

Albumex[®] 20

Human Albumin 20% (200 g/L)

New Zealand

NAME OF THE MEDICINE

Human albumin, solution for intravenous injection.

DESCRIPTION

Albumex[®] 20 is prepared from pooled human plasma obtained from voluntary donors. It is prepared by a combination of the Cohn cold-ethanol fractionation process and chromatographic techniques. It is a 20% w/v protein solution which is hypo-osmotic with human serum. Albumex[®] 20 is heated at 60°C for 10 hours and incubated at low pH to inactivate viruses. The composition of Albumex[®] 20 is as follows:

Human Albumin	200 g/Litre
Sodium	48 to 100 mmol/Litre
Octanoate	32 mmol/Litre

PHARMACOLOGY

Albumin accounts quantitatively for more than half of the total protein in the plasma and represents about 10% of the protein synthesis activity of the liver. The metabolic half-life of albumin *in vivo* is about 20 days and the turnover in an adult is approximately 15g per day. There is rapid interchange of albumin between the intra- and extravascular spaces.

Albumex[®] 20 is hyperoncotic with human serum and supplies the oncotic equivalence of approximately four times its volume of human plasma. Albumex[®] 20 has two main functions: maintenance of plasma colloid osmotic pressure and carriage of intermediate products in the transport and exchange of tissue metabolites.

INDICATIONS

Hypoproteinaemia in the acutely ill patient Albumex[®] 20 is administered when there are existing or anticipated clinical problems or complications from reduced oncotic pressure, and/or as an adjunct to diuretic therapy.

Shock Albumex[®] 20 may be used for the resuscitation of patients in shock due to acute loss of blood or plasma, but 4% human albumin is preferred when available.

Burns Extensive burns are followed by sequential shifts in the distribution of body water, salt and proteins resulting in hypovolaemic shock and circulatory failure.

Initially (during the first 24 hours) there is an increased vascular permeability leading to loss of water and proteins into the extravascular compartment, and haemoconcentration. Large volumes of crystalloid solutions should be infused to restore the constricted intravascular fluid space, and smaller amounts of Albumex[®] 20 are required to maintain adequate plasma volume and colloid osmotic pressure.

Adult respiratory distress syndrome The clinical syndrome is characterised by inadequate oxygenation secondary to pulmonary interstitial oedema, complicating shock and postoperative states resulting in a decreased central venous pressure, decreased plasma albumin concentration, rising blood pressure, reduced cardiac output, lowered pulse rate and a falling renal output.

The acute condition can be controlled by diuretics and Albumex[®] 20 in amounts sufficient to maintain vital signs.

In patients who have undergone abdominal surgery, the intravenous administration of albumin solution (20%) immediately after the operation has been shown to improve lung compliance and gaseous exchange.

Haemodialysis Albumex[®] 20 may be used to assist with the rapid removal of excess extravascular fluid and to maintain perfusion pressure.

Therapeutic plasma exchange Therapeutic plasma exchange is a procedure in which approximately one plasma volume is exchanged with a colloid replacement solution. The choice of replacement fluid and its concentration are determined by the particular clinical situation and the frequency of the procedure.

Iso-oncotic albumin solution is the preferred replacement material. If the patient's serum albumin level is not maintained, concentrated albumin (20%) may be indicated. If exchange occurs less frequently than once a week, less concentrated colloids may be appropriate.

CONTRAINDICATIONS

Albumex[®] 20 must not be used if there is a history of allergy to this product. Albumin is contraindicated in patients with cardiac failure, pulmonary oedema or severe anaemia.

The infusion of Albumex[®] 20 is not justified in hypoproteinaemic states associated with chronic cirrhosis, malabsorption, protein losing enteropathies, pancreatic insufficiency or undernutrition.

In chronic nephrosis, infused albumin solution (20%) is promptly excreted by the kidneys with no relief of the chronic oedema.

PRECAUTIONS

The sodium levels in this product are 48 to 100 mmol/L. This should be noted when the product is used in patients requiring sodium restriction.

The product is normally clear or slightly opalescent but, if it appears to be turbid by transmitted light, it must not be used and the bottle should be returned unopened to the appropriate Blood Service.

Any case of infection associated with the use of the product should be reported to the appropriate Blood Service, together with details of batches given.

The colloid osmotic effect of Albumex[®] 20 is approximately four times that of plasma. Therefore, patients should always be monitored carefully in order to guard against the possibility of circulatory overload. Patients with cardiac failure, renal insufficiency or stabilised chronic anaemia often have an increased circulatory plasma volume and are therefore at special risk of developing circulatory overload. As Albumex[®] 20 is hyperoncotic, albumin must be given with (see section below ***Dilution of Concentrated Albumin 20%***) or followed by crystalloid solution in the presence of dehydration.

Administration of albumin can aggravate myocardial depression when present in patients with shock. A paradoxical effect of refractory oliguria has been reported in burns patients receiving albumin, possibly because of insufficient accompanying crystalloids. True anaphylactic

reactions occur rarely. Should an anaphylactic reaction to Albumex[®] 20 develop, the infusion should be stopped and treatment instituted with adrenaline, hydrocortisone and antihistamines, as appropriate.

It is recommended that blood pressure is monitored during administration of Albumex[®] 20.

Myocardial function (in shock), serum potassium (when pretreatment concentrations are low), platelet count (when pretreatment values are low) and prothrombin times (when these are prolonged before exchange) should also be monitored.

Albumex[®] contains trace elements of aluminium ($\leq 200\mu\text{g/L}$). Accumulation of aluminium in patients with chronic renal insufficiency has led to toxic manifestations such as hypercalcaemia, vitamin D-refractory osteodystrophy, anaemia and severe progressive encephalopathy. Therefore, when large volumes of albumin are contemplated for administration to such patients, serious consideration of these potential risks relative to the anticipated benefits should be given.

Dilution of Concentrated Albumin 20%

If Albumex[®] 20 is diluted to an iso-oncotic protein concentration (4-5% albumin) prior to administration, this must be done with an iso-osmotic electrolyte solution such as 0.9% saline. Under no circumstances should water be used since the lower tonicity will lead to intravascular haemolysis.

Hypertension

The rise in blood pressure which may follow rapid administration of albumin necessitates observation of the injured patient to detect bleeding points which failed to bleed at the lower blood pressure; otherwise, new haemorrhage and shock may occur.

Use in shock

In the treatment of shock, monitor blood pressure frequently. Widening of the pulse pressure is correlated with an increase in stroke volume or cardiac output.

Pathogen safety

This product is made from human plasma. Products made from human plasma may contain infectious agents such as viruses and theoretically Creutzfeldt-Jakob Disease (CJD) agents, that can cause disease. The risk that such products will transmit an infectious agent has been reduced by screening plasma donors for prior exposure to certain infectious agents and by testing for the presence of certain viral markers.

In addition, virus removal and inactivation procedures are included in the manufacturing process. The current procedures applied in the manufacture of this product are effective against enveloped viruses such as HIV (human immunodeficiency virus), hepatitis B and hepatitis C viruses, and the non-enveloped virus, hepatitis A. These procedures may be of limited value against the non-enveloped virus, parvovirus B19.

Despite these measures, such products may still potentially transmit disease. There is also the possibility that other known or unknown infectious agents may be present in such products.

Vaccination for patients in receipt of medicinal products from human plasma should be considered where appropriate.

Use in pregnancy

The safety of this medicinal product for use in human pregnancy has not been established in controlled clinical trials; therefore, it should be given to pregnant women only if clearly needed.

Use in lactation

No information available.

Interactions with other medicines

Hypotension has been reported in patients given albumin who are on ACE (angiotensin-converting enzyme) inhibitors (see also **COMPATIBILITY WITH OTHER FLUIDS**).

ADVERSE EFFECTS

Adverse reactions reported with albumin solutions in general may include chills, fever, flushing, headache, dyspnoea, nausea, vomiting, increased salivation and allergic reactions (hypotension, urticaria, skin rashes, anaphylaxis).

Adverse reactions to albumin solutions are uncommon and are usually mild and transient. More serious events may include rigors, hypotension, lowered serum electrolyte levels (potassium, calcium, bicarbonate), lowered total serum protein levels, low platelet count and increased prothrombin time.

DOSAGE AND ADMINISTRATION

Dosage

Hypoproteinaemia in the acutely ill patient The usual daily dose is 50-75 g. The rate of administration should not exceed 2 mL per minute, as more rapid infusion may precipitate circulatory overload and pulmonary oedema.

In some cases a dose of albumin is added to a suitable crystalloid solution in the proportion of 1 mL Albumex[®] 20 to 4 mL crystalloid solution (see **PRECAUTIONS, *Dilution of Concentrated Albumin 20%***) and administered by the usual intravenous technique.

Shock If concentrated albumin (> 4-5%) is given, it should be accompanied by the intravenous infusion of a crystalloid solution. Failure to supply this additional fluid may lead to dehydration of the tissues.

The precise nature and strength of the crystalloid solution will depend on the requirements of the patient for electrolytes and fluid.

The patient's haemodynamic response should be monitored and the usual precautions against circulatory overload observed.

The dose should be determined by the patient's condition and response to treatment. The usual initial dose of 20 g may be administered as a blood volume expander at a rate of 2 to 4 mL per minute. The rate of infusion may be increased in emergencies and repeated in 15 to 30 minutes if necessary. The total dose should not exceed the level of albumin found in the normal individual i.e. about 2 g per kg body weight in the absence of active bleeding.

Burns The usual dose is 20 to 80 g human albumin given daily at the rate of about 1 mL per minute.

Beyond 24 hours, Albumex[®] 20 can be used to maintain plasma colloid osmotic pressure. A reasonable goal is the maintenance of a plasma albumin concentration of 25 g/L or a colloid osmotic pressure of 20 mmHg.

The continuing need for albumin is occasioned by losses from denuded areas and decreased albumin synthesis.

Adult respiratory distress syndrome Commence with a dose of 50 g human albumin (equivalent to 250 mL of Albumex[®] 20) over the first 24 hours together with diuretic therapy. Thereafter the dose is adjusted to maintain vital signs, particularly central venous pressure, urine output and plasma albumin concentration.

Haemodialysis Patients with significant fluid overload may benefit from the administration of 100-200 mL of Albumex[®] 20 at the end of the dialysis procedure.

Therapeutic plasma exchange Replace albumin removed on a gram-for-gram basis, e.g. removal of 2.5 litres of plasma should be accompanied by replacement of 125 g of human albumin (625 mL of Albumex[®] 20), either prediluted (see **PRECAUTIONS, Dilution of Concentrated Albumin 20%**) or followed by 4-5 volumes of an appropriate crystalloid solution.

Administration

Albumex[®] 20 should always be administered by intravenous infusion through a standard IV infusion giving set.

Albumex[®] 20 does not contain an antimicrobial preservative. It must, therefore, be used immediately after opening the bottle. Any unused solution should be discarded appropriately. Use in one patient on one occasion only. Do not use if the solution has been frozen. If the product was stored in the refrigerator it should be allowed to reach room temperature or body temperature before administration.

The following procedure is recommended for the 100 mL pack size:

1. Remove the plastic cover from the seal.
2. Apply a suitable antiseptic to the exposed part of the rubber stopper and allow to dry.
3. Stand the bottle upright and insert the air vent needle vertically in one of the indentations of the stopper. It is preferable to use a long airway needle fitted with a filter. If not available, a short needle attached to a non-wettable filter may be used.
4. Clamp the tubing of the giving set and insert the perforator vertically through one of the other indentations of the stopper. **Should the stopper become dislodged, do not use this bottle and discard the solution appropriately.**
5. Invert the bottle and attach the hanger to a support approximately one metre above the patient.
6. Allow the tubing to fill by adjusting the clamp. Insert the giving set needle into a vein and adjust the rate of flow.
7. When the bottle is empty, clamp the tubing and transfer the air vent needle and the needle at the upper end of the giving set to a further bottle of Albumex[®] 20 or to a bottle containing a crystalloid solution, according to requirements.

8. Should leakage become evident during administration, cease the infusion and discard the solution appropriately. Recommence the infusion with a new bottle and giving set.

The following procedure is recommended for the 10 mL (paediatric) pack size:

1. Remove the plastic cover from the seal.
2. Apply a suitable antiseptic to the exposed part of the rubber stopper and allow to dry.
3. Stand the bottle upright, insert the needle vertically in the stopper and draw up the product.
4. Infuse the product into appropriate chamber as required e.g. infusion set.

COMPATIBILITY WITH OTHER FLUIDS

Albumex[®] 20 should not be mixed with protein hydrolysates, amino acid solutions, solutions containing alcohol, or solutions containing drugs that bind to albumin e.g. calcium channel blockers.

OVERDOSAGE

Excess human albumin may lead to circulatory overload (see **PRECAUTIONS**).

PRESENTATION AND STORAGE CONDITIONS

Albumex[®] 20 is issued in two sizes:

- 2 g of human albumin in 10 mL of electrolyte solution;
- 20 g of human albumin in 100 mL of electrolyte solution.

Store below 30°C. This product must not be frozen. Protect from light. Do not use after the expiry date.

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General Sale Medicine

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