

## **1. NAME OF THE MEDICINAL PRODUCT**

Calcium Gluconate Injection BP. 10% w/v.

## **2. QUALITATIVE AND QUANTITATIVE COMPOSITION**

Each 10ml of solution contains 9.57% w/v calcium gluconate BP

## **3. PHARMACEUTICAL FORM**

Clear, colourless, sterile solution for injection, free from particles or crystals, intended for parenteral administration to human beings.

## **4. CLINICAL PARTICULARS**

### **4.1. Therapeutic Indications**

Parenteral administration of calcium is indicated where the pharmacological action of a high calcium ion concentration is required as, for example, in acute hypocalcaemia, cardiac resuscitation and some cases of neonatal tetany.

Intravenous injections of calcium have been used in the treatment of the acute colic of lead poisoning, and as an adjunct in the treatment of acute fluoride poisoning. Also for the prevention of hypocalcaemia in exchange transfusions.

### **4.2. Posology and Method of Administration**

Calcium Gluconate Injection BP is for administration by slow intravenous or deep intramuscular injection.

The normal concentration of calcium in plasma is within the range of 2.25 - 2.75 mmol or 4.5 - 5.5 mEq per litre. Treatment should be aimed at restoring or maintaining this level.

During therapy, serum calcium levels should be monitored closely.

Acute hypocalcaemia: 10 - 20ml (2.25 - 4.5 mmol)

Fluoride or lead poisoning: 0.3ml/kg (0.0675 mmol/kg)

Neonatal tetany: 0.3ml/kg (0.0675 mmol/kg)

Cardiac resuscitation: 7 - 15ml (1.575 - 3.375 mmol). Note that the absolute amount of calcium required for this indication is difficult to determine and may vary widely.

Intravenous injections should be administered very slowly (3 minutes for 10ml).

Intramuscular injections should be given deep in the gluteus medius muscle via a long needle; however, intramuscular injections are not recommended for children.

Elderly patients : Although there is no evidence that tolerance of Calcium Gluconate Injection is directly affected by advanced age, factors that may sometimes be associated with ageing, such as impaired renal function and inadequate diet, may indirectly affect tolerance and may require a reduction in dosage.

Renal function declines with age and prior to prescribing this product to elderly patients it should be considered that Calcium Gluconate injection is contraindicated (See section 4.3) for repeated or prolonged administration in patients with impaired renal function.

### **4.3. Contra-Indications**

Aluminium can be leached from ampoule glass by Calcium Gluconate. In order to limit the exposure of patients to aluminium, especially those with impaired renal function and children (less than 18 years of age), Calcium Gluconate Injection BP is not intended for use in the preparation of Total Parenteral Nutrition (TPN).

This product should not be used for repeated or prolonged treatment, including as an intravenous infusion, in children (less than 18 years of age) and those with impaired renal function, due to the risk of exposure to aluminium.

This product is contraindicated in:

- Hypercalcaemia (e.g. in hyperparathyroidism, hypervitaminosis D, neoplastic disease with decalcification of bone)
- Severe hypercalciuria
- Severe renal failure
- Patients receiving cardiac glycosides

### **4.4. Special Warnings and Special Precautions for Use**

Plasma calcium levels and calcium excretion should be monitored when calcium is administered parenterally, especially in children, in chronic renal failure or where there is evidence of calculi formation within the urinary tract. If plasma calcium exceeds 2.75 mmol per litre or if 24-hour urinary calcium excretion exceeds 5mg/kg, treatment should be discontinued immediately as cardiac arrhythmias may occur at these levels.

Calcium salts should be used with caution in patients with impaired renal function or with nephrocalcinosis. Care is also required in patients with cardiac disease. (See Section 4.3)

### **4.5. Interaction with other Medicinal Products and other Forms of Interaction**

The effects of digoxin and other cardiac glycosides may be accentuated by calcium and digitalis intoxication may be precipitated.

### **4.6. Pregnancy and Lactation**

Calcium Gluconate Injection should be used during pregnancy only if considered to be essential by the physician. Calcium is excreted in breast milk and this should be borne in mind when administering calcium to women who are breast-feeding their infants.

### **4.7. Effects on Ability to Drive and Use Machines**

Nil.

#### **4.8. Undesirable Effects**

If Calcium Gluconate Injection is administered too rapidly, nausea, vomiting, sweating, hypotension and vaso motor collapse, possibly fatal, may occur. Soft tissue calcification due to extravasation of calcium solutions has been reported. Injection of calcium salts intramuscularly can cause local irritation.

#### **4.9. Overdose**

Excessive administration of calcium salts leads to hypercalcaemia. Symptoms of hypercalcaemia may include anorexia, nausea, vomiting, constipation, abdominal pain, muscle weakness, polydipsia, polyuria, mental disturbances, bone pain, nephrocalcinosis, renal calculi, and, if severe, cardiac arrhythmia and coma.

Severe hypercalcaemia should be treated with infusion of sodium chloride, intravenously, to expand the extracellular fluid volume. This may be given with or followed by frusemide to increase calcium excretion. If this treatment is unsuccessful, other drugs which may be used include calcitonin, the biphosphates, disodium edetate, or phosphates. Haemodialysis may be considered as a last resort. During treatment of overdosage, serum electrolytes should be monitored carefully.

### **5. PHARMACOLOGICAL PROPERTIES**

#### **5.1 Pharmacodynamic Properties**

Calcium is an essential body electrolyte. It is necessary for the functional integrity of nerve and muscle and is essential for muscle contraction, cardiac function and coagulation of the blood.

Calcium homeostasis is mainly regulated by three endocrine factors: - parathyroid hormone is secreted in response to a fall in plasma calcium concentration and acts by accelerating calcium transfer from bone and by increasing its intestinal absorption and its renal reabsorption; calcitonin lowers plasma calcium by decreasing bone resorption and by increasing renal excretion of the ion; vitamin D stimulates intestinal absorption of calcium and decreases its renal excretion.

The cytoplasmic concentration of calcium is normally maintained at very low levels of about 0.1 - 1.0  $\mu\text{mol}$  per litre by the extrusion of calcium from the cell and by its sequestration within cellular organelles, particularly the endoplasmic reticulum (called the sarcoplasmic reticulum, in muscle fibres). Various electrical or chemical stimuli trigger the influx of calcium ions across the plasma membrane or release of the ion from cellular stores. These calcium ions interact with high-affinity binding sites on specific intracellular proteins, such as troponin, and thus regulate a number of functional and metabolic processes.

Calcium ions are essential for normal function of the neuromuscular apparatus. Hypocalcaemia causes a decrease in the threshold for excitation, resulting in tetany. Hypercalcaemia increases the threshold for excitation of nerve and muscle, leading to muscle weakness and lethargy. Calcium ions are necessary for muscle contraction. By binding to troponin, calcium removes the inhibitory effect of troponin on the interaction of actin and myosin.

Calcium ions also play an important role in stimulus-secretion coupling in most exocrine and endocrine glands.

Calcium ions are essential for normal excitation-contraction coupling in cardiac muscle, and for the conduction of electrical impulses in certain regions of the heart, especially through the AV node. The initiation of contraction in vascular and other smooth muscle is also dependent on calcium ions. These cardiac and vascular smooth muscle effects can be opposed by various calcium-channel blocking drugs in the treatment of angina, hypertension and cardiac arrhythmias.

Calcium ions are also involved in both the intrinsic and extrinsic pathways of blood coagulation.

## **5.2 Pharmacokinetic Properties**

Calcium is absorbed from the small intestine and, generally, about one third of ingested calcium is absorbed. Absorption is facilitated by Vitamin D and by parathyroid hormone. Calcium is excreted mainly in the urine with some faecal loss. Urinary excretion is the net result of the quantity filtered and the amount re-absorbed. The tubular re-absorption of calcium is enhanced by Vitamin D and by parathyroid hormone, whereas calcitonin increases the urinary excretion of calcium ions. Calcium is also excreted in saliva, bile, pancreatic juice, sweat and in breast milk.

## **5.3 Pre-clinical Safety Data**

No further relevant information other than that which is included with other sections of the Summary of Product Characteristics.

# **6. PHARMACEUTICAL PARTICULARS**

## **6.1 List of Excipients**

Calcium-d-saccharate BP  
Water for Injections BP

## **6.2 Incompatibilities**

Calcium salts can form complexes with many drugs, and this may result in a precipitate. Calcium salts are incompatible with oxidising agents, citrates, soluble carbonates, bicarbonates, phosphates, tartrates and sulphates. Physical incompatibility has also been reported with amphotericin, cephalothin sodium, cephazolin sodium, cephmandole nafate, novobiocin sodium, dobutamine hydrochloride, prochlorperazine, and tetracyclines.

## **6.3 Shelf-Life**

3 years (36 months).

If only part of an ampoule is used, discard the remaining solution.

## **6.4 Special Precautions for Storage**

Protect from light.  
Store below 25°C.

## **6.5 Nature and Contents of Container**

10ml, clear glass ampoules, glass type 1 Ph.Eur. packed in cardboard cartons to contain 10 x 10ml ampoules.

## **6.6 Instruction for Use, Handling and Disposal**

For slow I.V. or deep I.M. injection.

Use as directed by the physician.

If only part of an ampoule is used, discard the remaining solution.

Keep out of reach of children.

## **7. MARKETING AUTHORISATION HOLDER**

Antigen International Ltd.,  
Roscrea,  
Co. Tipperary,  
Ireland.

## **8. MARKETING AUTHORISATION NUMBER**

PL 2848/5914R.

## **9. DATE OF FIRST AUTHORISATION / RENEWAL OF THE AUTHORISATION**

22/8/1997

## **10. DATE OF (PARTIAL) REVISION OF THE TEXT**

10<sup>th</sup> September 2010