Brand Name: Gervit

Generic Name: L-Glutamic Acid + Multi Minerals + Multivitamins

Dosage Forms: Oral Tablets

Composition & Strength of Gervit:

- **L-Glutamic Acid**: 50 mg
- **Minerals**: The combination may include several minerals, such as Magnesium 10 mg , Zinc 5 mg , Manganese 1.5 mg, Copper 0.7 mg, Molybdenum 20 mcg and Selenium 15 mcg.
- **Vitamins**: The combination may include vitamins such as Vitamin A 450 mcg , Vit C 30 mg, Vit D 300 IU, Vit E 6.5 mg ,B-complex (B1 0.8 mg, B2 0.9 mg, B6 1.5 mg, B12 0.12 mg), Folic Acid 150 mcg, Biotin 10 mcg ,Pantothenic Acid 3mg, Niacin 10 mg

L-Glutamic Acid in Gervit (commonly referred to as Glutamate when it is in its ionized form) is an amino acid that plays several key roles in the body, particularly in the brain and central nervous system. It is the most abundant excitatory neurotransmitter in the brain and has a significant role in neurotransmission, neuroplasticity, and metabolism. Here's a breakdown of its mechanism of action (MOA):

Mechanism of Action of L-Glutamic Acid (Glutamate):

1. **Excitatory Neurotransmission:**
    - **Glutamate acts primarily as an excitatory neurotransmitter in the central nervous system (CNS). It binds to glutamate receptors on neurons, leading to their activation and the propagation of excitatory signals.**
    - **There are three main types of glutamate receptors, each contributing to different aspects of neuronal signaling:**
        - **Ionotropic receptors: These are ligand-gated ion channels that include:**
            - **NMDA receptors (N-Methyl-D-Aspartate receptors)**
            - **AMPA receptors (Alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptors)**
            - **Kainate receptors (Kainic acid receptors)**
        - **Metabotropic receptors: These are G-protein coupled receptors (GPCRs) that modulate intracellular signaling pathways.**
2. **NMDA Receptor (N-Methyl-D-Aspartate) Activation:**
    - **NMDA receptors are a subtype of glutamate receptors that play a key role in synaptic plasticity, learning, and memory.**
    - **When glutamate binds to the NMDA receptor, it allows calcium ions (Ca^{2+}) to enter the neuron. The influx of calcium leads to a variety of effects, including:**
        - **Long-term potentiation (LTP): This process strengthens synaptic connections, which is critical for memory formation and learning.**

        - **Synaptic plasticity: Changes in the strength of synaptic connections contribute to adaptive changes in the brain, such as in response to experience and learning.**
    - **NMDA receptor activation also requires depolarization of the postsynaptic membrane to remove a magnesium ion (Mg^{2+}) that blocks the channel, allowing calcium and sodium to flow in.**
3. **AMPA and Kainate Receptor Activation:**
    - **AMPA receptors mediate fast excitatory transmission and, when activated by glutamate, lead to the influx of sodium (Na^{+}) ions into the neuron, resulting in depolarization of the postsynaptic membrane.**
    - **Kainate receptors also contribute to excitatory signaling but play a lesser role compared to NMDA and AMPA receptors.**
4. **Metabotropic Glutamate Receptors (mGluRs):**
    - **These are G-protein coupled receptors that modulate intracellular signaling pathways, often influencing synaptic plasticity, neuronal excitability, and neurotransmitter release.**
    - **mGluRs are involved in modulating synaptic transmission, neuroprotection, and regulation of mood. They can either enhance or inhibit glutamate release, depending on the receptor subtype.**
5. **Glutamate and Learning/Memory:**
    - **Glutamate is heavily involved in synaptic plasticity mechanisms, particularly long-term potentiation (LTP), which is a key process in learning and memory formation.**
    - **The NMDA receptor plays a central role in initiating LTP in regions like the hippocampus, which is important for memory encoding.**
6. **Neurotoxicity (Excitotoxicity):**
    - **While glutamate is crucial for normal brain function, excessive glutamate activation, often resulting from overstimulation of glutamate receptors, can lead to excitotoxicity, a process where neurons are damaged due to excessive calcium influx.**
    - **Excitotoxicity is implicated in a variety of neurodegenerative disorders, such as Alzheimer's disease, Parkinson's disease, stroke, and traumatic brain injury.**
7. **Glutamate as a Precursor in Metabolism:**
    - **Outside the brain, glutamic acid is important as a precursor for the synthesis of other amino acids like glutamine and is involved in protein synthesis.**
    - **It also participates in the urea cycle and ammonia detoxification in the liver, converting into glutamine to help eliminate excess nitrogen.**

Summary of MOA:

- **L-Glutamic Acid (Glutamate) acts as the primary excitatory neurotransmitter in the brain by binding to various glutamate receptors, including NMDA, AMPA, and kainate receptors, leading to depolarization of neurons and the propagation of excitatory signals.**
- **It plays a critical role in learning, memory, and synaptic plasticity, particularly through NMDA receptor activation.**
- **While glutamate is essential for normal brain function, excessive activation can lead to neurotoxicity (excitotoxicity), contributing to various neurodegenerative diseases.**

In conclusion, L-Glutamic Acid is crucial for proper brain function but requires careful regulation to prevent harmful effects due to overactivation of glutamate receptors.

1. Indications of Gervit

- **Nutritional Supplementation**: Used for the supplementation of essential vitamins, minerals, and amino acids to promote overall health and wellness.
- **L-Glutamic Acid Deficiency**: Often used in patients requiring additional glutamic acid, which plays a role in brain function, metabolism, and protein synthesis.
- **Vitamin and Mineral Deficiencies**: Used to address deficiencies or insufficiencies of essential vitamins and minerals, especially in cases of poor diet, malabsorption, or specific medical conditions.
- **Support for General Health**: May be prescribed for maintaining healthy energy levels, supporting immune function, improving skin health, and overall well-being.
- **Recovery**: May be used in recovery from illness, surgery, or intense physical activity where there is a higher demand for vitamins and minerals.

2. Dosage and Administration of Gervit

- **Standard Dosage**:
    - **Adults**: Typically, **1 tablet or capsule** once or twice a day, or as prescribed by the healthcare provider.
    - **Children**: Dosage is based on age and weight; pediatric doses should be determined by a pediatrician.
- **Administration**:
    - Take with a glass of water, preferably with food to improve absorption and reduce potential gastrointestinal irritation.
    - For liquid formulations, the recommended dosage will be specified on the product packaging.

3. Contraindications

- **Hypersensitivity**: Contraindicated in patients with a known allergy to any of the components, including L-Glutamic Acid, minerals, or vitamins.
- **Hypervitaminosis**: Contraindicated in patients with an excess of certain vitamins, such as Vitamin A, D, or Iron, due to the risk of toxicity.

- **Severe Renal or Hepatic Dysfunction**: Use with caution or avoid in patients with severe kidney or liver disease, especially if the formulation contains minerals like magnesium or iron.
- **Iron Overload**: Contraindicated in individuals with conditions like **hemochromatosis** (iron overload disorders) due to the risk of exacerbating iron buildup.

4. Warnings and Precautions

- **Excessive Dosage**: Overuse of vitamins and minerals can cause toxicity. Regular monitoring may be required in long-term use.
- **Vitamin A Toxicity**: High doses of Vitamin A may lead to toxicity, causing symptoms like nausea, dizziness, and liver damage.
- **Iron Toxicity**: Excess iron can lead to organ damage, especially in children; keep supplements out of reach of children.
- **Glutamic Acid Sensitivity**: Some individuals may experience sensitivity to L-Glutamic acid, leading to headaches or gastrointestinal discomfort.
- **Pregnancy and Lactation**: This combination should be used cautiously during pregnancy and breastfeeding. It is essential to follow the guidance of a healthcare provider to avoid excessive intake of certain vitamins or minerals.
- **Renal Impairment**: Caution is needed in patients with kidney disease, particularly if the supplement contains significant levels of certain minerals like potassium, magnesium, or calcium, which may affect renal function.

5. Adverse Reactions

- **Common Side Effects**:
    - Mild gastrointestinal discomfort (nausea, bloating, or diarrhea)
    - Headaches (particularly related to Vitamin A or B12)
    - Skin rashes or allergic reactions
- **Serious Side Effects**:
    - **Hypercalcemia** (high calcium levels) from excessive calcium intake
    - **Iron Overload**: Risk of iron toxicity, especially in those with underlying conditions like hemochromatosis
    - **Kidney Stones**: Potential risk with excessive magnesium or calcium intake over time.

6. Drug Interactions

- **Iron and Calcium**: These minerals may interfere with the absorption of certain other medications, such as antibiotics (e.g., tetracycline, doxycycline) and thyroid medications (levothyroxine).
- **Magnesium and Potassium**: Caution is needed when combined with other medications that affect electrolyte balance or kidney function (e.g., diuretics or ACE inhibitors).

- **Vitamin A**: High doses of Vitamin A should not be taken with other vitamin A supplements or certain medications like isotretinoin, which also contains high amounts of Vitamin A, to avoid toxicity.
- **Vitamin K and Anticoagulants**: Vitamin K can interfere with blood-thinning medications (e.g., warfarin), affecting clotting mechanisms.

7. Use in Specific Populations

- **Pregnancy**: Generally considered safe when taken within recommended dosages. However, high doses of certain vitamins (e.g., Vitamin A) may be harmful during pregnancy, so consult a healthcare provider before use.
- **Lactation**: Multivitamin and mineral combinations can be used during breastfeeding, but the dosage should be monitored to avoid excessive intake.
- **Elderly**: In elderly individuals, the requirement for certain vitamins and minerals, such as Vitamin D, B12, and calcium, may be higher. The dosage should be adjusted based on individual health needs.
- **Children**: Pediatric doses should be determined by a pediatrician, especially for children under 12 years old.

8. Overdose

- **Symptoms of Overdose**:
    - Symptoms may vary depending on the specific vitamin or mineral but may include nausea, vomiting, diarrhea, dizziness, or lethargy.
    - **Iron Overdose**: Can cause abdominal pain, vomiting, and more severe systemic symptoms like organ damage.
    - **Vitamin A Toxicity**: May cause dizziness, headaches, dry skin, and liver damage.
- **Management**: In case of overdose, immediate medical attention is required. For iron overdose, chelation therapy may be required.

9. Pharmacology

- **L-Glutamic Acid**: An amino acid that plays a crucial role in protein synthesis, metabolism, and as a neurotransmitter in the brain. It helps in cognitive function and maintaining proper cellular functions.
- **Minerals**: Essential for a variety of bodily functions, including bone health (Calcium), nerve and muscle function (Magnesium, Potassium), and red blood cell production (Iron).
- **Vitamins**: Vitamin A supports immune function and vision, Vitamin C is important for collagen synthesis, Vitamin D helps with calcium absorption, and B vitamins (B1, B2, B6, B12) aid in energy metabolism.

10. Storage

- Store in a cool, dry place (15°C to 30°C).
- Keep tightly closed and out of reach of children to prevent accidental ingestion.

- Liquid formulations should be stored according to the manufacturer's recommendations (e.g., refrigerated or at room temperature).

11.Packaging

- Each Alu-Alu strip of Gervit contains 10 tablets.
- Each box of Gervit contains 10 strips.

Note: This summary provides general prescribing information.