

## SUMMARY OF PRODUCT CHARACTERISTICS

### 1 NAME OF THE MEDICINAL PRODUCT

Nicardipine Hydrochloride 20 mg Capsules.

### 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each capsule contains 20 mg of nicardipine hydrochloride

For the full list of excipients, see 6.1.

### 3 PHARMACEUTICAL FORM

Capsule.

Hard gelatin capsule filled with a light yellow granule.

Size 3, white opaque body, pink opaque cap.

### 4 CLINICAL PARTICULARS

#### 4.1 Therapeutic indications

The prophylaxis of patients with chronic stable angina, and the treatment of mild to moderate hypertension.

#### 4.2 Posology and method of administration

##### Posology

##### *Angina:*

Starting dose: 20 mg every 8 hours titrating upwards as required.

Usual effective dose: 30 mg every 8 hours (range of total daily dose 60 mg - 120 mg per day).

Allow at least 3 days before increasing the dose of nicardipine to ensure steady-state plasma levels have been achieved.

##### *Hypertension:*

Starting dose: 20 mg every 8 hours titrating upwards as required.

Usual effective dose: 30 mg every 8 hours (range of total daily dose 60 mg - 120 mg per day).

Nicardipine may be used in combination with beta-blockers, diuretics and nitrates. When used concomitantly with beta-blockers additive anti-anginal efficacy has been demonstrated (see section 4.5).

#### *Use in elderly*

Starting dose is 20 mg three times a day. Titrate upwards with care as nicardipine may lower systolic pressure more than diastolic pressure in elderly patients.

#### *Paediatric population*

The safety and efficacy in low birth-weight infants, newborns, nursing infants, infants, and children has not been established. Nicardipine is not recommended in patients under the age of 18 years.

#### Method of administration

Nicardipine Capsules are for oral administration.

The capsules should be swallowed whole with a little water.

### **4.3 Contraindications**

- i) Hypersensitivity to nicardipine hydrochloride or other dihydropyridines because of the theoretical risk of cross-reactivity or to any of the excipients listed in section 6.1.
- ii) Pregnancy and lactation.
- iii) Severe aortic stenosis (because part of the effect of nicardipine is secondary to reduced afterload). Reduction of diastolic pressure in these patients may worsen rather than improve myocardial infarction.
- iv) Cardiogenic shock, clinically significant aortic stenosis, unstable angina, and during or within one month of a myocardial infarction.
- v) Nicardipine should not be used for acute attacks of angina.
- vi) Nicardipine should not be used for secondary prevention of myocardial infarction.
- vii) Acute porphyria

### **4.4 Special warnings and precautions for use**

When nicardipine is used as monotherapy, caution is advised to avoid an excessive decrease in blood pressure. If used in combination with diuretics or beta-blockers, careful titration of nicardipine is advised.

Caution should be exercised when using nicardipine in combination with a beta-blocker in patients with decreased cardiac function.

If switching from beta-blockers to nicardipine, gradually reduce the beta-blocker dose (preferably over 8-10 days) since nicardipine gives no protection against the dangers of abrupt beta-blocker withdrawal.

Stop nicardipine in patients experiencing ischaemic pain within 30 minutes of starting therapy or after increasing the dose.

*Ischemic heart disease:*

Short-acting dihydropyridines are associated with an increased risk of ischemic cardiovascular events.

*Use in patients with congestive heart failure or poor cardiac reserve*

Haemodynamic studies in patients with heart failure have shown that nicardipine reduces afterload and improves overall haemodynamics. In one study, intravenous nicardipine reduced myocardial contractility in patients with severe heart failure despite increases in cardiac index and ejection fraction noted in the same patients.

Since nicardipine has not been extensively studied in patients with severe left ventricular dysfunction and cardiac failure the occurrence of worsening of cardiac failure must be considered.

*Hypoxia*

Cases of hypoxia have been reported after intravenous administration of nicardipine, particularly in patients with pre-existing pulmonary disorders or other conditions that may compromise respiratory function. Careful monitoring of oxygenation is recommended in these patients.

*Use in patients with impaired hepatic or renal function*

Since nicardipine is subject to first-pass metabolism, use with caution in patients with impaired liver function or reduced hepatic blood flow. Patients with severe liver disease showed elevated blood levels and the half-life of nicardipine was prolonged. Nicardipine blood levels may also be elevated in some renally-impaired patients. Therefore, the lowest starting dose and extending the dosing interval should be individually considered in these patients.

*Use in patients following a stroke (infarction or haemorrhage)*

Avoid inducing systemic hypotension when administering nicardipine to these patients.

*Laboratory tests*

Transient elevations of alkaline phosphatase, serum bilirubin, SGPT, SGOT and glucose have been observed. BUN and creatinine may also become elevated. While out-of-range values were seen in T<sub>3</sub>, T<sub>4</sub> and TSH, the lack of consistent alterations suggests that any changes were not drug-related.

Treatment with short-acting nicardipine may induce an exaggerated fall in blood pressure and reflex tachycardia which can cause cardiovascular complications such as myocardial and cerebrovascular ischaemia.

There has been some concern about increased mortality and morbidity in the treatment of ischaemic heart disease using higher than recommended doses of some other short-acting dihydropyridines.

## 4.5 Interaction with other medicinal products and other forms of interaction

### *Inhibitors and inducers of cytochrome P450 3A4*

Nicardipine is metabolised by cytochrome P450 3A4. Concomitant administration of nicardipine with inducers (e.g. carbamazepine and rifampicin) or inhibitors (e.g. cimetidine and grapefruit juice) of cytochrome P450 3A4 may alter the plasma levels of nicardipine.

Clinical monitoring during treatment with an enzyme inducing or inhibiting agent, and after its discontinuation, is required.

### *Cyclosporine, tacrolimus and sirolimus*

Concomitant administration of nicardipine and cyclosporine, tacrolimus or sirolimus results in elevated plasma cyclosporine, tacrolimus or sirolimus levels. Cyclosporine, tacrolimus or sirolimus levels should be monitored and dosage of immunosuppressant and/or nicardipine should be reduced, if required.

### *Digoxin*

Careful monitoring of serum digoxin levels is advised in patients also receiving nicardipine as levels may be increased.

### *Beta-blockers and other anti-hypertensive drugs*

Nicardipine may be used in combination with beta-blocking and other anti-hypertensive drugs but the possibility of an additive effect resulting in postural hypotension should be considered.

### *Propranolol, dipyridamole, warfarin, quinidine, naproxen*

Therapeutic concentrations of these drugs does not change the *in vitro* plasma protein binding of nicardipine.

### *Fentanyl anaesthesia*

Severe hypotension has been reported during fentanyl anaesthesia with concomitant use of a beta-blocker and calcium blockade. Even though such interactions have not been seen in clinical trials, such hypotensive episodes should be vigorously treated with conventional therapy such as intravenous fluids.

### *Cimetidine*

Cimetidine increases nicardipine plasma levels. Carefully monitor patients receiving both drugs.

## 4.6 Pregnancy and lactation

### Pregnancy

See contra-indications (section 4.3).

Acute pulmonary oedema has been observed when nicardipine has been used as tocolytic during pregnancy (see section 4.8), especially in cases of multiple pregnancy (twins or more), with the intravenous route and/or concomitant use of beta-2 agonists.

#### Breast-feeding

Because nicardipine was found in maternal milk, breast-feeding must be discontinued during nicardipine treatment (see section 5.3).

### **4.7 Effects on ability to drive and use machines**

Caution should be exercised because the hypotensive effects of this drug may cause dizziness.

### **4.8 Undesirable effects**

The majority of side effects are not serious and are expected consequences of the vasodilatory effects of nicardipine.

The most frequent side effects reported are headache, oedema peripheral, heat sensation and/or flushing, palpitations, nausea and dizziness.

Other side effects noted in clinical trials include the following:

#### ***Cardiac disorders***

##### Tachycardia

As with the use of other short-acting dihydropyridines in patients with ischaemic heart disease, exacerbation of angina pectoris may occur frequently at the start of treatment with nicardipine capsules. The occurrence of myocardial infarction has been reported although it is not possible to distinguish such an event from the natural course of ischaemic heart disease

#### ***Gastro-intestinal disorders***

Gastro-intestinal upset, gingival hyperplasia, vomiting

#### ***General disorders and administration site conditions***

Asthenia

#### ***Hepatobiliary disorders***

Hepatic function abnormal

#### ***Renal and urinary disorders***

Renal function abnormal, frequency of micturition

#### ***Nervous system disorders***

Drowsiness, insomnia, tinnitus, paraesthesia, functional disorders (depression, lassitude, nervousness)

***Respiratory, thoracic and mediastinal disorders***

Dyspnoea

Frequency: unknown

Pulmonary oedema\*

\*cases have been also reported when used as tocolytic during pregnancy (see section 4.6)

***Skin and subcutaneous tissue disorders***

Erythema, pruritis, rash

***Vascular disorders***

Hypotension, orthostatic hypotension

***Immune system disorders***

Anaphylactic reaction

Frequency: Unknown

***Investigations***

Hepatic enzyme increased

Frequency: Unknown

Rarely, depression impotence and thrombocytopenia have been reported.

The above mentioned listed adverse reactions have been observed during clinical studies and/or during marketed use.

**Reporting of suspected adverse reactions**

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via the Yellow Card Scheme at [www.mhra.gov.uk/yellowcard](http://www.mhra.gov.uk/yellowcard) or search for MHRA Yellow Card in the Google Play or Apple App Store.

**4.9 Overdose**

Symptoms may include marked hypotension, bradycardia, palpitations, flushing, drowsiness, confusion and slurred speech. In laboratory animals, overdosage also resulted in reversible hepatic function abnormalities, sporadic focal hepatic necrosis and progressive atrioventricular conduction block.

Standard measures (e.g. gastric lavage), including monitoring of cardiac and respiratory functions should be implemented. Position the patient to avoid cerebral anoxia. Frequent blood pressure determinations are essential. Vasopressors are clinically indicated for patients exhibiting profound hypotension. Intravenous calcium gluconate may help reverse the effects of calcium entry blockade.

## 5 PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Selective calcium channel blockers (dihydropyridine derivative) with mainly vascular effects

ATC code: C08CA04.

#### Mechanism of action

Nicardipine is a potent calcium antagonist. Pharmacological studies demonstrate its preferential high selectivity for the peripheral vasculature over the myocardium, which accounts for its minimal negative inotropic effects. Nicardipine produces smooth muscle relaxation and marked peripheral vasodilatation.

#### Pharmacodynamic effects

In humans nicardipine produces a significant decrease in systemic vascular resistance, the degree of vasodilatation being more predominant in hypertensive patients than in normotensive subjects.

#### Clinical efficacy and safety

Haemodynamic studies in patients with coronary artery disease and normal left ventricular function have shown significant increases in cardiac index and coronary blood flow, with little if any increase in left ventricular end-diastolic pressure.

#### Electrophysiologic effects

Electrophysiological studies in humans show that nicardipine does not depress sinus node function or atrial or ventricular conduction in patients with either normal or decreased electrical conduction systems. Refractory periods of the His-Purkinje system were actually shortened slightly by nicardipine and SA conduction time was improved.

### 5.2 Pharmacokinetic properties

#### Absorption

Nicardipine is rapidly and completely absorbed with plasma levels detectable 20 minutes following an oral dose. Maximum plasma levels are observed within 30 minutes to 2 hours (mean  $T_{max} = 1$  hour). When given with a high-fat meal peak plasma levels are reduced by 30%. Nicardipine is subject to saturable first-pass metabolism and the bioavailability is about 35% following a 30 mg oral dose at steady state.

Steady-state plasma levels are achieved after about 3 days of dosing at 20 mg and 30 mg tds and remain relatively constant over 28 days of dosing at 30 mg tds. Considerable intersubject variability in plasma levels is observed. Following dosing to steady state using doses of 30 mg and 40 mg (tds), the terminal plasma half-life of nicardipine averaged 8.6 hours.

#### Distribution

Nicardipine is highly protein bound (> 99%) in human plasma over a wide concentration range.

#### Biotransformation

Nicardipine is metabolised by cytochrome P450 3A4. Studies involving either a single dose, or administration 3 times daily for 3 days, have shown that less than 0.03% of unchanged nicardipine is recovered in the urine in humans after oral or intravenous administration. The most abundant metabolite in human urine is the glucuronide of the hydroxy form, which is formed by the oxidative cleaving of the N-methylbenzyl moiety and the oxidation of the pyridine. Nicardipine does not induce its own metabolism and does not induce hepatic microsomal enzymes.

#### Elimination

Following a radioactive oral solution dose, 60% of the radioactivity was recovered in the urine and 35% in faeces. Most of the dose (> 90%) was recovered within 48 hours of dosing.

#### **Renal impairment**

The pharmacokinetics of orally administered nicardipine SR capsule 45 mg were studied in subjects with severe renal dysfunction requiring haemodialysis (creatinine clearance < 10 ml/min), mild/moderate renal dysfunction (creatinine clearance 10 - 50 ml/min) and normal renal dysfunction (creatinine clearance >50 ml/min). At steady state,  $C_{max}$  and AUC were significantly higher and clearance significantly lower in subjects with mild/moderate renal dysfunction compared with in subjects with normal renal function. There were no significant differences in the principal pharmacokinetic parameters between severe renal dysfunction and normal renal dysfunction. These results are similar to those seen with other oral formulations (see section 4.4).

#### Linearity/non-linearity

The pharmacokinetics of nicardipine are non-linear due to saturable hepatic first pass metabolism.

### **5.3 Preclinical safety data**

Please refer to section 4.6 Fertility, pregnancy and lactation.

Nicardipine has been shown to pass into the milk of lactating animals. It has been reported in animal experiments that the drug is excreted into breast milk.

In animal experiments where this drug was administered at a high dose during the terminal stage of pregnancy, an increase in foetal deaths, delivery disturbances, decrease in the body weight of offspring, and suppression of post-natal body weight gain were reported. However, the toxicity to reproduction has not been reported.

Bacteriological tests have indicated that nicardipine does not demonstrate mutagenic potential. There is no information on the carcinogenic potential of nicardipine, and no evidence in the literature that there are any grounds for suspicion that would necessitate testing.

## **6 PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

Maize starch  
Sodium starch glycollate  
Maize starch, pregelatinised  
Capsule:  
Gelatin  
Titanium dioxide (E171)  
Erythrosine (E127)

### **6.2 Incompatibilities**

None known.

### **6.3 Shelf life**

3 years.

### **6.4 Special precautions for storage**

Do not store above 25°C. Store in the original container.

### **6.5 Nature and contents of container**

Blisters of 300 µm white opaque polypropylene welded on a 15 µm internally film-coated aluminium semi-rigid support, or 250 micron white opaque PVDC coated PVC welded on a 20 micron internally film-coated aluminium semi-rigid support.

Packed in cardboard cartons containing 28 or 56 capsules.

Not all pack sizes may be marketed.

**6.6 Special precautions for disposal and other handling**

No special requirements for disposal

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

**7 MARKETING AUTHORISATION HOLDER**

Tillomed Laboratories Ltd  
220 Butterfield  
Great Marlings  
Luton  
LU2 8DL  
United Kingdom

**8 MARKETING AUTHORISATION NUMBER(S)**

PL 11311/0101

**9 DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION**

Date of first authorisation: 03/112000

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**10 DATE OF REVISION OF THE TEXT**

12/05/2026