

SAMENVATTING VAN DE PRODUCTKENMERKEN

1. NAAM VAN HET GENEESMIDDEL

Grenalvon 0.5 mg harde capsules

Grenalvon 1 mg harde capsules

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each hard capsule contains 0.5 mg anagrelide (as anagrelide hydrochloride monohydrate).

Each hard capsule contains 1 mg anagrelide (as anagrelide hydrochloride monohydrate).

Excipient with known effect:

Each hard capsule contains lactose monohydrate (28.0 mg) and lactose (32.9 mg).

Each hard capsule contains lactose monohydrate (56.1 mg) and lactose (65.8 mg).

For the full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Hard capsule.

A hard capsule (size 4, 14.3×5.3 mm) with an opaque white body and cap. The capsule is filled with white to off-white powder.

A hard capsule (size 4, 14.3×5.3 mm) with a grey body and cap. The capsule is filled with white to off-white powder.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Anagrelide is indicated for the reduction of elevated platelet counts in at risk essential thrombocythaemia (ET) patients who are intolerant to their current therapy or whose elevated platelet counts are not reduced to an acceptable level by their current therapy.

An at-risk patient

An at-risk essential thrombocythaemia patient is defined by one or more of the following features:

- > 60 years of age or
- a platelet count $> 1,000 \times 10^9/l$ or
- a history of thrombo-haemorrhagic events.

4.2 Posology and method of administration

Treatment with anagrelide should be initiated by a clinician with experience in the management of essential thrombocythaemia.

Posology

The recommended starting dose of anagrelide is 1 mg/day, which should be administered orally in two divided doses (0.5 mg/dose).

The starting dose should be maintained for at least one week. After one week the dose may be titrated, on an individual basis, to achieve the lowest effective dose required to reduce and/or maintain a platelet count below $600 \times 10^9/l$ and ideally at levels between $150 \times 10^9/l$ and $400 \times 10^9/l$. The dose increment must not exceed more than 0.5 mg/day in any one-week and the recommended maximum single dose should not exceed 2.5 mg (see section 4.9). During clinical development doses of 10 mg/day have been used.

The effects of treatment with anagrelide must be monitored on a regular basis (see section 4.4). If the starting dose is > 1 mg/day, platelet counts should be performed every two days during the first week of treatment and at least weekly thereafter until a stable maintenance dose is reached. Typically, a fall in the platelet count will be observed within 14 to 21 days of starting treatment and in most patients an adequate therapeutic response will be observed and maintained at a dose of 1 to 3 mg/day (for further information on the clinical effects, refer to section 5.1).

Elderly

The observed pharmacokinetic differences between elderly and young patients with ET (see section 5.2) do not warrant using a different starting regimen or different dose titration step to achieve an individual patient-optimised anagrelide regimen.

During clinical development, approximately 50% of the patients treated with anagrelide were over 60 years of age and no age specific alterations in dose were required in these patients. However, as expected, patients in this age group had twice the incidence of serious adverse events (mainly cardiac).

Renal impairment

There are limited pharmacokinetic data for this patient population. The potential risks and benefits of anagrelide therapy in a patient with impairment of renal function should be assessed before treatment is commenced (see section 4.3).

Hepatic impairment

There are limited pharmacokinetic data for this patient population. However, hepatic metabolism represents the major route of anagrelide clearance and liver function may therefore be expected to influence this process. Therefore, it is recommended that patients with moderate or severe hepatic impairment are not treated with anagrelide. The potential risks and benefits of anagrelide therapy in a patient with mild impairment of hepatic function should be assessed before treatment is commenced (see sections 4.3 and 4.4).

Paediatric population

The safety and efficacy of anagrelide in children have not been established. The experience in children and adolescents is very limited; anagrelide should be used in this patient group with caution. In the absence of specific paediatric guidelines, WHO diagnostic criteria for adult diagnosis of ET are considered to be of relevance to the paediatric population.

Diagnostic guidelines for essential thrombocythemia should be followed carefully and diagnosis reassessed periodically in cases of uncertainty, with effort made to distinguish from hereditary or secondary thrombocytosis, which may include genetic analysis and bone marrow biopsy.

Typically, cytoreductive therapy is considered in high-risk paediatric patients.

Anagrelide treatment should only be initiated when the patient shows signs of disease progression or suffers from thrombosis. If treatment is initiated, the benefits and risks of treatment with anagrelide must be monitored regularly and the need for ongoing treatment evaluated periodically.

Platelet targets are assigned on an individual patient basis by the treating physician.

Discontinuation of treatment should be considered in paediatric patients who do not have a satisfactory treatment response after approximately 3 months (see section 4.4).

Currently available data are described in sections 4.4, 4.8, 5.1 and 5.2, but no recommendation on a posology can be made.

Method of administration

For oral use. The capsules must be swallowed whole. Do not crush or dilute the contents in a liquid.

4.3 Contraindications

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

Patients with moderate or severe hepatic impairment.

Patients with moderate or severe renal impairment (creatinine clearance < 50 ml/min).

4.4 Special warnings and precautions for use

Hepatic impairment

The potential risks and benefits of anagrelide therapy in a patient with mild impairment of hepatic function should be assessed before treatment is commenced. It is not recommended in patients with elevated transaminases (> 5-times the upper limit of normal) (see sections 4.2 and 4.3).

Renal impairment

The potential risks and benefits of anagrelide therapy in a patient with impairment of renal function should be assessed before treatment is commenced (see sections 4.2 and 4.3).

Thrombotic risk

Abrupt treatment discontinuation should be avoided due to the risk of sudden increase in platelet counts, which may lead to potentially fatal thrombotic complications, such as cerebral infarction. Patients should be advised how to recognize early signs and symptoms suggestive of thrombotic complications, such as cerebral infarction, and if symptoms occur to seek medical assistance.

Treatment discontinuation

In the event of dosage interruption or treatment withdrawal, the rebound in platelet count is variable, but the platelet count will start to increase within 4 days of stopping treatment with anagrelide and will return to pre-treatment levels within 10 to 14 days, possibly rebounding above baseline values. Therefore, platelets should be monitored frequently (see section 4.2).

Monitoring

Therapy requires close clinical supervision of the patient which will include a full blood count (haemoglobin and white blood cell and platelet counts), assessment of liver function (ALT and AST), renal function (serum creatinine and urea) and electrolytes (potassium, magnesium and calcium).

Cardiovascular

Serious cardiovascular adverse events including cases of torsade de pointes, ventricular tachycardia, cardiomyopathy, cardiomegaly and congestive heart failure have been reported (see section 4.8).

Caution should be taken when using anagrelide in patients with known risk factors for prolongation of the QT interval, such as congenital long QT syndrome, a known history of acquired QTc prolongation, medicinal products that can prolong QTc interval and hypokalaemia.

Care should also be taken in populations that may have a higher maximum plasma concentration (C_{max}) of anagrelide or its active metabolite, 3-hydroxy-anagrelide, e.g. hepatic impairment or use with CYP1A2 inhibitors (see section 4.5).

Close monitoring for an effect on the QTc interval is advisable.

A pre-treatment cardiovascular examination, including a baseline ECG and echocardiography is recommended for all patients prior to initiating therapy with anagrelide. All patients should be monitored regularly during treatment (e.g. ECG or echocardiography) for evidence of cardiovascular effects that may require further cardiovascular examination and investigation. Hypokalaemia or hypomagnesaemia must be corrected prior to anagrelide administration and should be monitored periodically during therapy.

Anagrelide is an inhibitor of cyclic AMP phosphodiesterase III and because of its positive inotropic and chronotropic effects, anagrelide should be used with caution in patients of any age with known or suspected heart disease. Moreover, serious cardiovascular adverse events have also occurred in patients without suspected heart disease and with normal pre-treatment cardiovascular examination.

Anagrelide should only be used if the potential benefits of therapy outweigh the potential risks.

Pulmonary hypertension

Cases of pulmonary hypertension have been reported in patients treated with anagrelide. Patients should be evaluated for signs and symptoms of underlying cardiopulmonary disease prior to initiating and during anagrelide therapy.

Paediatric population

Very limited data are available on the use of anagrelide in the paediatric population and anagrelide should be used in this patient group with caution (see sections 4.2, 4.8, 5.1 and 5.2).

As with the adult population, a full blood count and assessment of cardiac, hepatic and renal function should be undertaken before treatment and regularly during treatment. The disease may progress to myelofibrosis or AML. Although the rate of such progression is not known, children have a longer disease course and may, therefore, be at increased risk for malignant transformation, relative to adults.

Children should be monitored regularly for disease progression according to standard clinical practices, such as physical examination, assessment of relevant disease markers and bone marrow biopsy.

Any abnormalities should be evaluated promptly and appropriate measures taken, which may also include dose reduction, interruption or discontinuation.

Clinically relevant interactions

Anagrelide is an inhibitor of cyclic AMP phosphodiesterase III (PDE III). Concomitant use of anagrelide with other PDE III inhibitors such as milrinone, amrinone, enoximone, olprinone and cilostazol is not recommended.

Use of concomitant anagrelide and acetylsalicylic acid has been associated with major haemorrhagic events (see section 4.5).

Excipients

Grenalvon contains lactose. Patients with rare hereditary problems of galactose intolerance, the total lactase deficiency or glucose-galactose malabsorption should not take this medicinal product.

Grenalvon contains less than 1 mmol sodium (23 mg) per capsule, that is to say essentially “sodium-free”.

4.5 Interaction with other medicinal products and other forms of interaction

Limited pharmacokinetic and/or pharmacodynamic studies investigating possible interactions between anagrelide and other medicinal products have been conducted.

Effects of other active substances on anagrelide

- *In vivo* interaction studies in humans have demonstrated that digoxin and warfarin do not affect the pharmacokinetic properties of anagrelide.

CYP1A2 inhibitors

- Anagrelide is primarily metabolised by CYP1A2. It is known that CYP1A2 is inhibited by several medicinal products, including fluvoxamine and enoxacin, and such medicinal products could theoretically adversely influence the clearance of anagrelide.

CYP1A2 inducers

- CYP1A2 inducers (such as omeprazole) could decrease the exposure of anagrelide (see section 5.2). The consequences on the safety and efficacy profile of anagrelide are not established. Therefore, clinical and biological monitoring is recommended in patients taking concomitant CYP1A2 inducers. If needed, anagrelide dose adjustment could be made.

Effects of anagrelide on other active substances

- Anagrelide demonstrates some limited inhibitory activity towards CYP1A2 which may present a theoretical potential for interaction with other co-administered medicinal products sharing that clearance mechanism e.g. theophylline.
- Anagrelide is an inhibitor of PDE III. The effects of medicinal products with similar properties such as the inotropes milrinone, enoximone, amrinone, olprinone and cilostazol may be exacerbated by anagrelide.
- *In vivo* interaction studies in humans have demonstrated that anagrelide does not affect the pharmacokinetic properties of digoxin or warfarin.
- At the doses recommended for use in the treatment of essential thrombocythaemia, anagrelide may potentiate the effects of other medicinal products that inhibit or modify platelet function e.g. acetylsalicylic acid.
- A clinical interaction study performed in healthy subjects showed that co-administration of repeat-dose anagrelide 1 mg once daily and acetylsalicylic acid 75 mg once daily may enhance the anti-platelet aggregation effects of each active substance compared with administration of acetylsalicylic acid alone. In some patients with ET concomitantly treated by acetylsalicylic acid and anagrelide, major haemorrhages occurred. Therefore, the potential risks of the concomitant use of anagrelide with acetylsalicylic acid should be assessed, particularly in patients with a high risk profile for haemorrhage before treatment is initiated.
- Anagrelide may cause intestinal disturbance in some patients and compromise the absorption of hormonal oral contraceptives.

Food interactions

- Food delays the absorption of anagrelide, but does not significantly alter systemic exposure.
- The effects of food on bioavailability are not considered clinically relevant to the use of anagrelide.

Paediatric population

Interaction studies have only been performed in adults.

4.6 Fertility, pregnancy and lactation

Women of child-bearing potential

Women of child-bearing potential should use adequate birth-control measures during treatment with anagrelide.

Pregnancy

There are no adequate data from the use of anagrelide in pregnant women. Studies in animals have shown reproductive toxicity (see section 5.3). The potential risk for humans is unknown. Therefore anagrelide is not recommended during pregnancy.

If anagrelide is used during pregnancy, or if the patient becomes pregnant while using the medicinal product, she should be advised of the potential risk to the foetus.

Breast-feeding

It is unknown whether anagrelide/metabolites are excreted in human milk. Available data in animals have shown excretion of anagrelide/metabolites in milk. A risk to the newborn/infant cannot be excluded. Breast-feeding should be discontinued during treatment with anagrelide.

Fertility

No human data on the effect of anagrelide on fertility are available. In male rats, there was no effect on fertility or reproductive performance with anagrelide. In female rats, using doses in excess of the therapeutic range, anagrelide disrupted implantation (see section 5.3).

4.7 Effects on ability to drive and use machines

In clinical development, dizziness was commonly reported. Patients are advised not to drive or operate machinery while taking anagrelide if dizziness is experienced.

4.8 Undesirable effects

Summary of the safety profile

The safety of anagrelide has been examined in 4 open label clinical studies. In 3 of the studies 942 patients who received anagrelide at a mean dose of approximately 2 mg/day were assessed for safety. In these studies 22 patients received anagrelide for up to 4 years.

In the later study 3,660 patients who received anagrelide at a mean dose of approximately 2 mg/day were assessed for safety. In this study 34 patients received anagrelide for up to 5 years.

The most commonly reported adverse reactions associated with anagrelide were headache occurring at approximately 14%, palpitations occurring at approximately 9%, fluid retention and nausea both occurring at approximately 6%, and diarrhoea occurring at 5%. These adverse drug reactions are expected based on the pharmacology of anagrelide (inhibition of PDE III). Gradual dose titration may help diminish these effects (see section 4.2).

Tabulated list of adverse reactions

Adverse reactions arising from clinical studies, post-authorisation safety studies and spontaneous reports are presented in the table below. Within the system organ classes they are listed under the following headings: Very common ($\geq 1/10$), common ($\geq 1/100$ to $< 1/10$), uncommon ($\geq 1/1,000$ to $< 1/100$), rare ($\geq 1/10,000$ to $< 1/1,000$), very rare ($< 1/10,000$), not known (cannot be estimated from the available data). Within each frequency grouping, adverse reactions are presented in order of decreasing seriousness.

| MedDRA System Organ Class | Frequency of adverse reactions | | | | |
|---|--------------------------------|--|--|---|--|
| | Very common | Common | Uncommon | Rare | Not known |
| Blood and lymphatic system disorders | | Anaemia | Pancytopenia Thrombocytopenia Haemorrhage Ecchymosis | | |
| Metabolism and nutrition disorders | | Fluid retention | Oedema Weight loss | Weight gain | |
| Nervous system disorders | Headache | Dizziness | Depression Amnesia Confusion Insomnia Paraesthesia Hypoaesthesia Nervousness Dry mouth | Migraine Dysarthria Somnolence Abnormal coordination | Cerebral infarction* |
| Eye disorders | | | | Diplopia Vision abnormal | |
| Ear and labyrinth disorders | | | | Tinnitus | |
| Cardiac disorders | | Tachycardia Palpitations | Ventricular tachycardia Congestive heart failure Atrial fibrillation Supraventricular tachycardia Arrhythmia Hypertension Syncope | Myocardial infarction Cardiomyopathy Cardiomegaly Pericardial effusion Angina pectoris Postural hypotension Vasodilatation Prinzmetal angina | Torsade de pointes |
| Respiratory, thoracic and mediastinal disorders | | | Pulmonary hypertension Pneumonia Pleural effusion Dyspnoea Epistaxis | Pulmonary infiltrates | Interstitial lung disease including pneumonitis and allergic alveolitis |
| Gastrointestinal disorders | | Diarrhoea Vomiting Abdominal pain Nausea Flatulence | Gastrointestinal haemorrhage Pancreatitis Anorexia Dyspepsia Constipation | Colitis Gastritis Gingival bleeding | |

| | | | | | |
|--|--|---------|--|---------------------------------------|------------------------------|
| | | | Gastrointestinal disorder | | |
| Hepatobiliary disorders | | | Hepatic enzymes increased | | Hepatitis |
| Skin and subcutaneous tissue disorders | | Rash | Alopecia Pruritus Skin discoloration | Dry skin | |
| Musculoskeletal and connective tissue disorders | | | Arthralgia Myalgia Back pain | | |
| Renal and urinary disorders | | | Impotence | Renal failure Nocturia | Tubulointerstitial nephritis |
| General disorders and administration site conditions | | Fatigue | Chest pain Fever Chills Malaise Weakness | Flu-like syndrome Pain Asthenia | |
| Investigations | | | | Blood creatinine increased | |

* Cerebral infarction (see section 4.4 Thrombotic Risk)

Paediatric population

48 patients aged 6 – 17 years (19 children and 29 adolescents) have received anagrelide for up to 6.5 years either in clinical studies or as part of a disease registry (see section 5.1). The majority of adverse events observed were among those listed in the SmPC. However, safety data are limited and do not allow a meaningful comparison between adult and paediatric patients to be made (see section 4.4).

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 national reporting system listed in [Appendix V](#).

4.9 Overdose

Post-marketing case reports of intentional overdose with anagrelide have been received. Reported symptoms include sinus tachycardia and vomiting. Symptoms resolved with conservative management.

Anagrelide, at higher than recommended doses, has been shown to produce reductions in blood pressure with occasional instances of hypotension. A single 5 mg dose of anagrelide can lead to a fall in blood pressure usually accompanied by dizziness.

A specific antidote for anagrelide has not been identified. In case of overdose, close clinical supervision of the patient is required; this includes monitoring of the platelet count

for thrombocytopenia. Dose should be decreased or stopped, as appropriate, until the platelet count returns to within the normal range (see section 4.4).

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Other antineoplastic agents;
ATC code: L01XX35.

Mechanism of action

The precise mechanism by which anagrelide reduces blood platelet count is unknown. In cell culture studies, anagrelide suppressed expression of transcription factors including GATA-1 and FOG-1 required for megakaryocytopoiesis, ultimately leading to reduced platelet production.

In vitro studies of human megakaryocytopoiesis established that anagrelide's inhibitory actions on platelet formation in man are mediated via retardation of maturation of megakaryocytes, and reducing their size and ploidy. Evidence of similar *in vivo* actions was observed in bone marrow biopsy samples from treated patients.

Anagrelide is an inhibitor of cyclic AMP phosphodiesterase III.

Clinical efficacy and safety

The safety and efficacy of anagrelide as a platelet lowering agent have been evaluated in four open-label, non-controlled clinical trials (study numbers 700-012, 700-014, 700-999 and 13970-301) including more than 4,000 patients with myeloproliferative neoplasms (MPNs). In patients with essential thrombocythaemia complete response was defined as a decrease in platelet count to $\leq 600 \times 10^9/l$ or a $\geq 50\%$ reduction from baseline and maintenance of the reduction for at least 4 weeks. In studies 700-012, 700-014, 700-999 and study 13970-301 the time to complete response ranged from 4 to 12 weeks. Clinical benefit in terms of thrombo-haemorrhagic events has not been convincingly demonstrated.

Effects on heart rate and QTc interval

The effect of two dose levels of anagrelide (0.5 mg and 2.5 mg single doses) on the heart rate and QTc interval was evaluated in a double-blind, randomised, placebo- and active-controlled, cross-over study in healthy adult men and women.

A dose-related increase in heart rate was observed during the first 12 hours, with the maximum increase occurring around the time of maximal concentrations. The maximum change in mean heart rate occurred at 2 hours after administration and was +7.8 beats per minute (bpm) for 0.5 mg and +29.1 bpm for 2.5 mg.

A transient increase in mean QTc was observed for both doses during periods of increasing heart rate and the maximum change in mean QTcF (Fridericia correction) was +5.0 msec occurring at 2 hours for 0.5 mg and +10.0 msec occurring at 1 hour for 2.5 mg.

Paediatric population

In an open-label clinical study in 8 children and 10 adolescents (including patients who were anagrelide treatment naïve or who had been receiving anagrelide for up to 5 years pre-study), median platelet counts were decreased to controlled levels after 12 weeks of treatment. The average daily dose tended to be higher in adolescents.

In a paediatric registry study, median platelet counts were reduced from diagnosis and maintained for up to 18 months in 14 paediatric patients with ET (4 children, 10 adolescents) with anagrelide treatment. In earlier, open-label studies, median platelet count reductions were observed in 7 children and 9 adolescents treated for between 3 months and 6.5 years.

The average total daily dose of anagrelide across all studies in paediatric patients with ET was highly variable, but overall the data suggest that adolescents could follow similar starting and maintenance doses to adults and that a lower starting dose of 0.5 mg/day would be more appropriate for children over 6 years (see sections 4.2, 4.4, 4.8, 5.2). In all paediatric patients, careful titration to a patient-specific daily dose is needed.

5.2 Pharmacokinetic properties

Absorption

Following oral administration of anagrelide in man, at least 70% is absorbed from the gastrointestinal tract. In fasted subjects, peak plasma levels occur about 1 hour after administration. Pharmacokinetic data from healthy subjects established that food decreases the C_{max} of anagrelide by 14%, but increases the AUC by 20%. Food also decreased the C_{max} of the active metabolite, 3-hydroxy-anagrelide, by 29%, although it had no effect on the AUC.

Biotransformation

Anagrelide is primarily metabolised by CYP1A2 to form, 3-hydroxy anagrelide, which is further metabolised via CYP1A2 to the inactive metabolite, 2-amino-5, 6-dichloro-3, 4-dihydroquinazoline.

The effect of omeprazole, a CYP1A2 inducer, on the pharmacokinetics of anagrelide was investigated in 20 healthy adult subjects following multiple, once daily 40-mg doses. The results showed that in the presence of omeprazole, $AUC_{(0-\infty)}$, $AUC_{(0-t)}$, and C_{max} of anagrelide were reduced by 27%, 26%, and 36%, respectively; and the corresponding values for 3-hydroxy anagrelide, a metabolite of anagrelide, were reduced by 13%, 14%, and 18%, respectively.

Elimination

The plasma half-life of anagrelide is short, approximately 1.3 hours and as expected from its half-life, there is no evidence for anagrelide accumulation in the plasma. Less than 1% is recovered in the urine as anagrelide. The mean recovery of 2-amino-5, 6-dichloro-3, 4-dihydroquinazoline in urine is approximately 18 – 35% of the administered dose.

Additionally these results show no evidence of auto-induction of the anagrelide clearance.

Linearity

Dose proportionality has been found in the dose range 0.5 mg to 2 mg.

Paediatric population

Pharmacokinetic data from exposed fasting children and adolescents (age range 7 – 16 years) with essential thrombocythaemia indicate that dose normalised exposure, C_{max} and AUC, of anagrelide tended to be higher in children/adolescents compared with adults. There was also a trend to higher dose-normalised exposure to the active metabolite.

Elderly

Pharmacokinetic data from fasting elderly patients with ET (age range 65 – 75 years) compared to fasting adult patients (age range 22 – 50 years) indicate that the C_{max} and AUC of anagrelide were 36% and 61% higher respectively in elderly patients, but that the C_{max} and AUC of the active metabolite, 3-hydroxy anagrelide, were 42% and 37% lower respectively in the elderly patients. These differences were likely to be caused by lower pre-systemic metabolism of anagrelide to 3-hydroxy anagrelide in the elderly patients.

5.3 Preclinical safety data

Repeated dose toxicity

Following repeated oral administration of anagrelide in dogs, subendocardial haemorrhage and focal myocardial necrosis was observed at 1 mg/kg/day or higher in males and females with males being more sensitive. The no observed effect level (NOEL) for male dogs (0.3 mg/kg/day) corresponds to 0.1-, 0.1-, and 1.6-fold the AUC in humans for anagrelide at 2 mg/day, and the metabolites BCH24426 and RL603, respectively.

Reproductive toxicology

Fertility

In male rats, anagrelide at oral doses up to 240 mg/kg/day (> 1,000-times a 2 mg/day dose, based on body surface area) was found to have no effect on fertility and reproductive performance. In female rats increases in pre- and post-implantation losses and a decrease in the mean number of live embryos was observed at 30 mg/kg/day. The NOEL (10 mg/kg/day) to this effect was 143, 12 and 11-fold higher than the AUC in humans administered a dose of anagrelide 2 mg/day, and the metabolites BCH24426 and RL603, respectively.

Embryofoetal development studies

Maternally toxic doses of anagrelide in rats and rabbits were associated with increased embryo resorption and foetal mortality.

In a pre- and post-natal development study in female rats, anagrelide at oral doses of ≥ 10 mg/kg produced a non-adverse increase in gestational duration. At the NOEL dose (3 mg/kg/day), the AUCs for anagrelide and the metabolites BCH24426 and RL603 were 14, 2 and 2-fold higher than the AUC in humans administered an oral dose of anagrelide 2 mg/day.

Anagrelide at ≥ 60 mg/kg increased parturition time and mortality in the dam and foetus respectively. At the NOEL dose (30 mg/kg/day), the AUCs for anagrelide and the metabolites BCH24426 and RL603 were 425-, 31- and 13-fold higher than the AUC in humans administered an oral dose of anagrelide 2 mg/day, respectively.

Mutagenic and carcinogenic potential

Studies on the genotoxic potential of anagrelide did not identify any mutagenic or clastogenic effects.

In a two-year rat carcinogenicity study, non-neoplastic and neoplastic findings were observed and related or attributed to an exaggerated pharmacological effect. Among them, the incidence of adrenal pheochromocytomas was increased relative to control in males at all dose levels (≥ 3 mg/kg/day) and in females receiving 10 mg/kg/day and above. The lowest dose in males (3 mg/kg/day) corresponds to 37-times the human AUC exposure after a 1 mg twice daily dose. Uterine adenocarcinomas, of epigenetic origin, could be related to an enzyme induction of CYP1 family. They were observed in females receiving 30 mg/kg/day, corresponding to 572-times the human AUC exposure after a 1 mg twice daily dose.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Capsule contents

Lactose monohydrate
Croscarmellose sodium
Povidone (K29/32)
Lactose
Cellulose, microcrystalline
Magnesium stearate

Capsule shell

Gelatin
Titanium dioxide (E171)

Capsule shell

Gelatin
Titanium dioxide (E171)
Black iron oxide (E172)

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

3 years.

6.4 Special precautions for storage

Do not store above 30 °C.

Store in the original package in order to protect from light and moisture.

Do not store above 30 °C.

Store in the original package in order to protect from moisture.

6.5 Nature and contents of container

High-density polyethylene (HDPE) bottles with child-resistant polypropylene (PP) closures and desiccant containing 42 or 100 hard capsules.

Not all pack sizes may be marketed.

6.6 Special precautions for disposal and other handling

No special requirements.

7. HOUDER VAN DE VARGUNNING VOOR HET IN DE HANDEL BRENGEN

Zentiva k.s., U Kabelovny 130, 102 37 Praag 10 – Dolní Měcholupy, Tsjechië

8. NUMMER(S) VAN DE VERGUNNING VOOR HET IN DE HANDEL BRENGEN

Grenalvon 0,5 mg harde capsules: RVG 120299

Grenalvon 1 mg harde capsules: RVG 120300

9. DATUM VAN EERSTE VERLENING VAN DE VERGUNNING/VERLENGING VAN DE VERGUNNING

Datum van eerste verlening van de vergunning: 26 februari 2018

10. DATUM VAN HERZIENING VAN DE TEKST

Laatste gedeeltelijke wijziging betreft de rubrieken 4.4 en 4.8: 21 september 2022