Cardio Mag 2.0

Your Magnesium for a Healthy Heart

- High dose of orotic acid combined with magnesium for pure magnesium orotate
- Clinically shown to protect and heal the heart in cardiac patients
- Increases heart energy production

Details
Magnesium is a critical mineral, especially for cardiovascular health, and can offset inflammation, endothelial dysfunction, poor blood flow, atherosclerosis and high blood pressure. Furthermore, magnesium helps to regulate heart contractions and plays a central role in energy metabolism.

Cardio Mag 2.0 provides magnesium orotate, a form of magnesium that is well absorbed and has been studied specifically for heart health. In addition to the magnesium, the orotic acid (orotate) has benefits of its own. It can penetrate cell membranes, enabling the effective delivery of the magnesium to the innermost layers of the cell. Orotic acid also increases the formation of RNA and DNA, which can help repair damage to heart cells, improve stress tolerance and therefore improve function. The combination of magnesium and orotic acid has been shown in clinical trials to reduce the frequency of abnormal heartbeats, improve heart failure, reduce symptoms of angina, and enhance exercise performance.

AOR’s Cardio Mag 2.0 is designed to support heart health and to support normal blood pressure. It is a fully reacted, 100% pure magnesium orotate supplement. Cardio Mag 2.0 is a heart-specific form of magnesium that is clinically proven to improve the quality of life of those living with heart ailments and may help improve exercise capacity in both heart patients and athletes.

Label Info
Discussion
Cardio Mag 2.0 is a true, fully-reacted magnesium orotate supplement, unlike most others. Magnesium and orotic acid have complementary effects in the body; they help to maintain normal glycogen and ATP levels (energy production), normal protein synthesis, and muscle contractions. Cardio Mag 2.0 supports cardiac function under stress.

Product Variation

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Supplements Facts

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<th>Serving Size: 1 Capsule</th>
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<td>Magnesium orotate</td>
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<td>Elemental Magnesium</td>
<td>50 mg</td>
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Non-medical ingredients:
sodium stearyl fumarate. Capsule: hypromellose.

Guarantees

AOR™ guarantees that all ingredients have been declared on the label. Contains no wheat, gluten, corn, nuts, peanuts, sesame seeds, sulphites, mustard, soy, dairy, eggs, fish, shellfish or any animal byproduct.

Adult Dosage

Take 1 capsule four times daily with food, or as directed by a qualified health care practitioner.

Cautions

None known.

Source

Pharmaceutical synthesis

Main Application

Cardiovascular health

Healthy blood pressure

Sports nutrition

Disclaimer

The information and product descriptions appearing on this website are for information purposes only, and are not intended to provide or replace medical advice to individuals from a qualified health care professional. Consult with your physician if you have any health concerns, and before initiating any
new diet, exercise, supplement, or other lifestyle changes.

Research

Background

True Magnesium Orotate for Cardiovascular Health

Ask health-conscious people about the mineral most important to their heart health, and most will hit on magnesium right away. But few people look beyond the amount of elemental magnesium in their supplements to consider the importance of the other half of their magnesium supplement – the chelating amino acid or anion to which it’s bound. For instance, the widely-used magnesium oxide has “extremely low” bioavailability (22.8%), making it more likely to cause diarrhea; and on top of this embarrassing side-effect, magnesium oxide is an antacid, which can impair digestion and nutrient absorption. But there’s more to the effects of a magnesium supplement than its bioavailability. Because the “other half” of one magnesium supplement is extensively documented to have profound effects on cardiovascular health. That supplement is true, fully-reacted Magnesium Orotate.

Magnesium Orotate is magnesium bound to orotic acid, a key intermediate in the biosynthesis of pyrimidine nucleotides (a building block of the “letters” of your DNA code, and of RNA, the messenger that delivers the instructions from the DNA to the cellular machinery that assembles cellular proteins based on DNA’s commands). Although little known and underappreciated, decades of research and clinical trials have documented the powerful benefits of Magnesium Orotate to the weakened heart.

Russian Research

The use of orotic acid and its mineral forms as metabolic therapy for cardiovascular patients began in the early 1960s in the former Soviet Union, where it was primarily used to provide support to heart patients, particularly in cases of cardiomyopathy. Animal models had shown that heart problems increase the demand for RNA for the biosynthesis of proteins needed to repair the heart. So Soviet cardiologists reasoned that, since orotate is needed for biosynthesis of RNA precursors, supplemental orotate might speed the recovery of heart muscle function.

Animal models provided early evidence to support the Russian scientists’ expectations, showing that supplemental orotate increases cardiac glycogen, protein synthesis, and ATP levels, and improves cardiac contractile function following damage to the heart, without interfering with normal baseline function in healthy hearts. This evidence was enough to get Russian cardiologists going on clinical trials of mineral orotates in the 1960s, which clearly showed the benefits of orotate supplementation.

Magnesium Orotate: the Synergistic Cardiovascular Supplement

In the early days, research was conducted on a variety of mineral orotates, such as calcium orotate and potassium orotate. It was only later that researchers picked up on the unique advantage of combining orotate with magnesium to create one unique cardiovascular health supplement: Magnesium Orotate. This combination not only takes advantage of magnesium as a heart-health supplement in its own right: the magnesium in Magnesium Orotate is a key cofactor for the very enzyme that uses orotate to biosynthesize the RNA precursors (pyrimidine nucleotides) through which orotate strengthens and restores heart cells under stress.
A Remarkable Safety Record

Magnesium Orotate has been documented to be an extremely safe supplement. A 1998 review of studies on Magnesium Orotate states that “No adverse effects arising from [orotic acid] administration in humans have been reported”. Even diarrhea – the most commonly-reported side effect of magnesium supplements – appears to be extremely rare in Magnesium Orotate users: there has only been one trial of Magnesium Orotate reporting any diarrhea, and this was unusual and did not lead to anyone quitting their Magnesium Orotate use.

While animal experiments once suggested that high-dose orotate supplements might harm the liver, this turned out to be a quirk of the unusual metabolism of the rat, which doesn’t apply in other species. Quite the contrary, in fact: orotate and its salts have been used as a treatment for a variety of liver disorders in humans.

Probably the best evidence of the safety of high-dose orotate supplements are the many trials in which they have been safely used without side effects in vulnerable population groups, such as children with heart, liver and bile duct disorders, as well as pregnant women and even infants with jaundice.

Not Just Another Magnesium

With all of the decades of research backing the benefits of Magnesium Orotate, why is it not more widely available? In part, it’s because the research is so new to the West. Many don’t know about the specific benefits of orotic acid that are so critical to the actions of a Magnesium Orotate supplement. Some people think that the heart-health benefits of a magnesium supplement come entirely from the magnesium itself, and that Magnesium Orotate is “just another magnesium supplement” on a shelf full of other cheaper and lower-pill-count alternatives.

Also, Magnesium Orotate is a bulky supplement. The orotic acid in Magnesium Orotate is a big molecule; when magnesium is bound to it, the final complex is only about 6.5% elemental magnesium by weight. But to compare Magnesium Orotate to other magnesium supplements on a simple milligram-for-milligram basis is misleading, because Magnesium Orotate is not just a magnesium supplement: its cardiovascular benefit derives from the orotic acid as much as it does from the magnesium itself. And you don’t need a whole RDA’s worth of elemental magnesium to enjoy its effects: the many clinical trials on Magnesium Orotate clearly document that the cardiovascular benefits from Magnesium Orotate are achieved at doses of 200 mg of elemental magnesium or less.

A True Chelate

Once you know about the superior cardiovascular benefits of Magnesium Orotate, however, you still have the problem of locating the real thing. The fact is that the great majority of the “Magnesium Orotate” on the market is not pure, fully-reacted Magnesium Orotate, but a “blend” or “complex,” mostly made up of magnesium oxide. These products look attractive, because they claim to provide this desirable form of the mineral, yet are cheap and contain a high amount of elemental magnesium per tablet – but that’s only because the Magnesium Orotate in these supplements is “cut” with cheaper, denser forms of the mineral.

To be sure that you’re getting the real thing, compare the amount of elemental magnesium listed on
the label with the amount of orotic acid. True, fully-reacted Magnesium Orotate contains nearly 15 times as much orotic acid as magnesium by weight. If the label isn’t clear on this point, you can’t be sure of what you’re getting. Then, be prepared for the small added cost of genuine Magnesium Orotate, and the need to fit an extra capsule or two into your daily regimen. These minor inconveniences will pay major dividends in the health of your heart.

Research

Heart Regulation

Gaita and coworkers performed a randomized, controlled trial in 32 heart patients who had recently undergone coronary artery bypass grafting (CABG) surgery. Within two days of surgery, each participant received either a 2000 mg Magnesium Orotate supplement or a placebo dummy pill as an add-on to their standard heart medication. Eight weeks later, Magnesium Orotate users experienced functional improvements on a wide range of heart function parameters in comparison with those taking the placebo, including exercise times, angina-free walking distance, and VO2max; most notably, they enjoyed a 63% lower risk of suffering extra systoles (“extra” heartbeats, felt as “missed” beats or “flip-flops” in the chest).

Mitral Valve Prolapse

A second controlled trial compared the effects of 3000 mg Magnesium Orotate with standard control treatment in 84 people suffering with mitral valve prolapse. The results: a “6-month therapy with [Magnesium Orotate] completely or partially reduced the symptoms in more than half the patients. Positive changes were registered primarily in clinicofunctional manifestations.”

Heart Disease and Left Ventricular Dysfunction

In a third study, fourteen heart disease patients with left ventricular dysfunction who were undergoing an exercise therapy program, took either Magnesium Orotate (3000 mg) or placebo pills as an add-on to their existing medications for four weeks. Compared with the placebo group, users of Magnesium Orotate enjoyed greater improvements in exercise times and in the emptying and filling of the left ventricle.

Cardiac Surgery

In the most recent study, Magnesium Orotate was used as a central part of a “Metabolic Physical and Mental (MPM) Program,” a whole-lifestyle intervention involving an exercise (Physical) component, stress reduction (Mental), and Metabolic supplement use (1200 mg Magnesium Orotate along with coenzyme Q10, lipoic acid, and omega-3 fatty acids). In this historically-controlled trial, the MPM program was compared to previous cases given standard care in 11 elderly people scheduled for cardiac surgery. Even in the two week period between starting the trial and going under the knife, Magnesium Orotate users undergoing the MPM improved their overall quality of life. And one month after surgery the benefits became striking. As part of the MPM, using Magnesium Orotate led to a full 50% jump in physical quality of life, while mental quality of life also got 24% better. By contrast, scores on all of these parameters had gotten worse during the same periods in the historical control group. Meanwhile, malondialdehyde (a marker of lipid peroxidation and thus of free radical stress)
plunged 45%.

**Angina, Child Blood Pressure Regulation and Blood Vessel Health**

Other clinical trials have documented the effectiveness of Magnesium Orotate supplements in delivering improved quality of life in elderly patients with stable angina; in supporting exercise and a salt-restricted diet to reduce blood pressure, eliminate heart palpitations, and improve sleep quality in child heart patients; and in improving the flexibility of blood vessels and reducing anginal pains in patients with blood vessel disorders.

**Triathletes**

In a recent double-blind, randomized controlled trial, Magnesium Orotate supplementation has also been found to simultaneously improve physical performance, and reduce some of the punishing negative impacts of extreme physical exercise, in triathletes.

**Market Trends**

Many supplement with magnesium alone in an effort to improve their health. Those wishing to improve their heart function and overall health would benefit not only from a magnesium supplement but from a true, fully-chelated magnesium orotate complex.

**AOR Advantage**

Cardio Mag 2.0 is a fully reacted and pure form of magnesium orotate which provides significantly higher levels of orotic acid than many other supplements on the market.

**References**


Abstract

Pre-operative preparation for cardiac surgery utilising a combination of metabolic, physical and mental therapy.


Cardiac surgery represents major metabolic, physical and mental stresses associated with an increased production of reactive oxygen species. These stresses may hamper post-operative recovery, increasing hospitalisation times and operative mortality. We conducted a quality assurance and feasibility study to evaluate and monitor the safety and efficacy of a new program of combined pre-operative metabolic (enhanced antioxidant), physical and mental therapy to counter these stresses prior to cardiac surgery. METHODS: Sixteen cardiac surgery patients received metabolic therapy consisting of the antioxidants coenzyme Q(10) (CoQ(10)) (300 mg) and alpha-lipoic acid (300 mg), combined with magnesium orotate (1200 mg), and omega-3 fatty acids (3g) given daily for a mean 36 +/- 7 days up until the day of operation. Patients also received a regimen of physical therapy incorporating non-exhaustive, light exercise and stretching techniques. Mental therapy in the form of stress reduction, relaxation and music was also provided. Blood levels of CoQ(10) and malondialdehyde (MDA) were measured and a quality of life (QoL) questionnaire (SF-36) was administered before, after the program and 1 month after surgery. A patient satisfaction survey was conducted at six weeks post-operatively. RESULTS: During the pre-operative period, treated patients (n=16) showed significant improvements in QoL composite scores, physical (33.5 +/- 4.1 to 41.0 +/- 4.5, p=0.005) and mental (44.3 +/- 4.5 to 54.1 +/- 5.3, p=0.006). CoQ(10) levels increased from 725.6 +/- 96.1 nmol/l to 3019.9 +/- 546.4 nmol/l (p=0.006), MDA levels decreased from 2.2 +/- 0.9 microM to 1.4 +/- 0.7 microM (p=0.013) and systolic blood pressure decreased from 140 +/- 4.0 mmHg to 132 +/- 3.0 mmHg (p=0.002). One month after surgery the treated group (n=14) demonstrated significant improvements from pre-operative baseline in QoL composite scores, physical (38.9 +/- 4.0 to 57.9 +/- 5.4, p=0.01) and mental (50.3 +/- 5.6 to 69.3 +/- 4.8, p=0.03) compared to a previously reported similar group of cardiac surgery patients (n=74) whose physical and mental scores decreased from 43.0 to 42.8 (p=0.05) and 53.8 to 49.8, respectively (p=0.05). CONCLUSION: These preliminary results suggest that a program of combined metabolic, physical and mental preparation before cardiac surgery is safe, feasible and may improve quality of life, lower systolic blood pressure, reduce levels of oxidative stress and thus has the potential to enhance post-operative recovery.

Clinical value of the use of magnesium orotate in adolescents with syndrome of cardiac connective tissue dysplasia
According to results of clinical and instrumental investigation magnesium orotate (50 mg/day during first week and 25 mg/day thereafter) was found to be effective therapy of children with syndrome of cardiac connective tissue dysplasia (mainly with mitral valve prolapse and anomalous chordae tendineae).

Response of the senescent heart to stress: clinical therapeutic strategies and quest for mitochondrial predictors of biological age.


The aging heart has an impaired response to many kinds of stress. In clinical practice, there is a need for senescence-specific therapies to protect against stress and for biochemical markers of senescence to identify those patients most in need of therapy. In isolated rat hearts, in human tissues, and in a clinical trial, we have shown previously that coenzyme Q(10) has the ability to protect the heart against stress especially in senescence. We recently have devised a regimen of therapy to protect the senescent heart against stress, combining metabolic therapy (coenzyme Q(10), alpha lipoic acid, magnesium orotate, and omega 3 polyunsaturated fatty acids) with physical exercise and mental stress reduction. The preliminary results of this program are promising. In an endeavor to predict the likely response of individual senescent hearts to stress, we correlated the tissue load of mitochondrial DNA deletions and total cellular mitochondrial DNA copy number in human cardiac tissue with recovery of the same tissue from ischemia/reperfusion stress. We found that these mitochondrial markers actually were less predictive of impaired response to stress than age alone. We conclude that the aging heart has a diminished capacity to recover from stress that is not readily predictable by cardiac content of intact mitochondrial DNA and that this recovery can be improved by metabolic therapy combined with physical exercise and mental stress reduction.

Orotic acid as a metabolic agent.


Stepura OB, Tomaeva FE, Zvereva TV.

The paper reviews clinical and experimental studies into the mechanisms of action of orotic acid (OA). OA has been shown to take an active participation in metabolic processes in the body. As a pyrimidine precursor, it plays a key role in the biosynthesis of nucleic acids and protein, regulates water-salt exchange, by increasing diuresis and reducing the volume of extracellular fluid. OA is also a cellular fixative of magnesium by producing pronounced antiarrhythmic, vasodulator, and cardioprotective effects. OA has ascertained to stimulate erythro- and leukopoiesis. The involvement of OA in metabolic processes explains its cardio- and neuroprotective effects. By enhancing the
resistance of myocytes to ischemia, OA favourably affects the clinical course of myocardial infarction and on manifestations of heart failure. OA has been noted to have an angioprotective action and to play an important role in the energy provision of the hypertrophic myocardium, by increasing its contractility. The ability to enhance the functional reserves of the heart adapted to higher exercises accounts for its use in sportive medicine. When there are emergency emotional and vestibular stimuli, OA drugs show an anti-stressor action and are effective in treating patients with borderline nervous and mental disorders. Whether OA can be used to treat gastrointestinal diseases is to be clarified.

**Effects of orotic acid on ischaemic/reperfused myocardial function and glycogen content in isolated working rat hearts.**


**Ferdinandy P, Fazekas T, Kadar E.**

The present study was carried out to investigate the effect of orotic acid on ischaemic/reperfused myocardial function and cardiac glycogen content in isolated working rat hearts. In a preliminary series of studies, hearts isolated from male Wistar rats (300-350 g) were perfused with oxygenated Krebs-Henseleit buffer containing cumulative concentrations of orotic acid from 0.01 to 10.00 mg l-1. In the concentration range of 0.01-0.10 mg l-1, orotic acid significantly improved left ventricular function. Therefore, in the second series of studies, rats were treated intravenously with 0.01 mg kg-1 orotic acid for 4 days. Hearts were then isolated and subjected to 30 min of global no-flow ischaemia followed by 10 min of reperfusion. Orotic acid treatment significantly improved post-ischaemic myocardial function and increased pre-ischaemic and post-ischaemic glycogen content of the heart. We conclude that orotic acid improves ischaemic/reperfused cardiac performance and this effect may be based on the elevation of myocardial glycogen content.

**Effects of magnesium orotate on exercise tolerance in patients with heart disease.**


**Geiss KR, Stergiou N, Jester, Neuenfeld HU, Jester HG.**

In a pilot study at 14 patients with heart disease and left-ventricular dysfunction (left ventricular enddiastolic volume [LVEDV] > or = 100 ml), who actively participated in an ambulatory cardiac sports group, left ventricular endsystolic volume (LVESV), LVEDV and duration of exercise were analyzed by echocardiographic and ergometric tests. An initial workup was followed by a 4 week double blind treatment phase, in which magnesium orotate 3 x 1 g or placebo was given additionally to medication taken prior to the study. At the end of this phase a concluding workup was performed. Magnesium orotate decreased significantly (p = 0.016) LVESV, increased significantly (p = 0.035) EF, decreased in tendency (p = 0.054) LVEDV and increased significantly (p = 0.011) exercise duration. The study gives references to favourable effects of oral magnesium orotate to left ventricular function and exercise tolerance in patients with heart disease.
On the significance of magnesium in extreme physical stress.


Golf SW, Bender S, Gruttner J.

In a double-blind randomized study, 23 competitive triathletes competing in an event consisting of a 500-meter swim, a 20-km bicycle race, and a 5-km run were studied after 4-week supplementation with placebo or 17 mmol/d Mg orotate. The tests were carried out without a break. Blood was collected before and after the test, and between the different events for assaying energy stress and membrane metabolism. Swimming, cycling, and running times decreased in the Mg-orotate group compared with the controls. Serum glucose concentration increased 87% during the test in the control group and 118% in the Mg-orotate group, while serum insulin increased 39% in the controls and decreased 65% in the Mg-orotate group. Venous O2 partial pressure increased 126% during the test in the controls and increased 208% in the Mg-orotate group. Venous CO2 partial pressure after the bicycle race decreased 66% (significantly) in the Mg-orotate group compared with 74% in the controls. Blood proton concentration decreased to 90% in the Mg-orotate group (significantly) compared with 98% in the controls. Blood leukocyte count increased from 5.92/nL to 11.0/nL in the controls and from 5.81/nL to 9.10/nL in the Mg-orotate group, a significant difference. Serum cortisol was lower in the Mg-orotate group before and after the test compared with the controls. CK catalytic concentration after the test was elevated 140% in the controls compared with 122% Mg-orotate group. The stress-induced modifications of energy and hormone metabolism described in this study indicate altered glucose utilization after Mg-Orotate supplementation and a reduced stress response without affecting competitive potential.

Capillarographic criteria on the effect of magnesium orotate, EPL substances and clofibrate on the elasticity of blood vessels.


Nieper HA.

115 Patients suffering from diseased blood vessels or inflammatory changes in vessel behavior were treated for fifteen months with either magnesium orotate, EPL substances (essential phospholipids) or clofibrate. Vessel elasticity was checked at intervals of six weeks by means of light-electronic capillarography. Magnesium orotate resulted in an excellent or at least satisfactory normalization of vessel elasticity in all 64 cases. EPL substances led to an improvement of elasticity in about two-thirds of 34 cases. Clofibrate resulted in an improvement for 5 out of 28 patients, which cannot be considered a statistically positive result.