Maxifer IV

Iron Sucrose USP Injection

Composition:
Maxifer IV: Each 5 ml ampoule contains Iron Sucrose USP equivalent to 100 mg elemental Iron.

Pharmacological Information

Therapeutic class: Hematinic

Pharmacological action:
Administration of Iron Sucrose replenishes tissue iron stores, reverses iron depletion and iron-deficient erythropoiesis, and corrects or prevents iron deficiency anemia.

Mechanism of action :
Following intravenous administration, **Maxifer** (Iron Sucrose) is dissociated into iron and sucrose by the reticuloendothelial system and iron is transferred from the blood to a pool of iron in the liver and bone marrow. Ferritin, an iron storage protein, binds and sequesters iron in a nontoxic form, from which iron is easily available. Iron binds to plasma transferrin, which carries iron within the plasma and the extracellular fluid to supply the tissues. The transferrin receptor, located in the cell membrane, binds the transferrin iron complex, which is then internalized in vesicles. Iron is released within the cell and the transferrin- recepor complex is returned to the cell membrane. Transferrin without iron (apotransferrin) is then released to the plasma. The intracellular iron becomes (mostly) hemoglobin in circulating red blood cells (RBCs). Transferrin synthesis is increased and ferritin production is reduced in iron deficiency. The converse is true when iron is plentiful.

Pharmacokinetics Properties :
Iron disappearance from serum depends on the need for iron in the iron stores and iron utillizing tissues of the body, serum clearance of iron is expected to be more rapid in iron deficient patients treated with Iron Sucrose as compared to healthy individuals. The effects of age and gender on the pharmacokinetics of Iron Sucrose have not been studied. Distribution: Following intravenous doses of Iron Sucrose, the Iron component appears to distribute mainly in blood and to some extent in extra vascular fluid. Following IV administration iron may also distribute to some extents in the liver, spleen and bone marrow. Metabolism and Elimination: The sucrose component is eliminated mainly by urinary excretion

Clinical Information

Indications:
Maxiter is indicated for the treatment of Iron deficiency in the following indications:

- Where there is a clinical need for a rapid Iron supply
- In patients who cannot tolerate oral Iron therapy or who are non-compliant
- In active inflammatory bowel disease where oral Iron preparations are ineffective
- Treatment of iron deficiency anemia in pregnancy and in Non-dialysis dependent-chronic kidney disease (NDD-CKD) patients either receiving or not receiving an erythropoietin, Hemodialysis dependent-chronic kidney disease (HDD-CKD) patients receiving an erythropoietin or Peritoneal dialysis dependent-chronic kidney disease (PDD-CKD) patients receiving an erythropoietin

Dosage and administration:

Calculation of dosage :
The dosage has to be individually adapted according to the total iron deficit calculated with the following formula :

Total iron deficit [mg]=body weight [kg] x (target Hb-actual Hb) [g/l] x 0.24*+depot iron [mg]

Up to 35 kg body weight : target Hb=130 g/l resp. depot iron=15 mg/kg body weight.

Above 35 kg body weight : target Hb=150 g/l resp. depot iron =500 mg

*Factor 0.24=0.0034x0.07x1000 (Iron content of Hb ≃ 0.34% Blood volume ≃ 7% of body weight/Factor 1000=conversion from gm to mg).

Total amount of **Maxifer** to be administered (in ml)=$\frac{\text{Total iron deficit (mg)}}{\text{20 mg/ml}}$

Calculation of No. of Ampoules required for different body weight and different hemoglobin level

Hb level	5 kg	10 kg	15 kg	20 kg	25 kg	30 kg	35 kg	40 kg	45 kg	50 kg	55 kg	60 kg	65 kg	70 kg	75 kg	80 kg	85 kg	90 kg
Hb 60 g/l	1.5	3	5	6.5	8	9.5	12.5	13.5	15	16	17	18	19	20	21	22.5	23.5	24.5
Hb 75 g/l	1.5	3	4.5	5.5	7	8.5	11.5	12	13	14	15	16	16.5	17.5	18.5	19.5	20.5	21.5
Hb 90 g/l	1.5	2.5	3.5	5	6	7.5	10	11	11.5	12	13	13.5	14.5	15	16	16.5	17	18
Hb 105 g/l	1	2	3	4	5.5	6.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5

Calculation of dosage for iron replacement secondary to blood loss and to support autologous blood donation : The required **Maxifer** dose to compensate the iron deficit is calculated according the following formulas :

-if the quantity of blood lost is known: The administration of 200 mg iv iron (=10 ml **Maxifer**) result in an increase in Hb which is equivalent to 1 unit blood.

Iron to be replaced [mg]=number of blood units lost x 200 or

Amount of **Maxifer** needed (ml)=number of blood units lost x 10

-If the Hb level is reduced : Use the previous formula considering that the depot iron does not need to be restorted.

Iron to be replaced [mg]=body weight [kg]x0.24x(target Hb-actual Hb)[g/l]

Adults and the Elderly: **Maxifer** has exclusively to be administered intravenously by drip infusion or by slow injection or directly into the venous limb of the dialyser. **Maxifer** must not be used for intramuscular use.

As Infusion: **Maxifer** should preferably be administered by drip infusion (in order to reduce the risk of hypotensive episodes) in a dilution of 1 ml Iron Sucrose (20 mg Iron) in max. 20 ml 0.9% Sodium Chloride etc. up to 25 ml Iron Sucrose in maximum 500 ml 0.9% NaCl. Dilution must take place immediately prior to infusion and the solution must be administered as follows: 100 mg Iron in at least 15 minutes; 200 mg Iron in at least 30 minutes etc. Normal posology is to use 5-10 ml **Maxifer** once to three times a week depending on the Hemoglobin level. For the administration of the maximum tolerated dose of 7 mg Iron/kg body weight, an Infusion time of at least 3.5 hours has to be respected, independently of the total dose.

As injection: **Maxifer** can also be administered undiluted by slow intravenous injection at a rate of 1 ml Iron Sucrose (20 mg Iron) in at least 1 minute. A maximum of 10 ml Iron Sucrose (200 mg Iron) can be administered per injection in at least 10 minutes.

Children : There is limited data on children under study conditions. If there is a clinical need, it is recommended not to exceed 0.15 ml Iron Sucrose (3 mg Iron) per kg body weight 1-3 times a week as IV infusion depending on the hemoglobin level.

Contraindication:
The use of Iron Sucrose is contraindicated in patients with evidence of Iron overload, in patients with known hypersensitivity to Iron preparations or any of its inactive components, in patients with anemia not caused by Iron deficiency.

Side effect:
Iron Sucrose is generally well tolerated. However, occasionally metallic taste, headache, nausea, vomiting and hypotension may occur. Less frequently side-effects are paresthesia, abdominal disorders, muscular pain, fever, urticaria, flushing, edema of the extremities, anaphylactic (pseudoallergic) reactions and in the region of the punctured vein, phlebitis and venous spasm have been observed.

Drug interaction:
Iron Sucrose Injection should not be administered concomitantly with oral iron preparations since the absorption of oral Iron is reduced. **Incompatibility:** Do not mix with other medication or add to parenteral nutrition solution for IV infusion.

Precautions:
Iron Sucrose should be administered with caution in patients with asthma, eczema, other atopic allergies or allergic reaction to other parenteral Iron preparations, low binding capacity and/or folic acid deficiency, liver dysfunction, acute or chronic infection.

Baseline tests: Ensure Hgb, Hct, serum ferritin and transferrin saturation is determined before starting therapy and periodically during treatment. Note that serum iron levels may be reliably obtained 48 hours after IV dosing.
Blood Pressure: Monitor Blood Pressure during infusion. If hypotension occurs, slow the rate of infusion. If hypotension continues, discontinue infusion and be prepared to treat appropriately.

- Discontinue oral Iron preparations before administering parenteral Iron products. co-administration of parenteral Iron preparations may reduce absorption of oral Iron.
- The dose will be in terms of elemental Iron.
- For IV administration only but not for intradermal, subcutaneous, IM, or intra-arterial administration.
- Medication is administered 1 to 3 times/ week. Do not administer more than 3 times/week.
- Discard any unused diluted solution. Do not save unused solution for future use.
- Do not administer if particulate matter or discoloration noted.

Use in Pregnancy & Lactation: ***Pregnant Women :*** Pregnancy Category-B. No adequate and well controlled studies in pregnant women. This drug should be used during pregnancy only if clearly needed. ***Lactating mothers:*** It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when Iron Sucrose is administered to a nursing woman.

Overdosage :
Iron Sucrose should not be given to people with Iron overload and should be stopped when serum ferritin levels equal or exceed established guidelines. Particular caution should be used to avoid Iron overload where anemia that does not respond to treatment has been incorrectly diagnosed as Iron deficiency anemia. Symptoms associated with overdose or infusing Iron Sucrose too rapidly included hypotension, headache, vomiting, nausea, dizziness, joint aches, paresthesia (abnormal sensation, such as tingling or burning), abdominal and muscle pain, edema and cardiovascular collapse. Most symptoms have been successfully treated with IV fluids, hydrocortisone and/or antihistamines. Infusing the solution as recommended or at a slower rate also may alleviate symptoms.

Storage: Store in a cool (15^0C-30^0C) & dry place, protected from light. Keep out of the reach of children. Do not freeze.

Packing:
Each box contains 1 amber ampoule of 5 ml Iron Sucrose injection with 100 ml normal saline, an infusion set, alcohol pad, first aid band and a 5 ml disposable syringe.

Manufactured by
Globe Pharmaceuticals Ltd.
Bangladesh.