INTERNATIONAL IV NUTRITIONAL THERAPY GLOBAL PHYSICIAN EDUCATION

Alpha Lipoic Acid

Alpha Lipoic Acid

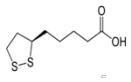
- AKA Thioctic Acid
- Naturally occurring compound that is synthesized in small amounts by living organisms
- Plants, animals, humans.

What is ALA and What are its functions

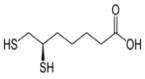
- **ALA is the oxidized form of dihydrolipoic acid (DHLA)**
  - **scavenges hydroxyl radicals, singlet oxygen and hypochlorous acid.**
  - **Found in low concentrations in all muscles and internal organs**
  - **potentially chelates heavy metals**
  - **regenerates other antioxidants through donations of a molecule.**

Shown it its oxidized and reduced state through its 2 thiol(sulfur) groups.

Alpha LIPOIC ACID



DIHYDROLIPOIC ACID



•Functions as a potent antioxidant and cofactor for various enzymes (pyruvate dehydrogenase and alpha-ketoglutarate dehydrogenase) in energy production.

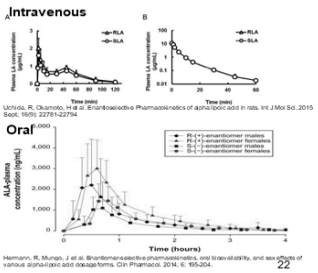
- **Powerful free radical scavenger**
- **A fat soluble and water soluble antioxidant**
  - **improves oxygenation in all cells.**
- **a cofactor in the krebs cycle.**
- **A fatty acid containing two sulfur atoms.**

The preventative and therapeutic role.

- **Increases Glutathione levels in RBC's and lymphocytes**
- **Crosses the blood brain barrier**
  - **Through cysteine utilization,**
- **Increases cytotoxic effect of Vit C**
- **Mobilizes (chelates) : Mercury, Arsenic, and cadmium**

- **Improves Peripheral neuropathy, diabetics**
- **PVD**
- **Glaucoma**
- **MS (myelin sheath protection)**
- **Hepatitis C**
- **HIV**
- **Prevents radiation damage (nuclear),**
- **Antidote for poisonous mushrooms (amanita)**

- R vs S: NO difference in intravenous metabolism and blood plasma concentrations.
- Oral: significantly increased concentrations are detected in the plasma when R form is used



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Effect of α-lipoic acid on symptoms and quality of life in patients with painful diabetic neuropathy

Evangelos Agathos, Anastasios Tentolouris, Ioanna Eleftheriadou, Panagiota Katsaouni, Ioannis Nemtzas, Alexandra Petrou, Christina Papanikolaou and Nikolaos Tentolouris

Abstract

Objective: To examine the effect of α-lipoic acid on neuropathic symptoms in patients with diabetic neuropathy (DN).

Methods: Patients with painful DN were treated with 600 mg/day α-lipoic acid, orally, for 40 days. Neuropathy Symptom Score (NSS), Subjective Peripheral Neuropathy Screen Questionnaire (SPNSQ) and douleur neuropathique (DN)4 questionnaire scores were assessed at baseline and day 40. Quality-of-life treatment effects were assessed by Brief Pain Inventory (BPI), Neuropathic Pain Symptom Inventory (NPSI) and Sheehan Disability Scale (SDS). Changes in body weight, arterial blood pressure, fasting serum glucose and lipids were also assessed.

Results: Out of 72 patients included, significant reductions in neuropathic symptoms were shown by reduced NSS, SPNSQ and DN4 scores at day 40 versus baseline. BPI, NPSI, and SDS in terms of work disability, social life disability, and family life disability scores were also significantly reduced. Moreover, 50% of patients rated their health condition as 'very much better' or 'much better' following α-lipoic acid administration. Fasting triglyceride levels were reduced,

OLD Formulations IV ALA

- 2000mg of the OLD formulation has been infused for DM peripheral neuropathy with favorable results. Newer formulations appear to be more potent so this dose may not be practical.
- Known to be metabolized in 2-4 hours

Med Klin (Munich). 1999 Oct 15;94 Suppl 3:84-9.

A conservative triple antioxidant approach to the treatment of hepatitis C. Combination of alpha lipoic acid (thioctic acid), silymarin, and selenium: three case histories.

Berkson BM[1].

Author information

Abstract

BACKGROUND: There has been an increase in the number of adults seeking liver transplantation for hepatitis C in the last few years and the count is going up rapidly. There is no reliable and effective therapy for chronic hepatitis C since interferon and antivirals work no more than 30% of the time, and liver transplant surgery is uncertain and tentative over the long run. This is because, ultimately, residual hepatitis C viremia infects the new liver. Furthermore, liver transplantation can be painful, disabling and extremely costly.

TREATMENT PROGRAM: The author describes a low cost and efficacious treatment program in 3 patients with cirrhosis, portal hypertension and esophageal varices secondary to chronic hepatitis C infection. This effective and conservative regimen combines 3 potent antioxidants (alpha-lipoic acid [thioctic acid], silymarin, and selenium) that possess antiviral, free radical quenching and immune boosting qualities.

CONCLUSION: There are no remarkably effective treatments for chronic hepatitis C in general use. Interferon and antivirals have less than a 30% response rate and because of the residual viremia, a newly transplanted liver usually becomes infected again. The triple antioxidant combination of alpha-lipoic acid, silymarin and selenium was chosen for a conservative treatment of hepatitis C because these substances protect the liver from free radical damage, increase the levels of other fundamental antioxidants, and interfere with viral proliferation. The 3 patients presented in this paper followed the triple antioxidant program and recovered quickly and their laboratory values remarkably improved. Furthermore, liver transplantation was avoided and the patients are back at work, carrying out their normal activities, and feeling healthy. The author offers a more conservative approach to the treatment of hepatitis C, that is exceedingly less expensive. One year of the triple antioxidant therapy described in this paper costs less than $2,000, as compared to mor than $300,000 a year for liver transplant surgery. It appears reasonable, that prior to liver transplant surgery evaluation, or during the transplant evaluation process, the conservative triple antioxidant treatment approach should be considered. If these is a significant betterment in the patient's condition, liver transplant surgery may be avoided.

Cautions and Side Effects

- Caution: Thiamine — May lead to **thiamine deficiency**. Note: blood sugar requires the utilization of thiamine during metabolism
- ALA causes an increase in the metabolism of glucose/blood sugar. — During exercise, dieting, energy requirements Check blood sugar of diabetics on ALA
- Alpha-lipoic acid may lower levels of thyroid hormone – monitor thyroid function tests
- If you administer too rapidly it will cause phlebitis (warm painful vein)

Dosing

- 5 mg/ml or 100mg/mL
  - Due to current potency
- IV infusion 100- 250 mg
- 250cc of D5W or NS
  - The safe dose range for ALA ranges from 100-600 mg
- ALA has demonstrated increased adverse effects when given as an IV push

*IVNTP does not recommend administering ALA as a push

Adverse Effects of High Doses of Intravenous Alpha Lipoic Acid on Liver Mitochondria

Abstract

Alpha lipoic acid (ALA, thioctic acid), among other actions, is an essential coenzyme in the conversion of pyruvate to acetyl co-enzyme A. Therefore, it is necessary for the production of energy for aerobic organisms. Scientists have found that it can be used medically to help regenerate liver tissue, reverse the complications of diabetes mellitus, slow or stop the growth of cancer cells, and chelate heavy metals, among other actions. In this article, the authors describe the **cellular mitochondrial damage from excessively high doses of this beneficial agent.**

Michael Vigil, MD, Burton M. Berkson, MD, MS, PhD, and Ana Patricia Garcia, DVM, MS, PhD

- Equipment: DHEP etc free bags
- Dark room or cover (ie: aluminum foil) over glass bottle/ tubing
- Precipitates with Magnesium and calcium gluconate
- Normal Saline or D5W

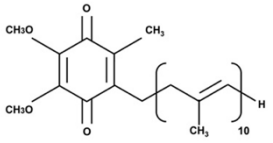
NEVER MIX ANYTHING IN THE SAME BAG WITH ALA!!

•Precipitates with other minerals and can also cause thrombus when mixed with other nutrients.
•You may run other nutrients in the same day or a series of infusions.
Make sure to change for flush the line between ALA and the nutrients.

Final Note

- **Potentiates and Regenerates:**
  Vit C,
  Glutathione,
  Vit E
  CoQ10.
  EDS (Ehlers Danos Syndrome)
  MCAS (Mast Cell activation Syndrome)

CoQ10*
(Ubiquinone))



Structure of CoQ10

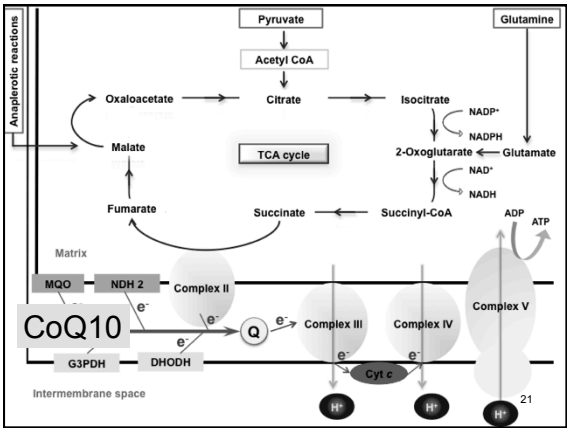
CoQ10 (Ubiquinone)

- 20 mg/ml
- Anti-oxidant and mitochondrial support
- Sterile oil is ONLY used IM
- Intravenous form is soluble in liquid delivered like alpha-lipoic acid
- Give alone in non-ionic D5W, cover the bag (light sensitive)
- Use filtered lines
- Dosage: 100 – 600 mg
- 250 – 500 ml D5W
- Slow infusion time of 90 – 120 minutes to minimize side effects.

CoQ10 (Ubiquinone)

Think mitochondrial support

- Heart Disease
- Huntington's Disease
- Infertility
- Migraine Headaches
- Statin myopathy
- Cancer
- Parkinson's



Arch Iran Med. 2016 Aug;19(8):588-96. doi: 0161908/AIM.0012.

Effect of Coenzyme Q10 Supplementation on Diabetes Biomarkers: a Systematic Review and Meta-analysis of Randomized Controlled Clinical Trials.

Moradi M[1], Haghighatdoost F[1], Feizi A[2], Larijani B[3], Azadbakht L[4].

Abstract

BACKGROUND:

Several studies have investigated the effect of Co-Q10 on diabetes biomarkers, but findings are inconsistent. This systematic review and meta-analysis of clinical trials was conducted to summarize the effect of Co-Q10 supplementation on diabetes biomarkers.

METHODS:

We searched Pubmed, EMBASE, Science direct, ISI web of science, and Google Scholar for randomized controlled trials from 1989 until March 2016. We included randomized controlled trials reporting fasting blood glucose (FBG), fasting insulin and HbA1c. In total, we found 16 articles that examined the effect of Co-Q10 on fasting blood glucose, fasting insulin and HbA1c. Mean ± standard deviations (SD) of defined outcomes were used for calculating standardized mean differences (SMD) and its 95% confidence interval (95%CI) between intervention and control treatments based on Hedges' estimator.

RESULTS:

Our preliminary meta-analysis on 14 eligible studies regarding the effect of Co-Q10 supplementation on FBG indicated a slightly significant decrement (SMD:-0.28 mg/d; 95% CI: -0.12, 0.04), with a substantial between-study heterogeneity (Cochrane Q test, I2 = 93.9%, P < 0.0001). After removal of three studies, heterogeneity was eliminated and a slightly significant decrease was found in FBG (SMD: -0.20 mg/dL, 95% CI: -0.38, -0.02). The effect of Co-Q10 on HbA1c and fasting insulin was not significant. SMDs for the effect of Co-Q10 on HbA1c and fasting insulin were -0.05% (95% CI: -0.22, 0.12) and 0.12 pmol/L (95% CI: -0.21, 0.44), respectively.

CONCLUSION:

Co-Q10 supplementation slightly but significantly reduced fasting blood glucose, but not fasting insulin and HbA1c. More long-term studies are necessary to examine the association between Co-Q10 supplementation and diabetes biomarkers.

CoQ10 (Ubiquinone)

Drug Interactions

Caution with patients on warfarin. Has the potential to inhibit warfarin effects. Similar structure to vitamin K

*Wyman M, Leonard M, Morledge T (July 2010). "Coenzyme Q10: a therapy for hypertension and statin-induced myalgia?". Cleve Clin J Med. **77** (7): 435–42.*

CoQ10 Potential Side Effects

- Headache, dizziness, nausea, fatigue, sensitivity to light, diarrhea, insomnia, indigestion, flushing, abdominal pain, rash
- *flush the line or change out the line if doing another infusion.
- In the applications for skin health it may inhibit the production of IL-6 which stimulates fibroblasts to up-regulation of matrix metalloproteinase.
- MMP play a role in many physiological and pathological processes.