Nifedipine Capsules

DESCRIPTION

Nifedipine is an endothelin drug belonging to a class of pharmacological agents, the calcium channel blockers. Nifedipine is a 3,5-pyridinedicarboxylic acid, 1,4-dihydro-2,6-dimethyl-4-(2-nitrophenyl)-, dimethyl ester, C_{21}H_{27}N_{2}O_{7}, with the empirical formula.

Nifedipine is a yellow crystalline substance, and is stable and insoluble in water or ethanol. It has a molecular weight of 346.4. Nifedipine capsules are formulated as soft gelatin capsules and are available in 10 mg, 20 mg, and 30 mg strengths.

CLINICAL PHARMACOLOGY

Mechanism of Action

Nifedipine is a calcium channel blocker that exhibits selective, competitive antagonism at vascular smooth muscle as well as cardiac muscle calcium channels. Nifedipine inhibits calcium ion influx across the cell membrane of cardiac muscle and vascular smooth muscle. This property increases myocardial oxygen delivery and affects arteriolar smooth muscle. This results in decreased systemic vascular resistance and a decrease in arterial pressure. Nifedipine selectively inhibits voltage-gated calcium channels. Nifedipine is 3,5-pyridinedicarboxylic acid, 1,4-dihydro-2,6-dimethyl-4-(2-nitrophenyl)-, dimethyl ester, C_{21}H_{27}N_{2}O_{7}, with the empirical formula.

Nifedipine exerts its effects by blocking the influx of extracellular calcium ions into specific ion channels. Nifedipine selectively inhibits calcium channel activity in smooth muscle, thereby increasing myocardial oxygen delivery in patients with coronary artery spasm, whether spontaneous or ergonovine-induced. Nifedipine also inhibits calcium ion influx into the platelet membrane of platelets activated by collagen or ADP.

Alpha vascular effect is not shown on any dose level of nifedipine in patients with essential hypertension. In the heart, calcium is required for the release of preformed catecholamine and for the myocardial contractile process. Nifedipine selectively inhibits calcium channel activity in smooth muscle, thereby increasing myocardial oxygen delivery in patients with coronary artery spasm, whether spontaneous or ergonovine-induced. Nifedipine also inhibits calcium ion influx into the platelet membrane of platelets activated by collagen or ADP.

Excessive Hypotension

Although, in this clinical experience, excessive hypotension is not frequent, this adverse effect has occurred with nifedipine. In clinical studies, nifedipine has not been associated with significant arterial hypotension. However, a small number of patients have experienced a decrease in blood pressure. In general, the blood pressure response is proportional to dose from 10 to 30 mg; half-life does not change significantly with dose. The increased plasma concentrations are most likely due to inhibition of CYP 3A4 related first-pass metabolism. The increased plasma concentrations are most likely due to inhibition of CYP 3A4 related first-pass metabolism.

Nifedipine is rapidly and fully absorbed after oral administration. The drug is detectable in serum within 1 hour after oral administration, and peak plasma levels occur approximately 2 hours later. Bioavailability is comparable from doses in 10 to 60 mg, and the total blood plasma levels increase with dose over significant areas.

Nifedipine is widely distributed in plasma, and 85% of a single dose is excreted in the urine in 48 hours. The predominant route for excretion is via the kidneys. The half-life of nifedipine in plasma is approximately 2 hours. The volume of distribution of nifedipine is 25 to 30 L/kg in normal subjects. The volume of distribution is 25 to 30 L/kg in normal subjects. The drug is not metabolized to any significant extent in plasma. The drug is not metabolized to any significant extent in plasma.

Pharmacokinetics and Metabolism

In healthy subjects, the elimination half-life of the BID sustained release nifedipine formulation (that was not 500 mg capsules) was approximately 6.7 hours in elderly subjects (3.8 hours) following oral administration. A decreased clearance was observed with increasing age, and co-administration with other drugs. A decreased clearance was observed with increasing age, and co-administration with other drugs.

Co-administration of nifedipine with grapefruit juice resulted in a significantly increased plasma concentration and effect. The increase in plasma concentration is most likely due to inhibition of CYP 3A4 mediated transport process.

Hypothermics

Several well-controlled, randomized trials studied the use of immediate-release nifedipine in patients with chronic stable angina, usually receiving a beta blocker, had developed heart failure after beginning nifedipine therapy. In those patients who have had angiography, the presence of significant fixed obstructive lesions is satisfied. Nifedipine may also be used where the clinical presentation suggests a possible vasospasm component. Several well-controlled, randomized trials studied the use of immediate-release nifedipine in patients with chronic stable angina, usually receiving a beta blocker, had developed heart failure after beginning nifedipine therapy. In those patients who have had angiography, the presence of significant fixed obstructive lesions is satisfied. Nifedipine may also be used where the clinical presentation suggests a possible vasospasm component.

Increased Angina and/or Myocardial Infarction

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Beta Blocker Withdrawal

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