

Summary of Product Characteristics

1 NAME OF THE MEDICINAL PRODUCT

Lansoprazole Krka 30 mg Gastro-resistant Capsules, hard

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each capsule contains 30 mg of lansoprazole.

Excipient with known effect:

Each 30 mg capsule contains 161 mg of sucrose

For the full list of excipients, see section 6.1.

3 PHARMACEUTICAL FORM

Gastro-resistant capsule, hard.

White gastro-resistant gelatin capsules. Each capsule contains white to light brown or lightly pink coloured enteric-coated pellets.

4 CLINICAL PARTICULARS

4.1 Therapeutic Indications

- Treatment of duodenal and gastric ulcer
- Treatment of reflux oesophagitis
- Prophylaxis of reflux oesophagitis
- Eradication of *Helicobacter pylori* (*H. pylori*) concurrently given with appropriate antibiotic therapy for treatment of *H. pylori*-associated ulcers
- Treatment of NSAID-associated benign gastric and duodenal ulcers in patients requiring continued NSAID-treatment
- Prophylaxis of NSAID-associated gastric ulcers and duodenal ulcers in patients at risk (see section 4.2) requiring continued therapy
- Symptomatic gastro-oesophageal reflux disease
- Zollinger-Ellison syndrome

Lansoprazole Krka is indicated in adults.

4.2 Posology and method of administration

Posology

For optimal effect, Lansoprazole Krka should be taken once daily in the morning, except when used for *H. pylori* eradication when treatment should be twice a day, once in the morning and once in the evening.

Treatment of duodenal ulcer:

The recommended dose is 30 mg once daily for 2 weeks. In patients not fully healed within this time, the medication is continued at the same dose for another 2 weeks.

Treatment of gastric ulcer:

The recommended dose is 30 mg once daily for 4 weeks. The ulcer usually heals within 4 weeks, but in patients not fully healed within this time, the medication may be continued at the same dose for another 4 weeks.

Reflux oesophagitis:

The recommended dose is 30 mg once daily for 4 weeks. In patients not fully healed within this time, the treatment may be continued at the same dose for another 4 weeks.

Prophylaxis of reflux oesophagitis:

15 mg once daily. The dose may be increased up to 30 mg daily as necessary.

Eradication of *Helicobacter pylori*:

When selecting appropriate combination therapy consideration should be given to official local guidance regarding bacterial resistance, duration of treatment, (most commonly 7 days but sometimes up to 14 days), and appropriate use of antibacterial agents.

The recommended dose is 30 mg of Lansoprazole Krka twice daily for 7 days in combination with one of the following:
clarithromycin 250-500 mg twice daily + amoxicillin 1 g twice daily
clarithromycin 250 mg twice daily + metronidazole 400-500 mg twice daily

H. pylori eradication rates of up to 90%, are obtained when clarithromycin is combined with lansoprazole and amoxicillin or metronidazole.

Six months after successful eradication treatment, the risk of re-infection is low and relapse is therefore unlikely.

Use of a regimen including lansoprazole 30 mg twice daily, amoxicillin 1 g twice daily and metronidazole 400-500 mg twice daily has also been examined. Lower eradication rates were seen using this combination than in regimens involving clarithromycin. It may be suitable for those who are unable to take clarithromycin as part of an eradication therapy, when local resistance rates to metronidazole are low.

Treatment of NSAID associated benign gastric and duodenal ulcers in patients requiring continued NSAID treatment:

30 mg once daily for 4 weeks. In patients not fully healed the treatment may be continued for another 4 weeks. For patients at risk or with ulcers that are difficult to heal, longer course of treatment and/or a higher dose should probably be used.

Prophylaxis of NSAID associated gastric and duodenal ulcer in patients at risk (such as >65 or history of gastric or duodenal ulcer) requiring prolonged NSAID treatment:

15 mg once daily. If the treatment fails the dose 30 mg once daily should be used.

Symptomatic gastro-oesophageal reflux disease:

The recommended dose is 15 mg or 30 mg once daily. Relief of symptoms is obtained rapidly. Individual adjustment of dosage should be considered. If the symptoms are not relieved within 4 weeks with a daily dose of 30 mg, further examinations are recommended.

Zollinger-Ellison syndrome:

The recommended initial dose is 60 mg once daily. The dose should be individually adjusted and the treatment should be continued for as long as necessary. Daily doses of up to 180 mg have been used. If the required daily dose exceeds 120 mg, it should be given in two divided doses.

Renal impairment

There is no need for a dose adjustment in patients with impaired renal function.

Hepatic impairment

Patients with moderate or severe liver disease should be kept under supervision and a 50% reduction of the daily dose is recommended (see section 4.4 and 5.2).

Elderly

Due to delayed clearance of lansoprazole in the older people an adjustment of dose may be necessary based on individual requirements. A daily dose of 30 mg should not be exceeded in the older people unless there are compelling clinical indications.

Paediatric population

The use of lansoprazole is not recommended in children as clinical data are limited (see also section 5.2). Treatment of small children below one year of age should be avoided as available data have not shown beneficial effects in the treatment of gastro-oesophageal reflux disease.

Method of administration

Lansoprazole Krka should be taken at least 30 minutes before food (see section 5.2). Capsules should be swallowed whole with liquid. For patients with difficulty swallowing; the capsules may be emptied, but the contents may not be chewed or ground.

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

In common with other anti-ulcer therapies, the possibility of malignant gastric tumour should be excluded when treating a gastric ulcer with lansoprazole because lansoprazole can mask the symptoms and delay the diagnosis.

Co-administration of lansoprazole is not recommended with HIV protease inhibitors for which absorption is dependent on acidic intragastric pH, such as atazanavir and nelfinavir, due to significant reduction in their bioavailability (see section 4.5).

Influence on Vitamin B12 absorption

Lansoprazole, as all acid-blocking medicines, may reduce the absorption of vitamin B12 (cyanocobalamin) due to hypo- or achlorhydria. This should be considered in patients with reduced body stores or risk factors for reduced vitamin B12 absorption on long term therapy or if respective symptoms are observed.

Lansoprazole should be used with caution in patients with moderate and severe hepatic dysfunction (see section 4.2 and 5.2).

Lansoprazole, like all proton pump inhibitors (PPIs), might increase the counts of bacteria normally present in the gastrointestinal tract. This may increase the risk of gastrointestinal infections caused by bacteria such as *Salmonella*, *Campylobacter*, and *Clostridium difficile*.

In patients suffering from gastro-duodenal ulcers, the possibility of *H. pylori* infection as an etiological factor should be considered.

If lansoprazole is used in combination with antibiotics for eradication therapy of *H. pylori*, then the instructions for the use of these antibiotics should also be followed.

Because of limited safety data for patients on maintenance treatment for longer than one year, regular review of the treatment and a thorough benefit-risk assessment should regularly be performed in these patients.

Very rarely cases of colitis have been reported in patients taking lansoprazole. Therefore, in the case of severe and/or persistent diarrhoea, discontinuation of therapy should be considered.

The treatment for the prevention of peptic ulceration of patients in need of continuous NSAID treatment should be restricted to high risk patients (e.g. previous gastrointestinal bleeding, perforation or ulcer, advanced age, concomitant use of medication known to increase the likelihood of upper GI adverse events [e.g. corticosteroids or anticoagulants], the presence of a serious co-morbidity factor or the prolonged use of NSAID maximum recommended doses).

Severe hypomagnesaemia has been reported in patients treated with PPIs like lansoprazole for at least three months, and in most cases for a year. Serious manifestations of hypomagnesaemia such as fatigue, tetany, delirium, convulsions, dizziness and ventricular arrhythmia can occur but they may begin insidiously and be overlooked. In most affected patients, hypomagnesaemia improved after magnesium replacement and discontinuation of the PPI.

For patients expected to be on prolonged treatment or who take PPIs with digoxin or drugs that may cause hypomagnesaemia (e.g., diuretics), health care professionals should consider measuring magnesium levels before starting PPI treatment and periodically during treatment.

Proton pump inhibitors, especially if used in high doses and over long durations (>1 year), may modestly increase the risk of hip, wrist and spine fracture, predominantly in the older people or in presence of other recognised risk factors. Observational studies suggest that proton pump inhibitors may increase the overall risk of fracture by 10–40%. Some of this increase may be due to other risk factors. Patients at risk of osteoporosis should receive care according to current clinical guidelines and they should have an adequate intake of vitamin D and calcium.

Subacute cutaneous lupus erythematosus (SCLE)

Proton pump inhibitors are associated with very infrequent cases of SCLE. If lesions occur, especially in sun-exposed areas of the skin, and if accompanied by arthralgia, the patient should seek medical help promptly and the health care professional

should consider stopping Lansoprazole Krka . SCLE after previous treatment with a proton pump inhibitor may increase the risk of SCLE with other proton pump inhibitors.

Interference with laboratory tests

Increased Chromogranin A (CgA) level may interfere with investigations for neuroendocrine tumours. To avoid this interference, Lansoprazole Krka treatment should be stopped for at least 5 days before CgA measurements (see section 5.1). If CgA and gastrin levels have not returned to reference range after initial measurement, measurements should be repeated 14 days after cessation of proton pump inhibitor treatment.

As Lansoprazole Krka contains sucrose and sodium

Patients with rare hereditary problems of fructose intolerance, glucose-galactose malabsorption or sucrase-isomaltase insufficiency should not take this medicine.

This medicine 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 interactions

Effects of lansoprazole on other medicinal products

Medicinal products with pH dependent absorption

Lansoprazole may interfere with the absorption of other medicinal products where gastric pH is an important determinant of oral bioavailability

HIV Protease Inhibitors:

Co-administration of lansoprazole is not recommended with HIV protease inhibitors for which absorption is dependent on acidic intragastric pH, such as atazanavir, and nelfinavir, due to significant reduction in their bioavailability (see section 4.4).

Ketoconazole and itraconazole:

The absorption of ketoconazole and itraconazole from the gastrointestinal tract is enhanced by the presence of gastric acid. Administration of lansoprazole may result in sub-therapeutic concentrations of ketoconazole and itraconazole and the combination should be avoided.

Digoxin:

Co-administration of lansoprazole and digoxin may lead to increased digoxin plasma levels. The plasma levels of digoxin should therefore be monitored and the dose of digoxin adjusted if necessary when initiating and ending lansoprazole treatment.

Methotrexate:

Concomitant use with high-dose Methotrexate may elevate and prolong serum levels of methotrexate and/or its metabolite, possibly leading to methotrexate toxicities. Therefore, in settings where high-dose methotrexate is used a temporary withdrawal of lansoprazole may need to be considered.

Warfarin:

Co-administration of lansoprazole 60 mg and warfarin did not affect the pharmacokinetics of warfarin or INR. However, there have been reports of increased INR and prothrombin time in patients receiving PPIs and warfarin concomitantly. Increases in INR and prothrombin time may lead to abnormal bleeding and even death. Patients treated with lansoprazole and warfarin concomitantly may need to be monitored for increase in INR and prothrombin time, especially when initiating or ending concomitant treatment.

Medicinal products metabolised by P450 enzymes

Lansoprazole may increase plasma concentrations of medicinal products that are metabolised by CYP3A4. Caution is advised when combining lansoprazole with medicinal products which are metabolised by this enzyme and have a narrow therapeutic window.

Theophylline:

Lansoprazole reduces the plasma concentration of theophylline, which may decrease the expected clinical effect at the dose. Patient monitoring should be taken in coadministration of lansoprazole with theophylline.

Tacrolimus:

Co-administration of lansoprazole increases the plasma concentrations of tacrolimus (a CYP3A and Pgp substrate). Lansoprazole exposure increased the mean exposure of tacrolimus by up to 81%. Monitoring of tacrolimus plasma concentrations is advised when concomitant treatment with lansoprazole is initiated or ended.

Medicinal products transported by P-glycoprotein

Lansoprazole has been observed to inhibit the transport protein, P-glycoprotein (P-gp) *in vitro*. The clinical relevance of this is unknown.

Effects of other medicinal products on lansoprazole

Medicinal products which inhibit CYP2C19

Fluvoxamine:

A dose reduction may be considered when combining lansoprazole with the CYP2C19 inhibitor fluvoxamine. The plasma concentrations of lansoprazole increase up to 4-fold.

Medicinal products which induces CYP2C19 and CYP3A4

Enzyme inducers affecting CYP2C19 and CYP3A4 such as rifampicin, and St John’s wort (*Hypericum perforatum*) can markedly reduce the plasma concentrations of lansoprazole.

Others

Sucralfate/Antacids:

Sucralfate/Antacids may decrease the bioavailability of lansoprazole. Therefore lansoprazole should be taken at least 1 hour after taking these medicinal products.

No clinically significant interactions of lansoprazole with nonsteroidal anti-inflammatory medicinal products have been demonstrated, although no formal interactions studies have been performed.

4.6 Fertility, pregnancy and lactation

Pregnancy:

There is limited amount of data from the use of lansoprazole in pregnant women. Animal studies do not indicate direct or indirect harmful effects with respect to pregnancy, embryonal/foetal development, parturition or postnatal development.

As a precautionary measure, it is preferable to avoid, the use of lansoprazole during pregnancy.

Breastfeeding:

It is not known whether lansoprazole is excreted in human breast milk. Animal studies have shown that lansoprazole is excreted in milk.

A decision on whether to continue/discontinue breast-feeding or to continue/discontinue therapy with lansoprazole should be made taking into account the benefit of breast-feeding to the child and the benefit of lansoprazole therapy to the woman.

Fertility:

No human data on the effects of lansoprazole on fertility are available. In rats male and female fertility was not affected by lansoprazole.

4.7 Effects on ability to drive and use machines

Adverse drug reactions such as dizziness, vertigo, visual disturbances and somnolence may occur (*See section 4.8*). Under these conditions the ability to react may be decreased.

4.8 Undesirable effects

Frequencies are defined as common (> 1/100, < 1/10); uncommon (> 1/1,000, < 1/100); rare (> 1/10,000, < 1/1,000); very rare (<1/10,000); not known (cannot be estimated from the available data).

	Common	Uncommon	Rare	Very rare	Not known
Blood and		Thrombocytopenia,	Anaemia	Agranulocytosis,	

Lymphatic system disorders		eosinophilia, leucopenia		pancytopenia	
Immune system disorders				Anaphylactic shock	
Metabolism and nutrition disorders					Hypomagnesaemia (see section 4.4)
Psychiatric disorders		Depression	Insomnia, hallucination, confusion		Visual hallucinations
Nervous system disorders	Headache, dizziness		Restlessness, vertigo, paresthesia, somnolence, tremor		
Eye disorders			Visual disturbances.		
Gastrointestinal disorders	Nausea, diarrhoea, stomach ache, constipation, vomiting, flatulence, dry mouth or throat, fundic gland polyps (benign)		Glossitis, candidiasis of the oesophagus, pancreatitis, taste disturbances	Colitis, stomatitis	
Hepatobiliary disorders	Increase in liver enzyme levels		Hepatitis, jaundice		
Skin and subcutaneous tissue disorders	Urticaria, itching, rash		Petechiae, purpura, hair loss, erythema multiforme, photosensitivity	Steven-Johnson syndrome, toxic epidermal necrolysis	Subacute cutaneous lupus erythematosus (see section 4.4)
Musculoskeletal and connective tissue disorders		Arthralgia, myalgia, fracture of the hip, wrist or spine (see section 4.4)			
Renal and urinary disorders			Interstitial nephritis		
Reproductive system and breast disorders			Gynaecomastia		

General disorders and administration site conditions	Fatigue	Oedema	Fever, hyperhidrosis, angioedema, anorexia, impotence		
Investigations				Increase in cholesterol and triglyceride levels, hyponatremia	

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 HPRA Pharmacovigilance, Website: www.hpra.ie

4.9 Overdose

The effects of overdose of lansoprazole in humans are not known (although the acute toxicity is likely to be low) and, consequently, instruction for treatment cannot be given. However, daily doses of up to 180mg of lansoprazole orally and up to 90 mg of lansoprazole intravenously have been administered in trials without significant undesirable effects.

Please refer to section 4.8. for possible symptoms of lansoprazole overdose.

In case of suspected overdose the patient should be monitored. Lansoprazole is not significantly eliminated by haemodialysis. If necessary, gastric emptying, administration of charcoal and symptomatic therapy are recommended.

5 PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Proton pump inhibitors, ATC code: A02BC03.

Lansoprazole is a gastric proton pump inhibitor. It inhibits the final stage of gastric acid formation by inhibiting the activity of the H⁺/K⁺ATPase of the parietal cells in the stomach. The inhibition is dose-dependent and reversible, and the effect applies to both basal and stimulated secretion of gastric acid. Lansoprazole is concentrated in parietal cells and becomes active in their acidic environment, whereupon it reacts with sulphhydryl group of H⁺/K⁺ATPase causing inhibition of the enzyme activity.

Effect on gastric acid secretion:

Lansoprazole is a specific inhibitor of the parietal cell proton pump. A single oral dose of lansoprazole inhibits pentagastrin-stimulated gastric acid secretion by about 80%. After repeated daily administration for seven days, about 90% inhibition of gastric acid secretion is achieved. It has a corresponding effect on the basal secretion of gastric acid. A single oral dose of 30 mg reduces basal secretion by about 70%; consequently, the patients' symptoms are relieved starting from the very first dose. After eight days of repeated administration the reduction is about 85%. A rapid relief of symptoms is obtained by 30 mg daily, and most patients with duodenal ulcer recover within 2 weeks; patients with gastric ulcer and reflux oesophagitis within 4 weeks. By reducing gastric acidity, lansoprazole creates an environment in which appropriate antibiotics can be effective against *H. pylori*.

During treatment with antisecretory medicinal products, serum gastrin increases in response to the decreased acid secretion. Also CgA increases due to decreased gastric acidity. The increased CgA level may interfere with investigations for neuroendocrine tumours.

Available published evidence suggests that proton pump inhibitors should be discontinued between 5 days and 2 weeks prior to CgA measurements. This is to allow CgA levels that might be spuriously elevated following PPI treatment to return to reference range.

5.2 Pharmacokinetic properties

Lansoprazole is a racemate of two active enantiomers that are biotransformed into the active form in the acidic environment of the parietal cells. As lansoprazole is rapidly inactivated by gastric acid, it is administered orally in enteric-coated form(s) for systemic absorption.

Absorption and distribution:

Lansoprazole exhibits high (80-90%) bioavailability with a single dose. Peak plasma levels occur within 1.5 to 2.0 hours. Intake of food slows the absorption rate of lansoprazole and reduces the bioavailability by about 50%. The plasma protein binding is 97%.

Biotransformation and elimination:

Lansoprazole is extensively metabolised by the liver and the metabolites are excreted by both the renal and biliary route. The metabolism of lansoprazole is mainly catalysed by the enzyme CYP2C19. The enzyme CYP3A4 also contributes to the metabolism. The plasma elimination half-life ranges from 1 to 2 hours following single or multiple doses in healthy subjects. There is no evidence of accumulation following multiple doses in healthy subjects. Sulphone, sulphide and 5-hydroxyl derivatives of lansoprazole have been identified in plasma. These metabolites have very little or no antisecretory activity.

A study with ¹⁴C labelled lansoprazole indicated that approximately one-third of the administered radiation was excreted in the urine and two-thirds was recovered in the faeces.

Special patient populations

Elderly

The clearance of lansoprazole is decreased in older people, with elimination half-life increased approximately 50% to 100%. Peak plasma levels were not increased in older people.

Paediatric population

The evaluation of the pharmacokinetics in children aged 1 –17 years of age showed a similar exposure as compared to adults with doses of 15 mg for those below 30 kg of weight and 30 mg for those above. The investigation of a dose of 17 mg/m² body surface or 1 mg/kg body weight also resulted in comparable exposure of lansoprazole in children aged 2-3 months up to one year of age compared to adults.

Higher exposure to lansoprazole in comparison to adults has been seen in infants below the age of 2-3 months with doses of both 1.0 mg/kg and 0.5 mg/kg body weight given as a single dose.

Hepatic insufficiency

The exposure of lansoprazole is doubled in patients with mild hepatic impairment and much more increased in patients with moderate and severe hepatic impairment.

CYP2C19 poor metabolisers

CYP2C19 is subject to genetic polymorphism and 2-6 % of the population, called poor metabolisers (PMs), are homozygous for a mutant CYP2C19 allele and therefore lacks a functional CYP2C19 enzyme. The exposure of lansoprazole is several-fold higher in PMs than in extensive metabolisers (EMs).

5.3 Preclinical safety data

Non-clinical data reveal no special hazard for humans based on conventional studies of safety pharmacology, repeated dose toxicity, toxicity to reproduction or genotoxicity.

In two rat carcinogenicity studies, lansoprazole produced dose-related gastric ECL cell hyperplasia and ECL cell carcinoids associated with hypergastrinaemia due to inhibition of acid secretion. Intestinal metaplasia was also observed, as were Leydig cell hyperplasia and benign Leydig cell tumours. After 18 months of treatment retinal atrophy was observed. This was not seen in monkeys, dogs or mice.

In mouse carcinogenicity studies dose-related gastric ECL cell hyperplasia developed as well as liver tumours and adenoma of rete testis.

The clinical relevance of these findings is unknown.

6 PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Sugar spheres (sucrose and maize starch)
Povidone
Disodium hydrogen phosphate dihydrate
Sodium laurilsulfate
Methacrylic acid-ethylacrylate copolymer (1:1) -dispersion 30 %
Talc
Macrogol
Titanium dioxide (E171)
Polysorbate 80

Capsule shell:

Body: Gelatine
Titanium dioxide (E171)
Cap: Gelatine
Titanium dioxide (E171)

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

3 years.

The shelf life after first opening the container is 4 months.

6.4 Special precautions for storage

Do not store above 25°C.
Store in the original package.
Keep the container (bottle) tightly closed, in order to protect from moisture.

6.5 Nature and contents of container

Polyethylene (HDPE) plastic container with a polypropylene cap. The container contains a 2 g silica gel desiccant capsule. The 98 capsule container contains two (2x2 g) silica gel desiccant capsules.

Pack sizes: 14, 28, 56 and 98 capsules.

Not all pack sizes will be marketed.

Blister (laminated OPA/Alu/PVC foil – aluminium foil)
Pack sizes of 7, 14, 28, 49, 56 and 98 capsules.

Not all pack sizes will be marketed.

6.6 Special precautions for disposal and other handling

No special requirements.

7 MARKETING AUTHORISATION HOLDER

KRKA, d.d., Novo mesto
Šmarješka cesta 6
8501 Novo mesto
Slovenia

8 MARKETING AUTHORISATION NUMBER

PA1347/062/002

9 DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 23 September 2005

Date of last renewal: 21 January 2010

10 DATE OF REVISION OF THE TEXT

March 2022