Package leaflet: Information for the patient

Mykronor 5 micrograms/ml solution for injection/infusion
noradrenaline (norepinephrine)

Read all of this leaflet carefully before you are given this medicine because it contains important information for you.
- Keep this leaflet. You may need to read it again.
- If you have any further questions, ask your doctor, pharmacist or nurse.
- If you get any side effects, talk to your doctor or nurse. This includes any possible side effects not listed in this leaflet. See section 4.

What is in this leaflet

1. What Mykronor is and what it is used for

This medicine contains the active substance noradrenaline (as noradrenaline tartrate) and acts as a vasoconstrictor (narrowing of the blood vessels).

This medicine is for adults only.
This medicine is used during surgery to restore and maintain blood pressure, following a drop induced by anaesthesia.

2. What you need to know before you are given Mykronor

You must not be given Mykronor:
- if you are allergic to noradrenaline or any of the other ingredients of this medicine (listed in section 6),
- during anaesthesia with cyclopropane or halothane.

Warnings and precautions
Talk to your doctor, pharmacist or nurse before you are given Mykronor:
- if you have an ischemic heart disease (disease caused by narrowing or blockage of blood vessels supplying the heart muscle),
- if you have angina (chest pain),
- if you have recently had myocardial infarction (a heart attack),
- if you have clots or obstructions in the blood vessels supplying the heart, intestines or other parts of the body (vascular condition),
- if you are hypertensive (have high blood pressure),
- if you are hypotensive (have low blood pressure) that has been caused by hypovolaemia (low blood volume),
- if you have hyperthyroidism (your thyroid gland is overactive),
- if you have an intracranial hypertension (high pressure in the brain),
- if you have diabetes (disease characterized by a high blood sugar level over a prolonged period of time),
- if you are older,
- if you have liver or severe kidney problems.

During the infusion of noradrenaline, your doctor will check continuously your blood pressure, cardiac frequency (heart rate) and the infusion site.

In cases where it is necessary to administer noradrenaline at the same time as blood or plasma transfusion, the latter will be administered in a separate drip.

Children and adolescents
Mykronor is indicated for adults only. This medicine is not recommended in children and adolescents less than 18 years of age.

Other medicines and Mykronor
Tell your doctor or pharmacist if you are taking, have recently taken or might take any other medicines. Mykronor may affect or be affected by other medicines.

A number of medicines are known to increase the toxic effects of noradrenaline:
- Certain anaesthetics such as halothane, cyclopropane (anaesthetic gases) and propofol (injected anaesthetic),
- Antidepressants, so-called serotoninergic-adrenergic antidepressants (such as fluoxetine, sertraline), or selective MAO inhibitors (such as moclobemide), or imipramine antidepressants (such as imipramine, trimipramine), or non-selective MAO inhibitors (such as amitriptiline, iproniazide, phenelzine),
- Linezolid (an antibiotic) (medicine used to treat infections caused by bacteria and other microorganisms),
- Methylene blue (an antidote),
- Blood pressure lowering medicines (such as guanethidine, reserpine, beta-blockers (for example propranolol)),
- Thyroid hormones, cardiac glycosides (a class of medicines that increase the output force of the heart and increase its rate of contractions), and anti-arrhythmics (medicine used to suppress abnormal rhythms of the heart) (such as digitalis),
- Ergot alkaloids (such as bromocriptine),
- Medicines inducing contractions (such as oxytocin).

Pregnancy and breast-feeding
If you are pregnant or breast-feeding, think you may be pregnant or are planning to have a baby, ask your doctor, pharmacist or nurse for advice before you are given this medicine.

Pregnancy
A limited amount of data is available from the use of noradrenaline in pregnant women. Noradrenaline can pass through the placenta, cause strong uterine contractions and reduce the blood flow of the placenta, causing the foetus to get too little oxygen. For this reason, the use of noradrenaline during pregnancy is not recommended unless advantages for the mother exceed the potential risks for the foetus. If you are pregnant, your doctor will decide if you should be given this medicine, as noradrenaline may harm the unborn baby.

Breast-feeding
It is not known whether noradrenaline passes into breast milk. Because Noradrenaline is not absorbed by oral route, this medicine can be used with caution during breast-feeding

Mykronor contains sodium
This medicine contains 71 mg sodium (main component of cooking/table salt) in each vial of 20 ml. This is equivalent to 3.6 % of the recommended maximum daily intake of sodium for an adult.
This medicine contains 177 mg sodium (main component of cooking/table salt) in each vial of 50 ml. This is equivalent to 8.9 % of the recommended maximum daily intake of sodium for an adult.

3. How Mykronor is given

This medicine will be given to you in a hospital, by a doctor or nurse.

This medicine will be administered by intravenous infusion (into a vein). An initial bolus of the medicine may be injected in the vein before the start of the infusion.
During your treatment, your blood pressure is accurately checked, the infusion rate of the infusion is under continuous supervision, and you are constantly monitored.

The recommended dose of Mykronor will depend on your medical condition. Your doctor will determine the correct dose for you.

If you have been given more Mykronor than you should

Since this medicine is administered to you during surgery by a trained healthcare professional, it is unlikely that you will be given too much of Mykronor. However, if you think that you have received too much of the medicine, contact a doctor or nurse immediately.

In the event of overdose, the following symptoms may be observed: headache, hypertension (severe high blood pressure), slow heartbeat, cutaneous vasoconstriction (blood vessels become narrower), circulatory collapse (failure of the circulation), cerebral haemorrhage (brain bleed), light sensitivity, pain in the chest, pale colour, fever, intense sweating, pulmonary oedema (excess fluid in the lungs) and vomiting.

If you have any further questions on the use of this medicine, ask your doctor or nurse.

4. Possible side effects

Like all medicines, this medicine can cause side effects, although not everybody gets them.

The following side effects have been reported:
- Anxiety,
- Insomnia (sleeplessness),
- Headache,
- Tremor (involuntary muscle contraction),
- Dizziness,
- Acute glaucoma (condition caused by a rapid or sudden increase in pressure inside the eye),
- Tachycardia (fast heart rate), bradycardia (slow heart rate), arrhythmia (irregular heart beats), electrocardiogram (a test of the heart's activity) change, cardiogenic shock (a steep fall in blood pressure in the heart area), stress cardiomyopathy (damage to the heart muscle),
- Arterial hypertension (high blood pressure) and tissue hypoxia (decrease in oxygen supply to some organ), coldness and paleness of the members and the face, painful and cold extremities (gangrene), plasma volume depletion (reduced amounts of plasma (the liquid part of the blood) in the body),
- Dyspnea (difficulty to breath),
- Nausea and vomiting,
- Retention of urine,
- Locally: possibility of irritation and necrosis (cell injury, causing death of cells in the tissue) at the injection site.

In case of hypersensitivity (allergy) or overdose, the following effects may appear more frequently with arterial hypertension (high blood pressure): violent headache, photophobia (abnormal intolerance to visual perception of light), retrosternal pain (thoracic pain), pallor (pale skin), fever, intense sweating, vomiting (being sick), pulmonary oedema (difficulty to breath), arrhythmia (irregular heart beats) or cardiac arrest.

Reporting of side effects
If you get any side effects, talk to your doctor, pharmacist or nurse. This includes any possible side effects not listed in this leaflet. You can also report side effects directly via :
HPRA Pharmacovigilance
Website: www.hpra.ie.

By reporting side effects you can help provide more information on the safety of this medicine.

5. How to store Mykronor

Keep this medicine out of the sight and reach of children.
Store below 25°C. Keep the vial in the outer carton in order to protect from light. Do not freeze.
Do not use this medicine after the expiry date which is stated on the label of the vial after EXP. The expiry date refers to the last day of that month. Your doctor or nurse will check this.

For single use only.
Chemical and physical in-use stability has been demonstrated for 24 hours at 30°C in a polypropylene syringe. From a microbiological point of view, the product should be used immediately. If not used immediately, in-use storage times and conditions prior to use are the responsibility of the user and would normally not be longer than 24 hours at 2 to 8°C, unless manipulation has taken place in controlled and validated aseptic conditions.

This medicinal product is a clear and colourless solution, practically free from visible particles. The solution should not be used if the solution appears slightly yellow or pink, or is brown in colour, or if it contains particles or a precipitate.

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

6. Contents of the pack and other information

What Mykronor contains
- The active substance is noradrenaline (norepinephrine) (as noradrenaline (norepinephrine) tartrate).
  Each ml of solution contains 5 micrograms noradrenaline (norepinephrine) equivalent to 10 micrograms noradrenaline (norepinephrine) tartrate.
  Each 20 ml vial contains 100 micrograms noradrenaline (norepinephrine), equivalent to 200 micrograms noradrenaline (norepinephrine) tartrate.
  Each 50 ml vial contains 250 micrograms noradrenaline (norepinephrine), equivalent to 500 micrograms noradrenaline (norepinephrine) tartrate.
- The other ingredients are: sodium chloride, disodium edetate, hydrochloric acid (for pH adjustment) and water for injections.

What Mykronor looks like and contents of the pack
This medicine is a clear colourless solution for intravenous injection and infusion, practically free from visible particles, packaged in a clear glass vial of 20 ml or 50 ml, closed with a chlorobutyl rubber stopper and an aluminium cap.
Mykronor is available in box of 1 and 10 vials.

Not all pack sizes may be marketed.

Marketing Authorisation Holder and Manufacturer
Laboratoire AGUETTANT
1, rue Alexander Fleming
69007 Lyon
France

This leaflet was last revised in 11/2021.

Other sources of information

Detailed information on this medicine is available on the HPRA website.

The following information is intended for healthcare professionals only:

Qualitative and quantitative composition:
Each ml of solution for injection/infusion contains 10 micrograms of noradrenaline (norepinephrine) tartrate monohydrate, equivalent to 5 micrograms noradrenaline (norepinephrine) anhydrous.
Each 20 ml vial contains 200 micrograms of noradrenaline (norepinephrine) tartrate monohydrate, equivalent to 100 micrograms of noradrenaline (norepinephrine) anhydrous.
Each 50 ml vial contains 500 micrograms of noradrenaline (norepinephrine) tartrate monohydrate, equivalent to 250 micrograms of noradrenaline (norepinephrine) anhydrous.

Therapeutic indications:
Restoration and maintenance of peri-operative blood pressure following hypotension induced by spinal or general anaesthesia in adults.

Posology:

This presentation is suitable for perioperative setting, the concentration is not adapted to critical care setting.

The infusion can be administered through a peripheral venous line as a bolus injection or a continuous infusion using either a syringe pump, an infusion pump, or a drip counter.

This medicinal product should not be diluted before use: it is supplied ready to use and must not be mixed with other medicines.
The patient should be monitored carefully, and never be left unattended while receiving noradrenaline.

Care should be taken to avoid extravasation. To prevent sloughing and necrosis in areas in which extravasation has taken place, the area should be infiltrated as soon as possible with 10 ml to 15 ml of saline solution containing from 5 mg to 10 mg of phentolamine. Noradrenaline infusion should be stopped.

Initial rate
The initial dose of infusion is between 0.02 µg/kg/min and 0.05 µg/kg/min of noradrenaline (equivalent to 0.04 µg/kg/min and 0.1 µg/kg/min of noradrenaline tartrate). An initial intravenous bolus of 5 µg to 10 µg of noradrenaline (10 µg to 20 µg noradrenaline tartrate) may be administered before the start of the infusion, following spinal anesthesia, or the induction of general anesthesia.

Titration of dose
Once an infusion of noradrenaline has been established the dose can be increased or decreased to maintain an adequate target blood pressure during the peri-operative period. The dose should be adjusted according to age, weight and clinical condition of the patient.
Intravenous bolus of 5 µg to 10 µg noradrenaline (10 µg to 20 µg noradrenaline tartrate) can be administered if the blood pressure needs to be increased rapidly.

Duration of treatment and monitoring
Noradrenaline should be continued throughout the peri-operative period as long as considered necessary to maintain adequate blood pressure and tissue perfusion.

Withdrawal of therapy
Infusions should be reduced gradually, avoiding abrupt withdrawal which can result in acute hypotension.

Elderly patients
In general, dose selection for an elderly patient should be cautious, starting at the low end of the dosing range as to reflect the greater frequency of decreased hepatic, renal or cardiac function and concomitant disease or other drug therapy.

For the full information on the indication and use, refer to the Summary of the Product Characteristics.