

ERACOBAL FORTE / ERACOBAL INJ.

FOR I.M./I.V. INJ. ONLY

Composition :

ERACOBAL FORTE INJ.

Each 1ml. contains :

Methylcobalamin 1500mcg.

Benzyl Alcohol I.P. 1.5% v/v

Water for Injection I.P. q.s.

ERACOBAL INJ.

Each 2ml. contains :

Methylcobalamin 1000mcg.

Benzyl Alcohol I.P. 2% v/v

(as preservative)

Water for Injection I.P. q.s.

DESCRIPTION :

Methylcobalamin is a form of vitamin B₁₂, and is also written as MeB₁₂. It is one of four cobalamin compounds that the human body is able to metabolize. A cobalamin compound contains a central cobalt ion, with one of four particular groups attached to its upper ion which are methyl group.

All Vitamin B₁₂ compounds are soluble in water, and naturally-occurring forms of B₁₂ such as Methylcobalamin - are produced by bacteria. These bacteria are present in the human liver, but the cobalamin compounds produced there are not usable by the body, and are expelled out with feces. In order to obtain the required amount of Vitamin B₁₂ from dietary sources, humans must consume animal products.

Methylcobalamin features an octahedral cobalt (III) centre.

Methylcobalamin plays a key role in the normal functioning of the brain and nervous system, and for the formation of blood. We need methylcobalamin for the healthy development and sustenance of our circulatory, immune and nervous systems. Methylcobalamin is the only active form of Vitamin B₁₂ in the brain outside the mitochondrion. It is normally involved in the metabolism of every cell of the human body, especially affecting DNA synthesis and regulation, but also fatty acid synthesis and energy production.

Methylcobalamin can be used to prevent or treat pathology arising from a lack of vitamin B₁₂ (vitamin B₁₂ deficiency), such as pernicious anemia. It is also used in the treatment of peripheral neuropathy, diabetic neuropathy, and as a preliminary treatment for amyotrophic lateral sclerosis.

MECHANISM OF ACTION :

Pharmacodynamics:

Vitamin B₁₂ is used in the body in two forms, methylcobalamin and 5-deoxyadenosyl cobalamin. The enzyme methionine synthase needs methylcobalamin as a cofactor. This enzyme is involved in the conversion of the amino acid homocysteine into methionine which is, in turn, required for DNA methylation. The other form, 5-deoxyadenosyl cobalamin, is a cofactor needed by the enzyme that converts L-methylmalonyl-CoA to succinyl-CoA. This conversion is an important step in the extraction of energy from proteins and fats. Furthermore, succinyl CoA is necessary for the production of hemoglobin, the substance that carries oxygen in red blood cells.

Vitamin B12, or methylcobalamin, is essential to growth, cell reproduction, hematopoiesis, and nucleoprotein and myelin synthesis. Cells characterized by rapid division (epithelial cells, bone marrow, myeloid cells) appear to have the greatest requirement for methylcobalamin. Vitamin B12 can be converted to coenzyme B12 in tissues; in this form it is essential for conversion of methylmalonate to succinate and synthesis of methionine from homocysteine (a reaction which also requires folate). In the absence of coenzyme B12, tetrahydrofolate cannot be regenerated from its inactive storage form, 5-methyl tetrahydrofolate, resulting in functional folate deficiency. Vitamin B12 also may be involved in maintaining sulfhydryl (SH) groups in the reduced form required by many SH-activated enzyme systems. Through these reactions, vitamin B12 is associated with fat and carbohydrate metabolism and protein synthesis. Vitamin B12 deficiency results in megaloblastic anemia, GI lesions, and neurologic damage (which begins with an inability to produce myelin and is followed by gradual degeneration of the axon and nerve head). Vitamin B12 requires an intrinsic factor-mediated active transport for absorption, therefore, lack of or inhibition of intrinsic factor results in pernicious anemia.

Pharmacokinetics :

Mecobalamin is the neurologically active form of vitamin B12 and occurs as a water-soluble vitamin in the body. It is readily absorbed in distal half of the ileum. Once absorbed, vitamin B12 is highly bound to transcobalamin II, a specific B-globulin carrier protein and is distributed and stored primarily in the liver as coenzyme B12. The bone marrow also stores a significant amount of the absorbed vitamin B12. This vitamin crosses the placenta and is distributed into breast milk. Enterohepatic recirculation conserves systemic stores. The half-life is about 6 days (400 days in the liver). Elimination is primarily through the bile. It is a cofactor in the enzyme methionine synthase, which functions to transfer methyl groups for the regeneration of methionine from homocysteine. In anaemia, it increases erythrocyte production by promoting nucleic acid synthesis in the bone marrow and by promoting maturation and division of erythrocytes.

Absorption : Peak plasma concentrations after 3 hr (oral); 0.9 hr (IM); 3 min (IV).

Excretion : Excess methylcobalamin is excreted unchanged in the urine.

BENEFITS AND USAGE :

Methylcobalamin is indicated for the treatment of pernicious anemia (due to lack of or inhibition of intrinsic factor) and for prevention and treatment of Vitamin B12 deficiency. It helps the body use fats and carbohydrates for energy, assists it in making new proteins, and is also important for the production of normal cells, nerves, blood, and DNA. Methylcobalamin (MeCbl) may provide better treatments for nervous disorders through effective systemic or local delivery. As an auxiliary agent, MeCbl has been always used to treat many diseases, such as Alzheimer's disease syndromes. In addition, MeCbl improved nerve conduction in either patient of diabetic neuropathy. MeCbl also improved visual function, rheumatoid arthritis, Bell's palsy, and sleep-wake rhythm disorder.

OTHER USAGE:

Methylcobalamin is the only active form of B12 found within the Central Nervous System (CNS).

Assists in the reduction of elevated Homocysteine. Elevated Homocysteine has been linked to increased cardiovascular risk of disease.

Supports Immune system regulation and repair of damaged myelin sheath acts to reverse nerve damage and promote nerve cell regeneration.

Increased metabolic function and supports healthy red blood cells and is used to treat Anemia.

Protects against neurological disease and aging. Improvement of mental dysfunction in the elderly. Supportive treatment in HIV.

Diabetic Peripheral Neuropathic Pain

Clinical symptoms in legs, such as paresthesia, burning pains, and spontaneous pain, were ameliorated by MeCbl. Clinical evidence proved that MeCbl had the capacity to inhibit the neuropathic pain associated with diabetic neuropathy.

Low Back Pain

The causes of low back pain are extensive, infection, inflammatory disorders, structural disorders of the spine itself, and disk herniation, are somewhat more common, and together account for back pain. Now a day MeCbl is becoming a decent choice for the therapy to the chronic low back pain. Neurogenic claudication distance was improved significantly after the application of MeCbl.

CONTRAINDICATION AND PRECAUTION :

General : Methylcobalamin is contraindicated in patients with methylcobalamin hypersensitivity or hypersensitivity to any of the medication components. Methylcobalamin is also contraindicated in patients with cobalt hypersensitivity because methylcobalamin contains cobalt. In the case of suspected cobalt hypersensitivity, an intradermal test dose should be administered because anaphylactic shock and death have followed parenteral administration of methylcobalamin.

Eracobal Injection contains benzyl alcohol as a preservative. Benzyl alcohol may cause allergic reactions. Methylcobalamin injections should be used cautiously in those patients with benzyl alcohol hypersensitivity.

Neonates: Methylcobalamin, vitamin B12 preparations containing benzyl alcohol should be avoided in premature neonates because benzyl alcohol has been associated with 'gaspings syndrome,' a potentially fatal condition characterized by metabolic acidosis and CNS, respiratory, circulatory, and renal dysfunction.

Elderly : Clinical studies have not identified differences in responses between elderly and younger patients. Generally, dose selection for elderly patients should be done with caution. Elderly patients tend to have a greater frequency of decreased hepatic, renal, or cardiac function, and also have concomitant disease or receiving other drug therapy. Start with doses at the lower end of the dosing range.

INTERACTIONS:

Ethanol : The heavy consumption of ethanol for greater than 2 weeks has been reported to reduce the absorption of Methylcobalamin, vitamin B12. Patients should be aware that heavy, chronic ethanol use may counteract the therapeutic effects of vitamin B12 , such patients with regular and chronic ethanol consumption be monitored for the desired therapeutic response to vitamin B12.

Proton Pump Inhibitors : From a study it has established that omeprazole, in doses of 20 mg—40 mg per day, caused a significant decrease in the oral absorption of methylcobalamin, vitamin B12. Theoretically this interaction is possible with other proton pump inhibitors (PPIs), although specific clinical data are lacking. Patients receiving long-term therapy with omeprazole or other proton pump inhibitors (PPIs) should be monitored for signs of B12 deficiency.

Chloramphenicol: Chloramphenicol can antagonize the hematopoietic response to Methylcobalamin, through interference with erythrocyte maturation. Chloramphenicol is known to cause bone marrow suppression, especially when serum concentrations exceed 25 mcg/ml. Aplastic anemia and hypoplastic anemia are known to occur after chloramphenicol administration.

Food : Interactions between foods and oral or injectable forms of methylcobalamin are not expected.

ADVERSE REACTION :

In most cases, methylcobalamin is nontoxic, even in large doses. Adverse reactions reported following methylcobalamin administration include headache, infection, nausea/vomiting, paresthesias, and rhinitis. Some patients have also experienced anxiety, mild transient diarrhea, ataxia, nervousness, pruritus, transitory exanthema, and a feeling of swelling of the entire body.

During the initial treatment period with methylcobalamin, pulmonary edema and congestive heart failure have reportedly occurred early in treatment with parenteral methylcobalamin. This is believed to result from the increased blood volume induced by methylcobalamin. Peripheral vascular thrombosis has also occurred.

Hypokalemia and thrombocytosis could occur upon conversion of severe megaloblastic anemia to normal erythropoiesis with methylcobalamin therapy. Therefore, monitoring of the platelet count and serum potassium concentrations are recommended during therapy.

Consult immediately to health care provider if patient experiencing any signs of an allergic reaction: skin rash, itching or hives, swelling of the face, lips, or tongue, blue tint to skin, chest tightness, pain, difficulty breathing, wheezing, dizziness, red, swollen painful area on the leg.

DOSAGE :

Parenteral :

Peripheral neuropathies Adult: As per direction of physician.

Megaloblastic anaemia caused by vitamin B12 deficiency Adult: As per direction of physician.

Maintenance dose: As per direction of physician.

STORAGE :

Store in a dry place at room temperature. Keep container tightly closed and protected from light. Handle with great care since the substances is hygroscopic.

PRESENTATION :

Eracobal Forte Inj.– 5 x 1ml. ampoule tray pack.

Eracobal Inj. – 5 x 2ml. ampoules in amber colored pack in a outer carton.