to avoid unwanted effects as far as possible.

Give Alphapress in a twice daily regimen; the usual starting dosage of 25 mg twice daily is generally sufficient. This dosage can be increased as required within the effective maintenance dosage range of 50 to 200 mg daily. However, the dose should not be increased above 100 mg daily without determining the acetylator phenotype (see **Precautions**).

Children. Safety and efficacy of hydralazine have not been established in children.

OVERDOSAGE

Symptoms. The chief manifestations are cardiovascular disorders such as pronounced tachycardia and hypotension, which are accompanied by nausea, dizziness, and sweating, which can result in circulatory collapse; also possible are myocardial ischaemia with angina pectoris and cardiac arrhythmias. Further signs and symptoms may include impairment of consciousness, headache, and vomiting, as well as possibly tremor, convulsions, oliguria, and hypothermia.

Treatment. Activated charcoal may be administered. Treatment is supportive and symptomatic care. Severe hypotension may respond to placing the patient in the supine position with the feet raised. The effects of gross overdosage may be treated by the infusion of plasma expanders.

PRESENTATION AND STORAGE CONDITIONS

Alphapress 25, 25 mg tablet: flat, cream, scored; bottles of 100s.

Alphapress 50, 50 mg tablet: pink, convex, film coated, marked HE over 50 on one side, G on the reverse; bottles of 100s.

Store below 30°C.

POISON SCHEDULE OF THE MEDICINE

S4 – Prescription Only Medicine

NAME AND ADDRESS OF THE SPONSOR

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DATE OF APPROVAL

Approved by the Therapeutic Goods Administration on 23 August 2005.