**Composition**

*Each soft gelatin capsule contains:*
- Vitamin A BP 5000 iu,
- Calciferol BP 500 iu,
- Ascorbic acid BP 40 mg,
- Thiamine mononitrate BP 2.5 mg,
- Riboflavin BP 2.5 mg,
- Pyridoxine hydrochloride BP 1 mg,
- Nicotinamide BP 20 mg,
- Calcium pantothenate BP 5 mg,
- dl-alpha-Tocopheryl acetate BP 2 iu.

*Excipients:*
- Soya bean oil, fat mixture, soya lecithin,
- gelatin, glycerine, sorbitol, ethyl parahydroxybenzoate, propyl parahydroxybenzoate, ponceau 4R.

**Properties**

*Pharmacodynamics*

Vitamin A, fat-soluble vitamin important in growth, development and maintenance of epithelial tissue and for vision.

Calciferol, fat-soluble vitamin important in calcium and phosphate homeostasis and in bone mineralisation.

Ascorbic acid, water-soluble vitamin important in synthesis of collagen and intercellular material.

Thiamine, water-soluble vitamin important in carbohydrate metabolism.

Riboflavin, water-soluble vitamin important in catabolism.

Pyridoxine, water soluble vitamin mainly important in amino acid metabolism but also plays a part in carbohydrate and fat metabolism.

Nicotinamide, water soluble, converted to NAD and NADP in which form plays an important part in electron transfer in respiratory biochemistry.

Calcium pantothenate, which forms part of coenzyme A.

dl alpha-tocopheryl acetate, fat-soluble vitamin which acts as an antioxidant preventing oxidation of polyunsaturated fatty acids.

*Pharmacokinetics*

The fat-soluble vitamins A and D (calciferol) are well absorbed from the GI tract. They are stored in the liver (vitamin A) or in adipose and muscle tissue (calciferol). They are bound to specific alpha-globulins when in the blood.

Tocopheryl acetate is absorbed from the GI tract following solubilisation by bile and is dependent on normal pancreatic function. It is absorbed via the lymphatic system. It is partially metabolised in the liver but most is slowly excreted in the bile.

The water-soluble vitamins are well absorbed from the GI tract. They tend not to be stored in the body and are excreted unchanged or partially oxidised in the urine.

**Indications**

As a supplement of multiple vitamins in situations of special dietary need. Not intended for the correction of individual vitamin deficiencies.

**Contraindications**

Oral administration in the treatment of deficiency state in malabsorption syndromes.

Hypersensitivity to any of the ingredients, history of hypervitaminoses A or D, sarcoidosis, hypercalcaemia, abnormal metabolic sensitivity to vitamin D.

Do not take vitamin A supplements if you are pregnant or likely to become pregnant except on the advice of a physician or antenatal clinic.

**Side Effects**

*Vitamin A*

Vitamin A toxicity, initially presenting with irritability, vomiting, loss of appetite and skin changes, has been reported especially in children. In chronic hypervitaminosis, increased intracranial pressure and cirrhosis like liver syndrome are observed.

Resolution of the symptoms usually occurs upon withdrawal of the vitamin. A daily dose in excess of 150,000 i.u. or a single intake of more than 1,500,000 i.u. often leads to toxicity.

*Vitamin D*

Vitamin D can also lead to overt toxicity. Calcium
metabolism is disturbed and calcification of soft tissue including the lungs and kidneys results. Cerebral and cardiovascular damage is also observed and infants appear particularly vulnerable. In infants showing increased sensitivity to the vitamin, hypercalcemia is a serious risk. Adult intakes of more than 50,000 units may lead to poisoning. Symptoms and signs of hypercalcemia include anorexia, nausea, vomiting, constipation, abdominal pain, muscle weakness, thirst, polyuria, drowsiness, confusion, nephrocalcinosis, renal calculi and in severe cases, cardiac arrhythmias, cardiac arrest and coma. The above effects are generally only likely to occur if doses in excess of those recommended are taken and/or for prolonged periods.

**Warnings and Precautions**

There are serious risks of developing hypercalcemia when calcium salts or thiazides are coadministered. Serum calcium, phosphate, alkaline phosphatase, liver function tests and magnesium should be monitored when indicated. Absorption of vitamin A is reduced in cystic fibrosis, hepatic diseases, pancreatic dysfunction and in patients with intestinal infections. The use of vitamin A in renal diseases requires extreme caution.

**Pregnancy and Lactation**

Animal reproduction studies in several species have shown that when maternal intake is excessive, vitamin A has been associated with major fetal abnormalities. Vitamin A is found in breast milk of lactating mothers and there is therefore a theoretical risk of neonatal toxicity. In humans, idiopathic hypercalcemia is associated with supravalvular aortic stenosis and this lesion has also been reported when large doses of vitamin D are given to pregnant rabbits. Vitamin D may induce maternal neonatal hypocalcemic tetany. In nursing mothers, maternal hypercalcemia may result in neonatal hypercalcemia as calcium and Vitamin D are excreted in breast milk.

Doses of vitamin A and D in excess of those recommended should be avoided during pregnancy and lactation.

**Effects on Ability to Drive and Operate Machinery**

None.

**Overdosage**

Should overdose occur, symptoms and signs of toxicity are as described under Side Effects.

**Incompatibilities**

See Drug interactions.

**Drug Interactions**

Contraceptive pills raise plasma levels of Vitamin A. Agents such as bile acid resins, e.g. cholestyramine and colesterlip impair the absorption of fats including the vitamins A and D. As both vitamin D and thiazide diuretics increase the plasma concentration of calcium, co-administration of these agents may result in hypercalcemia. Hypercalcemia, which may result from administration of vitamin D enhances the toxic effects of cardiac glycosides. Vitamin D also enhances magnesium absorption. The effects of vitamin D on the intestinal absorption of calcium and bone resorption may be reduced by concomitant administration of barbiturates or anticonvulsants. Liquid paraffin used as a laxative, and other agents affecting motility of the gastrointestinal tract may interfere with the absorption of fatsoluble vitamins. Pyridoxine antagonises the effects of L-dopa unless a dopa-decarboxylase inhibitor is given concurrently.

**Dosage and Administration**

Adults, elderly and children: 1 capsule daily.

**Packaging**

c: 25, 100.

**Storage**

Keep all medicines out of the sight and reach of children.