Lucetam®

International Non-Proprietary Name (INN): Piracetam

Dosage Form: pills

Structure: 1 pill contains:
Active ingredient: piracetam 800mg or 1200mg;
Excipients: magnesium stearate, povidone K-30, macrogol 6000, dibutyl sebacate, titanium dioxide (E171), talc, ethylcellulose, hypromellose.

Description: oblong, concave pills without any smell with white or almost white coating and a facet; "E 243" is engraved on one side of the tablet

Pharmacological classification: nootropic

ATC code: N06BX03

Pharmacological action: nootropic, antihypoxic, cerebroprotective

Pharmacodynamics:
Piracetam is a cyclic derivative of GABA. Has a direct effect on the brain. Improves cognitive processes, such as learning ability, memory, attention and mental performance without having a sedative or psychostimulating effect.
Lucetam has an effect on the central nervous system in various ways: it changes the speed of brain excitation spreading, improves neuronal plasticity and metabolic processes in nerve cells.
It improves communication between the cerebral hemispheres and synaptic conduction in neocortical structures, improves mental performance and cerebral blood flow.
Lucetam improves microcirculation in the brain by influencing the blood rheology without having a vasorelaxant action.
Lucetam inhibits platelet aggregation, restores the elasticity of the erythrocyte membrane, and erythrocyte capability to transit through the microvasculature. It reduces red cell adherence.
At a dose of 9.6 g it decreases the fibrinogen level and the von Willebrand factors by 30-40% and increases the bleeding time.
Lucetam provides protective and restorative action in case of impaired brain function caused by hypoxia, intoxication or trauma. It reduces the severity and duration of the vestibular nystagmus.

Pharmacokinetics:
Absorption: After ingestion, Piracetam is quickly and almost completely absorbed from the gastro-intestinal tract. The bioavailability of Piracetam is close to 100%. 30 minutes after an intake of a single dose of 2g the maximum concentration in blood plasma reaches 40-60 mcg/ml. Piracetam reaches its maximum concentration in the cerebrospinal fluid 2-8 hours after the intake.
Distribution: Does not bind with blood plasma proteins. Distribution volume is about 0.6 l/kg. Piracetam accumulates selectively in tissues of the cerebral cortex, mainly in the frontal, parietal and occipital lobes, in the cerebellum and in basal nuclei. Piracetam penetrates through the blood-brain barrier and placental barrier.
Metabolism: Does not metabolize in the body.
Excretion: The half-life is 4-5 hours from the blood plasma and 8.5 hours from the cerebrospinal fluid. Piracetam is excreted in the unchanged form by the kidneys. Almost complete excretion by the kidneys (>95%) occurs within 30 hours. The total clearance of Piracetam in healthy volunteers is 86 ml/min. The half-life is prolonged in case of kidney failure.

Intended uses:

- symptomatic treatment of the psycho-organic syndrome (including elderly patients with memory loss, dizziness, reduced ability to concentrate, mood changes, behavioral disorder, gait disorder, as well as patients with Alzheimer's disease and senile Alzheimer-type dementia);
- treatment of consequences of an ischemic stroke, such as speech disorders, emotional, motor and mental disorders;
- treatment of withdrawal syndrome and psycho-organic syndrome in case of chronic alcohol addiction;
- during recovery therapy after trauma and intoxication of the brain;
- treatment of dizziness and related equilibrium disorders (excluding cases of dizziness of vasomotor and psychogenic origin);
- (as a part of complex therapy) treatment of low learning ability in children;
- treatment of cortical myoclonia (both in the form of monotherapy, and as part of combination therapy).

Contraindications:

- hypersensitivity to the drug ingredients;
- haemorrhagic stroke;
- Huntington's chorea;
- terminal stage of kidney failure (CC<20 ml/min);
- children under 1 year old;
- pregnancy and lactation.

With caution: hemostasis disorder, extensive surgical interventions, severe bleeding.

Dosage and administration:

For oral administration (during meals or on an empty stomach with liquid).

Daily doses vary within the range of 30-160 mg/kg of the body weight. Dosage frequency is 2-4 times/day.

Memory and intellectual disorders: 2.4-4.8 g / day, divided into 2-3 administrations.

In case of the chronic psycho-organic syndrome the drug is prescribed at a dose of 4.8 g/day during the first week, and then the patient is transferred to the maintenance dose of 1.2-2.4 g/day.

When treating consequences of an ischemic stroke Lucetam is prescribed at a dose of 4.8 g/day.

When treating coma and difficulties in perception in people with brain injury, the initial dose is 9-12 g/day, the maintenance dose is 2.4 g/day. The treatment should continue for at least 3 weeks.

When treating abstinence in case of chronic alcohol addiction the dose of the drug reaches 12 g/day. The maintenance dose is 2.4 g/day.

When treating dizziness and related equilibrium disorders the dose is 2.4-4.8 g/day.

In case of cortical myoclonia, the treatment starts with a dose of 7.2 g/day, every 3-4 days the dose is increased by 4.8 g/day until the maximum dose of 24 g/day is reached. The treatment continues throughout the whole period of the disease. Every 6 months attempts should be made to reduce the dose or discontinue the drug gradually reducing the dose by 1.2 g/day every 2 days. In case of lack of efficacy or a slight therapeutic effect, the treatment is discontinued.

Treatment of dyslexia in children (low learning ability): the recommended daily dosage for children from 8 years and adolescents - 3.2 g, divided into 2 administrations.

Special Groups of Patients

Dose adjustment is not required for patients with the compromised liver function.

In patients with kidney disorders the dose should be adjusted depending on the amount of creatinine clearance (see the table below).

The creatinine clearance for men can be calculated based on the serum creatinine concentration, according to the following formula:
Creatinine clearance, ml/min = [(140 - age, years) × body weight, kg] / (72 × serum creatinine concentration, mg/dL)
The creatinine clearance for women can be calculated by multiplying the obtained value by a factor of 0.85.

Kidney failure	Creatinine clearance, ml/min	Dose regimen
Missing (norm)	> 80	Usual Dose
Light	50-79	2/3 of the usual dose in 2-3 intakes
Average	30-49	1/3 of the usual dose in 2 intakes
Severe	<30	1/6 of the usual dose in a single intake
End-stage	—	Contraindicated

The dose for elderly patients is adjusted in case of kidney failure. The monitoring of the functional state of the kidneys is necessary in case of the long-term therapy.

Side effects (rare):
Central nervous system disorders: hyperkinesia, nervousness, drowsiness, depression, asthenia. These side effects often occur in elderly patients who received the drug at a dose of more than 2.4 g/day. In most cases, the reduction of the dose can lower these side effects. In some cases dizziness, headache, ataxia, balance disorder, and acute condition of epilepsy, insomnia, tremor, confusion, agitation, anxiety, panic, hallucinations, and increased libido are reported.
Metabolism disorders: increase in the body weight.
Digestive system disorders: nausea, vomiting, diarrhea, abdominal and epigastric pains.
Dermatological reactions: dermatitis, itching, urticaria.
Blood and lymphatic system: bleeding.
Immune system disorders: anaphylactoid reactions, hypersensitivity.
Hearing disorders: vertigo.
Allergic reactions: angioneurotic edema.
Cardiovascular system disorders: hypertension; hypotension.
Other: pain in the area of injection, thrombophlebitis, hyperthermia.

Overdose:
Piracetam is a low toxic drug. In case of severe overdose, immediately pump the stomach or induce vomiting. Symptomatic therapy, which may include hemodialysis, is recommended. No specific antidote exists. The efficiency of hemodialysis is 50-60%.

Interaction with other drugs:
Acute irritation, disorientation and sleep disturbance are reported when the drug is used simultaneously with thyroid extract.
No interaction of Lucetam with Clonazepam, Phenytoin, Phenobarbital, sodium valproate was reported.
Piracetam in high doses (9.6 g/day) increased the effectiveness of Acenocoumarol in patients with venous thrombosis: reports showed greater reduction in the level of aggregation of platelets, in fibrinogen level, in von Willebrand factors, and in blood and plasma viscosity, compared with the case when Acenocoumarol only was prescribed.
The possibility of changing the pharmacodynamics of Piracetam under the influence of other drugs is low, because 90% of its dose is excreted in the urine in the unchanged form.
In vitro piracetam at concentrations of 142, 426 and 1422 μg/ml does not inhibit the activity of the isoenzymes CYP1A2, 2B6, 2C8, 2C9, 2C19, 2D6, 2E1 and 4A9/11. At a concentration of 1422 μg/ml, slight inhibition of the activity of the isoenzymes CYP2A6 (21%) and 3A4/5 (11%) is reported. However, the level of the inhibition constant (Ki) of these two isoenzymes is sufficient in case there is an exceeding of 1422 μg/ml. Therefore,

metabolic interaction with other drugs is unlikely. When piracetam is taken at a dose of 20 mg/day, there is no changing of the maximum concentrations in the blood plasma and of the nature of the pharmacokinetic curve of antispasmatic medications (Carbamazepine, Phenytoin, Phenobarbital, Valproate) in patients with epilepsy receiving constant doses of the drug. When Piracetam was taken at a dose of 1.6 g with ethanol, the concentrations of Piracetam and ethanol in the serum remained unchanged.

Pregnancy and lactation:
Adequate and strictly controlled studies of the safety of the use of Lucetam during pregnancy have not been conducted. Therefore the drug should not be prescribed during pregnancy, except cases of emergency. Piracetam penetrates through the placental barrier, and is excreted in breast milk. The concentration of Piracetam in newborns reaches 70-90% of its concentration in the blood of the mother. If taking of the drug is required during lactation, breastfeeding should be discontinued.

Influence on the ability to drive vehicles and operate mechanisms:
Taking into account possible undesirable effects, the patient should be careful when operating mechanisms and driving vehicles.

Special precaution
Lucetam should be taken no later than 5 pm to prevent sleep disturbances.
Because Piracetam has an influence on the aggregation of platelets, it should be prescribed with caution to patients with hemostasis disorders, during major surgical interference, and to patients with severe bleeding symptoms.
When treating patients with cortical myoclonia, abrupt discontinuation of the therapy should be avoided. This can cause episode relapse.

In case of a long-term therapy of elderly patients, regular monitoring of kidney function indicators is recommended; if necessary, the dose is adjusted depending on the results of the creatinine clearance study.
Lucetam penetrates through the filtration membranes of hemodialysis apparatus.

Terms of release from pharmacy: on prescription

Storage conditions: store at temperatures of 15-30°C. Keep out of reach of children.

Shelf life: 5 years. Do not use beyond the expiration date.

Country of manufacture: Hungary