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Adv Drug Deliv Rev. 2008 Oct-Nov;60(13-14):1561-7. doi: 10.1016/j.addr.2008.05.001. Epub 2008 Jul 4.

The mitochondrial cocktail: rationale for combined nutraceutical therapy in mitochondrial cytopathies.

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Abstract

Mitochondrial cytopathies ultimately lead to a reduction in aerobic energy transduction, depletion of alternative energy stores, increased oxidative stress, apoptosis and necrosis. Specific combinations of nutraceutical compounds can target many of the aforementioned biochemical pathways. Antioxidants combined with cofactors that can bypass specific electron transport chain defects and the provision of alternative energy sources represents a specific targeted strategy. To date, there has been only one randomized double-blind clinical trial using a combination nutraceutical therapy and it showed that the combination of creatine monohydrate, coenzyme Q10, and alpha-lipoic acid reduced lactate and markers of oxidative stress in patients with mitochondrial cytopathies. Future studies need to use larger numbers of patients with well defined clinical and surrogate marker outcomes to clarify the potential role for combination nutraceuticals ("mitochondrial cocktail") as a therapy for mitochondrial cytopathies.

PMID: 18647623 [PubMed - indexed for MEDLINE]



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