

Data Sheet

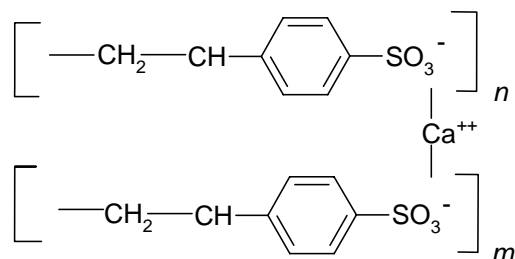
Calcium Resonium

Name of the Medicine

Non-proprietary Name

Calcium polystyrene sulfonate

Chemical Structure



CAS Number

37286-92-3

Description

Calcium Resonium contains 99.93% calcium polystyrene sulfonate ground and flavoured to a buff coloured fine powder with a vanilla odour and sweet taste. The sodium content of Calcium Resonium is less than 1 mg/g. Calcium content is about 8% w/w (1.6-2.4 mmol/g).

Calcium Resonium also contains saccharin sodium and vanillin

Pharmacology

Class

Calcium polystyrene sulfonate is a cation exchange resin prepared in the calcium phase.

Site and Mode of Action

Each gram of resin has a theoretical *in vitro* exchange capacity of about 1.3 to 2 millimoles of potassium. However, *in vivo*, the actual amount of potassium bound will be less than this. The resin is insoluble in water.

Absorption

Calcium polystyrene sulfonate is not absorbed from the gastrointestinal tract.

Distribution

Calcium polystyrene sulfonate removes potassium from the body by exchanging it within the gut for calcium. For the most part, this action occurs in the large intestine, which excretes potassium to a greater degree than does the small intestine. The efficiency of potassium exchange is unpredictable and variable. The resin is not selective for potassium.

Indications

Calcium Resonium is an ion-exchange resin. It is recommended for the treatment of hyperkalaemia associated with anuria and severe oliguria. It is also used to treat

hyperkalaemia in patients requiring dialysis and in patients on regular haemodialysis or on prolonged peritoneal dialysis.

Contraindications

- History of hypersensitivity to polystyrene sulfonate resins.
- Serum potassium levels less than 5 mmol/L.
- Conditions associated with hypercalcaemia (eg. hyperparathyroidism, multiple myeloma, sarcoidosis or metastatic carcinoma).
- Obstructive bowel disease.
- Calcium Resonium should not be administered **orally** to neonates and is contraindicated in neonates with reduced gut motility (eg. post-operatively or drug induced).

Precautions

The possibility of severe potassium depletion should be considered and adequate clinical and biochemical control is essential during treatment especially in patients on digoxin. Administration of the resin should be stopped when the serum potassium falls to 5 mmol/litre.

Serum calcium levels should be estimated at weekly intervals to detect the early development of hypercalcaemia, and the dose of resin adjusted to levels at which hypercalcaemia and hypokalaemia are prevented. Hypomagnesaemia may also occur and serum magnesium levels should be monitored. Patients should be monitored for all applicable electrolyte disturbances.

In the event of clinically significant constipation, treatment should be discontinued until normal bowel movement has resumed. Magnesium containing laxatives should not be used (see **Interactions with Other Medicines**).

With oral administration, care should be taken to avoid aspiration, which may lead to bronchopulmonary complications.

Concomitant use of sorbitol and calcium polystyrene sulfonate is not recommended since cases of intestinal necrosis, which may be fatal, have been reported (see Interactions with Other Medicines and **ADVERSE EFFECTS**). Since effective lowering of serum potassium with Calcium Resonium may take hours to days, treatment with this drug alone may be insufficient to rapidly correct severe hyperkalaemia, often associated with states of rapid tissue breakdown eg burns or trauma. In such instances, some form of dialysis may be imperative. If hyperkalaemia is so marked as to constitute a medical emergency, immediate treatment with intravenous glucose and insulin or intravenous sodium bicarbonate may be necessary as a temporary measure to lower serum potassium while other long-term potassium lowering therapy is being prepared.

Use in Pregnancy and Lactation

No data are available regarding the use of polystyrene sulfonate resins in pregnancy and lactation. The administration of Calcium Resonium in pregnancy and during breast feeding therefore, is not advised unless, in the opinion of the physician, the potential benefits outweigh any potential risks.

Paediatric Use

In neonates, Calcium Resonium **should not** be given by the oral route.

In both children and neonates, particular care is needed with rectal administration as excessive dosage or inadequate dilution could result in impaction of the resin.

Due to the risk of digestive haemorrhage or colic necrosis, particular care should be observed in premature infants or low birth weight infants.

Interactions with Other Medicines

Cation donating agents may reduce the potassium binding effectiveness of Calcium Resonium.

Non-absorbable cation containing antacids and laxatives such as magnesium hydroxide and concomitant oral use of cation exchange resins has been reported to cause systemic alkalosis.

Aluminium hydroxide: intestinal obstruction due to concretions of aluminium hydroxide has been reported when taken in combination with the resin (sodium form).

Digoxin: the toxic effects of digoxin on the heart, especially ventricular arrhythmias and AV nodal depression, are likely to be exaggerated if hypokalaemia and/or hypercalcaemia develop.

Lithium: Possible decrease of lithium absorption.

Thyroxine: Possible decrease of thyroxine absorption.

Concomitant use of sorbitol with calcium polystyrene sulfonate is not recommended due to cases of intestinal necrosis which may be fatal (see **PRECAUTIONS AND ADVERSE EFFECTS**).

Adverse Effects

Gastric irritation, anorexia, nausea, vomiting, constipation and occasionally diarrhoea may also occur. Faecal impaction following rectal administration has been reported in children and gastro-intestinal concretions following oral administration to neonates. Intestinal obstruction has also been reported although this has been extremely rare and, possibly, a reflection of coexisting pathology, excessive dosage or inadequate dilution of the resin.

Hypokalaemia may occur.

Cases of hypomagnesemia have been reported.

Hypercalcaemia has been reported in well-dialysed patients receiving calcium resin, and occasionally in patients with chronic renal failure. Many patients in chronic renal failure have low serum calcium and high serum phosphate, but some, who cannot be screened out beforehand, show a sudden rise in serum calcium to high levels after therapy. The risk emphasises the need for adequate biochemical control.

Some cases of acute bronchitis and/or bronchopneumonia associated with inhalation of calcium polystyrene sulfonate have been described.

Ischemic colitis, gastrointestinal tract ulceration or necrosis which could lead to intestinal perforation have been reported.

Intestinal necrosis has been reported with concomitant use of sorbitol (see **PRECAUTIONS**).

Dosage and Administration

Calcium Resonium is for oral or rectal administration only. The dosage recommendations detailed below are a guide only; the precise requirements should be decided on the basis of regular clinical and serum electrolyte determinations.

Adults, including the Elderly

Oral

Usual dose 15 g three or four times a day. The resin is given by mouth as a suspension in a small amount of water (3-4 mL per gram of resin), or it may be mixed with some sweetened vehicle (but not fruit juices, which contain potassium).

Rectal

In cases where vomiting or upper gastrointestinal problems, including paralytic ileus, may make oral administration difficult, the resin may be given rectally as a suspension of 30 g resin in 150 mL water or 10% dextrose in water, as a daily retention enema. In the initial stages, administration by this route as well as orally may help to achieve a more rapid lowering of the serum potassium level.

The enema should if possible be retained for at least nine hours following which the colon should be irrigated to remove the resin. If both routes are used initially it is probably unnecessary to continue rectal administration once the oral resin has reached the rectum.

Children

Oral

Lower doses should be used, as a guide, 1 mmol potassium per gram of resin. The initial dose is 1 g/kg body weight daily in divided doses, in acute hyperkalaemia. For maintenance therapy dosage may be reduced to 0.5 g/kg body weight daily in divided doses.

The resin is given orally, preferably with a drink (not a fruit juice because of the high potassium content) or a little jam or honey.

Rectal

When the resin cannot be given by mouth, it may be given rectally using a dose at least as great as that which would be given orally, diluted in the same ratio as described for adults. Following retention of the enema, the colon should be irrigated to ensure adequate removal of the resin.

Neonates

Calcium Resonium should not be given by the oral route, only rectal administration should be considered. With rectal administration, the minimum effective dosage within the range 0.5 g/kg to 1 g/kg should be employed, diluted as for adults and with adequate irrigation to ensure recovery of the resin.

Overdosage

Hypokalaemia may be manifest clinically by signs of irritability, confusion, delayed thought processes, severe muscle weakness, hyporeflexia or paralysis. ECG abnormalities may be evident and cardiac arrhythmias may occur. In the event of overdosage the resin should be removed from the alimentary tract by the use of laxatives or enemas, and appropriate measure should be taken to restore serum potassium levels to normal, and to reduce blood calcium levels if these are raised.

Contact the Poisons Information Centre for advice on management of overdosage.

Presentation and Storage Conditions

HDPE containers of 300 g each containing a plastic scoop which, when filled level, contains approximately 15 g.

Store below 30°C.

Suspensions of the resin should be freshly prepared and not stored beyond 24 hours.

Medicine Classification

Prescription Medicine.

Name and Address of the Sponsor

sanofi-aventis new zealand limited
Level 8, James & Wells Tower
56 Cawley Street
Ellerslie
Auckland
Phone: (09) 580 1810

Date of Preparation

5 August 2010