

# Summary of Product Characteristics

## 1 NAME OF THE MEDICINAL PRODUCT

Pyranistole 200 mg prolonged release capsules

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each prolonged-release capsule contains 200 mg dipyridamole.

For the full list of excipients, see section 6.1.

## 3 PHARMACEUTICAL FORM

Prolonged-release capsule, hard.

Each prolonged-release capsule contains yellow coloured pellets encapsulated in opaque, white hard gelatin capsule shells, dimension approximately 23 mm x 8 mm (size "0el"). Each capsule is imprinted with "RENATA" on the cap and "DPY 200" on the body with edible black ink.

## 4 CLINICAL PARTICULARS

### 4.1 Therapeutic indications

Secondary prevention of ischaemic stroke and transient ischaemic attacks either alone or in conjunction with aspirin.

An adjunct to oral anti-coagulation for prophylaxis of thromboembolism associated with prosthetic heart valves.

### 4.2 Posology and method of administration

#### Posology

#### *Adults, including the elderly:*

The recommended dose is one capsule twice daily, usually one in the morning and one in the evening preferably with meals.

#### *Paediatric population:*

Pyranistole capsules 200 mg is not recommended for children.

#### Method of administration

For oral administration. The capsules should be swallowed whole without chewing.

### 4.3 Contraindications

Hypersensitivity to the active substance or to any of the excipients listed in section 6.1.

### 4.4 Special warnings and precautions for use

Among other properties, dipyridamole acts as a potent vasodilator. It should therefore be used with caution in patients with severe coronary artery disease including unstable angina and/or recent myocardial infarction, left ventricular outflow obstruction or haemodynamic instability (e.g. decompensated heart failure).

Patients being treated with regular oral doses of Pyranistole capsules should not receive additional intravenous dipyridamole. Clinical experience suggests that patients being treated with oral dipyridamole who also require pharmacological stress testing with intravenous dipyridamole, should discontinue drugs containing oral dipyridamole for twenty-four hours prior to stress testing.

In patients with myasthenia gravis readjustment of therapy may be necessary after changes in dipyridamole dosage. (See Interactions).

Pyranistole capsules should be used with caution in patients with coagulation disorders.

A small number of cases have been reported in which unconjugated dipyridamole was shown to be incorporated into gallstones to a variable extent (up to 70% by dry weight of stone). These patients were all elderly, had evidence of ascending cholangitis and had been treated with oral dipyridamole for a number of years. There is no evidence that dipyridamole was the initiating factor in causing gallstones to form in these patients. It is possible that bacterial deglucuronidation of conjugated dipyridamole in the bile may be the mechanism responsible for the presence of dipyridamole in gallstones.

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

Dipyridamole increases the plasma levels and cardiovascular effects of adenosine. Adjustment of adenosine dosage should therefore be considered if use with dipyridamole is unavoidable.

There is evidence that the effects of acetylsalicylic acid and dipyridamole on platelet behaviour are additive.

When dipyridamole is used in combination with any substances impacting coagulation such as anticoagulants and antiplatelets, the safety profile for these medications must be observed. Addition of dipyridamole to acetylsalicylic acid does not increase the incidence of bleeding events. When dipyridamole was administered concomitantly with warfarin, bleeding was no greater in frequency or severity than that observed when warfarin was administered alone.

Dipyridamole may increase the hypotensive effect of blood pressure lowering drugs and may counteract the anticholinesterase effect of cholinesterase inhibitors thereby potentially aggravating myasthenia gravis.

Pyranistole capsules should not be taken at the same time as alcohol, as alcohol may increase the rate of release of dipyridamole from the prolonged-release preparation.

#### **4.6 Fertility, pregnancy and lactation**

##### Pregnancy

There is inadequate evidence of safety in human pregnancy, but dipyridamole has been used for many years without apparent ill-consequence. Animal studies have shown no hazard. Nevertheless, medicines should not be used in pregnancy, especially the first trimester unless the expected benefit is thought to outweigh the possible risk to the fetus (please refer to section 5.3).

##### Breast-feeding

Dipyridamole should only be used during lactation if considered essential by the physician.

##### Fertility

No studies on the effect on human fertility have been conducted with dipyridamole. Non-clinical studies with dipyridamole did not indicate direct or indirect harmful effects with respect to fertility (please refer to section 5.3).

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

No studies on the effects on the ability to drive and use machines have been performed.

However, patients should be advised that they may experience undesirable effects such as dizziness during treatment with dipyridamole. If patients experience dizziness they should avoid potentially hazardous tasks such as driving or operating machinery.

#### **4.8 Undesirable effects**

Adverse effects at therapeutic doses are usually mild and transient.

The following side effects have been reported, frequencies have been assigned based on a clinical trial (ESPS-2) in which 1654 patients received dipyridamole alone.

#### **Frequencies**

Very common  $\geq 1/10$

Common  $\geq 1/100 < 1/10$

Uncommon  $\geq 1/1,000 < 1/100$

Rare  $\geq 1/10,000 < 1/1,000$

Very rare  $< 1/10,000$

#### Blood and lymphatic system disorders

Thrombocytopenia not known

#### Immune system disorders

Hypersensitivity not known

Angioedema not known

#### Nervous system disorders

Headache very common

Dizziness very common

#### Cardiac disorders

Angina pectoris common

Tachycardia not known

#### Vascular disorders

Hypotension not known

Hot flush not known

#### Respiratory, thoracic and mediastinal disorders

Bronchospasm not known

#### Gastrointestinal disorders

Diarrhoea very common

Nausea very common

Vomiting common

#### Skin and subcutaneous tissue disorders

Rash common

Urticaria not known

#### Musculoskeletal, connective tissue and bone disorders

Myalgia common

#### Injury, poisoning and procedural complications

Post procedural haemorrhage not known

Operative haemorrhage not known

Dipyridamole has been shown to be incorporated into gallstones (please refer to section 4.4 Special warnings and precautions for 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 HPRC Pharmacovigilance, Earlsfort Terrace, IRL - Dublin 2; Tel: +353 1 6764971; Fax: +353 1 6762517.

Website: <http://www.hpra.ie/>; E-mail: [medsafety@hpra.ie](mailto:medsafety@hpra.ie).

## **4.9 Overdose**

### *Symptoms*

Due to the low number of observations, experience with dipyridamole overdose is limited. Symptoms such as feeling warm, flushes, sweating, accelerated pulse, restlessness, feeling of weakness, dizziness, drop in blood pressure and anginal complaints can be expected.

### Therapy

Symptomatic therapy is recommended. Administration of xanthine derivatives (e.g. aminophylline) may reverse the haemodynamic effects of dipyridamole overdose. ECG monitoring is advised in such a situation. Due to its wide distribution to tissues and its predominantly hepatic elimination, dipyridamole is not likely to be accessible to enhanced removal procedures.

## 5 PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Antithrombotic agents, platelet aggregation inhibitors excluding heparin, ATC code: B01AC07

Dipyridamole inhibits the uptake of adenosine into erythrocytes, platelets and endothelial cells in vitro and in vivo; the inhibition amounts to 80% at its maximum and occurs dose-dependently at therapeutic concentrations (0.5 - 2 µg/mL). Consequently, there is an increased concentration of adenosine locally to act on the platelet A<sub>2</sub>-receptor, stimulating platelet adenylate cyclase, thereby increasing platelet cAMP levels. Thus, platelet aggregation in response to various stimuli such as PAF, collagen and ADP is inhibited. Reduced platelet aggregation reduces platelet consumption towards normal levels. In addition, adenosine has a vasodilator effect and this is one of the mechanisms by which dipyridamole produces vasodilation.

Dipyridamole inhibits phosphodiesterase (PDE) in various tissues. Whilst the inhibition of cAMP-PDE is weak, therapeutic levels inhibit cGMP-PDE, thereby augmenting the increase in cGMP produced by EDRF (endothelium-derived relaxing factor, identified as NO).

Dipyridamole also stimulates the biosynthesis and release of prostacyclin by the endothelium. Dipyridamole reduces the thrombogenicity of subendothelial structures by increasing the concentration of the protective mediator 13-HODE (13-hydroxyoctadecadienic acid).

### 5.2 Pharmacokinetic properties

#### Absorption

Peak plasma concentrations are reached about 2 - 3 hours after administration. Mean peak concentrations at steady state conditions with 150 mg b.d. are 1.43 µg/mL (range 0.705 - 2.75 µg/mL), trough levels are 0.351 µg/mL (range 0.200 - 0.741 µg/mL). With a daily dose of 400 mg, the corresponding peak concentrations are 1.98 µg/mL (range 1.01 - 3.99 µg/mL); trough concentrations are 0.53 µg/mL (range 0.18 - 1.01 µg/mL). There is no clinically relevant effect of food on the pharmacokinetics of dipyridamole. The absolute bioavailability is about 70%.

As first pass removes approx. 1/3 of the dose administered, near to complete absorption of dipyridamole prolonged-release capsules can be assumed.

Various kinetic studies at steady state showed, that all pharmacokinetic parameters which are appropriate to characterise the pharmacokinetic properties of prolonged-release preparations are either equivalent or somewhat improved with dipyridamole prolonged-release capsules given b.i.d. compared to dipyridamole tablets administered t.d.s. /q.d.s.: Bioavailability is slightly greater, peak concentrations are similar; trough concentrations are considerably higher and peak trough fluctuation is reduced

#### Distribution

Owing to its high lipophilicity, log P 3.92 (n-octanol/0.1 N, NaOH), dipyridamole distributes to many organs.

Non-clinical studies indicate that dipyridamole is distributed preferentially to the liver, then to the lungs, kidneys, spleen and heart; it does not cross the blood-brain barrier to a significant extent and shows a very low placental transfer. Non-clinical data have also shown that dipyridamole can be excreted in breast milk.

Protein binding of dipyridamole is about 97 - 99%; primarily it is bound to alpha 1-acid glycoprotein and albumin.

#### Biotransformation

Metabolism of dipyridamole occurs in the liver. Dipyridamole is metabolized by conjugation with glucuronic acid to form mainly a monoglucuronide and only small amounts of diglucuronide. In plasma about 80% of the total amount is parent compound, 20% of the total amount is monoglucuronide with oral administration.

### Elimination

Dominant half-lives ranging from 2.2 to 3 hours have been calculated after the administration of dipyridamole. A prolonged terminal elimination half-life of approximately 15 h is observed. This terminal elimination phase is of relatively minor importance in that it represents a small proportion of the total AUC, as evidenced by the fact that steady-state is achieved within 2 days with both t.d.s. and q.d.s., regimens. There is no significant accumulation of the drug with repeated dosing. Renal excretion of parent compound is negligible (< 0.5%). Urinary excretion of the glucuronide metabolite is low (5%), the metabolites are mostly (about 95%) excreted via the bile into the faeces, with some evidence of entero-hepatic recirculation. Total clearance is approx. 250 mL/min and mean residence time is approx. 8 h (resulting from an intrinsic MRT of approx. 6.4 h and a mean time of absorption of 1.4 h).

### Linearity/non-linearity

The dose linearity of dipyridamole after oral b.i.d. administration of the prolonged release capsules containing 150 and 200 mg was demonstrated.

### Elderly

Plasma concentrations (determined as AUC) in elderly subjects (> 65 years) were about 50% higher for tablet treatment and about 30% higher with intake of dipyridamole 200 mg prolonged release capsules than in young (<55 years) subjects. The difference is caused mainly by reduced clearance; absorption appears to be similar. A similar increase in plasma concentrations in elderly patients was observed in the ESPS2 study.

### Hepatic impairment

Patients with hepatic insufficiency show no change in plasma concentrations of dipyridamole, but an increase of (pharmacodynamically inactive) glucuronides. It is suggested to dose dipyridamole without restriction as long as there is no clinical evidence of liver failure.

### Renal impairment

Since renal excretion is very low (5%), no change in pharmacokinetics is to be expected in cases of renal insufficiency. In the ESPS2 trial, in patients with creatinine clearances ranging from about 15 mL/min to >100 mL/min, no changes were observed in the pharmacokinetics of dipyridamole or its glucuronide metabolite if data were corrected for differences in age.

## **5.3 Preclinical safety data**

Dipyridamole has been extensively investigated in animal models and no clinically significant findings have been observed at doses equivalent to therapeutic doses in humans.

## **6 PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

#### Capsule contents

Tartaric acid  
Povidone  
Co-povidone  
Talc  
Isopropyl alcohol  
Hypromellose  
Simeticone emulsion  
Butylated methacrylate copolymer  
Hypromellose phthalate  
Stearic acid  
Triacetin  
Acetone

#### Hard gelatin capsules

Gelatin  
Titanium dioxide (E171)

#### Printing ink

Shellac

Propylene glycol  
Black iron oxide (E172)  
Potassium hydroxide

## **6.2 Incompatibilities**

Not applicable.

## **6.3 Shelf life**

3 years.

## **6.4 Special precautions for storage**

This medicinal product does not require any special temperature storage conditions.

Store in the original package in order to protect from moisture. Keep the bottle tightly closed.

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

HDPE bottles with child-resistant, polypropylene closures with a translucent inner liner. Each bottle pack contains either 1 or 2 silica gel bags plus a molecular sieve bag.

Bottle packs contain 30 or 60 capsules. Not all pack sizes may be marketed.

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

No special requirements.

## **7 MARKETING AUTHORISATION HOLDER**

Renata Pharmaceuticals (Ireland) Limited  
12 Crowe Street  
Dundalk Co Louth  
Ireland, A91 NN29

## **8 MARKETING AUTHORISATION NUMBER**

PA22865/001/001

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

Date of first authorisation: 6<sup>th</sup> July 2018

Date of renewal: 18<sup>th</sup> May 2023

## **10 DATE OF REVISION OF THE TEXT**

May 2024