

Terlipressin Injection

1mg/5ml, 1mg/10ml

1. Name of the medicinal product

Terlipressin acetate injection 1mg/5ml Taj Pharma

Terlipressin acetate injection 1mg/10ml Taj Pharma

2. Qualitative and quantitative composition

a) Terlipressin acetate injection 1mg/5ml

Each ml contains:

Terlipressin acetate	0.2mg
Water for injection	q.s

b) Terlipressin acetate injection 1mg/10ml

Each ml contains:

Terlipressin acetate	0.1mg
Water for injection	q.s

For the full list of excipients, see section 6.1.

3. Pharmaceutical form

Solution for injection.

Clear colourless solution, with pH between 3.7 and 4.2, and osmolality between 290 and 360 mOsm/kg.

4. Clinical particulars

4.1 Therapeutic indications

Terlipressin is indicated in the treatment of bleeding oesophageal varices.

4.2 Posology and method of administration

The administration of terlipressin serves the emergency care for acute bleeding oesophageal varices until endoscopic therapy is available. Afterwards the

administration of terlipressin for the treatment of oesophageal varices is usually an adjuvant therapy to the endoscopic haemostasis.

Adults

The recommended initial dose is 1 to 2 mg terlipressin acetate[#] (equivalent to 8.5 to 17 ml of solution), administered by intravenous injection over a period of time.

Depending on the patient's body weight the dose can be adjusted as follows:

- weight less than 50 kg: 1 mg terlipressin acetate (8.5 ml)

- weight 50 kg to 70 kg: 1.5 mg terlipressin acetate (12.75 ml)

- weight exceeding 70 kg: 2 mg terlipressin acetate (17 ml).

After the initial injection, the dose can be reduced to 1 mg terlipressin acetate every 4 to 6 hours.

The approximate value for the maximum daily dose of Terlipressin acetate SUN 0.12 mg/ml solution for injection is 120 µg terlipressin acetate per kg body weight.

The therapy is to be limited to 2 – 3 days in adaptation to the course of the disease.

[#] 1 to 2 mg terlipressin acetate corresponding to 0.85 to 1.7 mg terlipressin.

Elderly

Terlipressin should only be used with caution in patients over 70 years (see section 4.4).

Paediatric population

Terlipressin is not recommended in children and adolescents due to insufficient

experience on safety and efficacy (see section 4.4).

Renal insufficiency

Terlipressin should only be used with caution in patients with chronic renal failure (see section 4.4).

Hepatic insufficiency

A dose adjustment is not required in patients with liver failure.

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

Terlipressin should only be used with caution and under strict monitoring of the patients in the following cases:

- septic shock
- bronchial asthma, respiratory deficiencies
- uncontrolled hypertension
- cerebral or peripheral vascular diseases
- cardiac arrhythmias
- acute coronary syndrome, coronary deficiencies or previous myocardial infarction
- chronic renal insufficiency
- elderly patients > 70 years as experience is limited in this group
- pregnancy (see section 4.6).

Also hypovolaemic patients often react with an increased vasoconstriction and atypical cardiac reactions.

Due to the weak antidiuretic effect of terlipressin (only 3% of the antidiuretic

effect of native vasopressin) especially patients with already disturbed electrolyte metabolism should be monitored for a possible hyponatraemia and hypokalaemia.

In principle the use of the product should be confined to specialist supervision in units with facilities for regular monitoring of the cardiovascular system, haematology and electrolytes.

In emergency situations which require an immediate treatment before sending the patient to a hospital symptoms of hypovolaemia have to be considered.

Terlipressin has no effect on arterial bleeding.

To avoid local necrosis at the injection site, the injection must be administered intravenously.

Skin Necrosis

During post-marketing experience several cases of cutaneous ischemia and necrosis unrelated to the injection site (see section 4.8) have been reported. Patients with peripheral venous hypertension or morbid obesity seem to have a greater tendency to this reaction. Therefore, extreme caution should be exercised when administering terlipressin in these patients.

Torsade de pointes

During clinical trials and post-marketing experience, several cases of QT interval prolongation and ventricular arrhythmias including "Torsade de pointes" have been reported (see section 4.8). In most cases, patients had predisposing factors such as basal prolongation of the QT interval, electrolyte abnormalities (hypokalemia, hypomagnesemia) or medications with concomitant effect on QT prolongation. Therefore, extreme caution should be

exercised in the use of terlipressin in patients with a history of QT interval prolongation, electrolytic abnormalities, concomitant medications that can prolong the QT interval, such as class IA and III antiarrhythmics, erythromycin, certain antihistamines and tricyclic antidepressants or medications that can cause hypokalaemia or hypomagnesemia (e.g. some diuretics) (see section 4.5).

Particular caution should be exercised in the treatment of children, adolescents and elderly patients, as experience is limited and there is no data available regarding dosage recommendation in these special patient categories.

This medicinal product contains 15.7 mmol (or 361 mg) of sodium in its single maximum dose. To be taken into consideration by patients on a controlled sodium diet.

4.5 Interaction with other medicinal products and other forms of interaction

Terlipressin increases the hypotensive effect of non-selective β -blockers on the portal vein. The reduction in heart rate and cardiac output caused by the treatment can be attributed to the inhibition of the reflexogenic activity of the heart through the vagus nerve as a result of increased blood pressure. Concomitant treatment with drugs known to induce bradycardia (e.g. propofol, sufentanil) can cause severe bradycardia.

Terlipressin can trigger ventricular arrhythmias including "Torsade de pointes" (see sections 4.4 and 4.8). Therefore, extreme caution should be exercised in the use of terlipressin in patients with concomitant medications that can prolong the QT interval, such as class IA and III antiarrhythmics, erythromycin, certain antihistamines and tricyclic antidepressants

or medications that may cause hypokalaemia or hypomagnesemia (e.g. some diuretics).

4.6 Fertility, pregnancy and lactation

Pregnancy

The use of terlipressin is not recommended during pregnancy as it has been shown to cause uterine contractions and increased intrauterine pressure in early pregnancy and may decrease uterine blood flow. Terlipressin may have harmful effects on pregnancy and foetus. Spontaneous abortion and malformation has been shown in rabbits after treatment with terlipressin (see section 5.3).

Terlipressin should therefore only be used at vital indication on a case by case decision especially in the first trimester, when bleeding cannot be controlled with endoscopic therapy.

Breastfeeding

It is not known whether terlipressin is excreted in human breast milk. The excretion of terlipressin in milk has not been studied in animals. A risk to the suckling child cannot be excluded. A decision on whether to continue/discontinue breastfeeding or to continue/discontinue therapy with terlipressin should be made taking into account the benefit of breast-feeding to the child and the benefit of terlipressin therapy to the woman.

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.

4.8 Undesirable effects

The assessment of undesirable effects is based on the following frequencies:

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).

Treatment of bleeding oesophageal varices with terlipressin (1 mg intravenously and more) may be accompanied by the following adverse reactions:

Metabolism and nutrition disorders

Uncommon: hyponatraemia if fluid not monitored

Very rare: hyperglycaemia

Nervous system disorders

Common: headache

Uncommon: triggering of a convulsive disorder

Very rare: stroke

Cardiac disorders

Common: ventricular and supra-ventricular arrhythmia, bradycardia, signs of ischaemia in the ECG

Uncommon: angina pectoris, acute hypertension rise, in particular in patients already suffering from hypertension (generally, it decreases spontaneously), atrial fibrillation, ventricular extrasystoles, tachycardia, chest pain, myocardial infarction, fluid overload with pulmonary oedema, cardiac failure, Torsade de Pointes

Very rare: myocardial ischemia

Vascular disorders

Common: hypertension, hypotension,

peripheral ischaemia, peripheral vasoconstriction, facial pallor

Uncommon: intestinal ischaemia, peripheral cyanosis, hot flushes

Respiratory, thoracic and mediastinal disorders

Uncommon: pain in the chest, bronchospasm, respiratory distress, respiratory failure

Rare: dyspnoea

Gastrointestinal disorders

Common: transient abdominal cramps, transient diarrhoea

Uncommon: transient nausea, transient vomiting

Skin and subcutaneous tissue disorders

Common: paleness

Uncommon: lymphangitis, skin necrosis unrelated to the site of administration

Reproductive system and breast disorders

Common: abdominal cramps (in women)

Pregnancy, puerperium and perinatal conditions

Uncommon: uterine hypertonus, uterine ischemia

Not known: uterine constriction, decreased uterine blood flow

General disorders and administration site conditions

Uncommon: local cutaneous necrosis.

During clinical trials and post-marketing experience, several cases of QT interval prolongation and ventricular arrhythmias including "Torsade de pointes" have been reported (see sections 4.4 and 4.5).

During post-marketing experience, several cases of cutaneous ischemia and necrosis

unrelated to the injection site have been reported (see section 4.4).

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important.

4.9 Overdose

The recommended dose should not be exceeded in any case, since the risk of severe circulatory adverse effects is dose-dependent.

An acute hypertensive crisis, especially in patients with recognized hypertension can be controlled with a vasodilator-type alpha-blocker, e.g. 150 microgram clonidine intravenously.

Bradycardia requiring treatment should be treated with atropine.

5. Pharmacological properties

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Systemic hormonal preparations, posterior pituitary lobe hormones, vasopressin and analogues.

Terlipressin inhibits portal hypertension with simultaneous reduction of blood circulation in portal vessels. Terlipressin contracts smooth oesophageal muscle with consecutive compression of oesophageal varices.

The inactive pre-hormone terlipressin slowly releases bioactive lysinevasopressin. Metabolic elimination takes place concomitantly and within a period of 4-6 hours. Therefore, concentrations remain continuously above the minimal effective dose and below toxic concentrations.

Specific effects of terlipressin are assessed as follows:

Gastrointestinal system

Terlipressin increases the tone of vascular and extravascular smooth muscle cells. The increase in arterial vascular resistance leads to decrease of splanchnic hypervolemia. The decrease of the arterial blood supply leads to reduction of pressure in the portal circulation. Intestinal muscles contract concomitantly which increases intestinal motility. The muscular wall of the esophagus also contracts which leads to closure of experimentally induced varices.

Kidneys

Terlipressin has only 3% antidiuretic effect of the native vasopressin. This residual activity is of no clinical significance. Renal blood circulation is not significantly effected in normovolemic condition. Renal blood circulation is increased, however, under hypovolemic condition.

Blood pressure

Terlipressin induces a slow haemodynamic effect which lasts 2-4 hours. Systolic and diastolic blood pressure increase mildly. More intense blood pressure increase has been observed in patients with renal hypertension and general blood vessel sclerosis.

Heart

All studies reported that no cardio-toxic effects were observed, not even under the highest dose of terlipressin. Influences on the heart, such as bradycardia, arrhythmia, coronary insufficiency, occur possibly because of reflex or direct vascular constrictive effects of terlipressin.

Uterus

Terlipressin causes significant decrease in myometrial and endometric blood flow.

Skin

The vasoconstrictive effect of terlipressin causes significant decrease in blood circulation of the skin. All studies reported obvious paleness on face and body.

In conclusion, the main pharmacological properties of terlipressin are its haemodynamic effects and its effects on smooth muscle. The centralization effect under hypovolemic condition is a desired side effect in patients with bleeding oesophageal varices.

5.2 Pharmacokinetic properties

After bolus intravenous injection terlipressin elimination follows second order kinetics. Plasma half-life was calculated as 8-12 minutes during the distribution phase (0-40 minutes) and 50-80 minutes during the elimination phase (40-180 minutes). The release of lysine-vasopressine is maintained for at least 180 minutes. Due to cleavage of the glycyl groups from terlipressin lysine-vasopressin is slowly released and reaches maximal concentrations after 120 minutes. Urine contains only 1% of the injected terlipressin, which indicates almost complete metabolism by endo- and exopeptidases of liver and kidneys.

5.3 Preclinical safety data

Non-clinical data reveal no special hazard for humans based on conventional studies of single- and repeat-dose toxicity, and genotoxicity. At doses relevant to humans, the only effects observed in animals were those attributed to the pharmacological activity of terlipressin.

Adverse reactions observed in animal studies with possible relevance to clinical use were as follows:

Due to its pharmacological effect on smooth muscles terlipressin may induce abortion in the first trimester.

An embryo-fetal study in rats demonstrated no adverse effects of terlipressin. In rabbits abortions occurred, probably related to maternal toxicity, and there were ossification anomalies in a small number of fetuses and a single isolated case of cleft palate.

No carcinogenicity studies have been performed with terlipressin.

6. Pharmaceutical particulars

6.1 List of excipients

Sodium acetate trihydrate

Sodium chloride

Acetic acid, glacial (for pH adjustment)

Water for injection.

6.2 Incompatibilities

In the absence of compatibility studies, this medicinal product must not be mixed with other medicinal products.

6.3 Shelf life

2 years

6.4 Special precautions for storage

Store in a refrigerator (2-8°C).

6.5 Nature and contents of container

Terlipressin acetate SUN 0.12 mg/ml solution for injection is packed in 10 ml clear type-I treated glass OPC (one point cut) ampoule with blue dot green band.

Pack size: 5 x 8.5ml.

6.6 Special precautions for disposal and other handling

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



**7.Manufactured in India by:
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