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TITLE

TARGETING METABOLIC DISORDERS IMPROVING CNS-OVARIAN AXIS FOR IMPROVED FERTILITY USING ACETYL-L-CARNITINE (ALC) AND L-CARNITINE (LC)

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ABSTRACT

Reproduction is a complex biological event that occurs only when the biological components are in an optimal and equilibrated condition. Metabolism and stress-induced mechanisms are the most relevant factors that can impair reproduction and functional hypothalamic amenorrhea (FHA) is a classic example of this. FHA is characterized by neuroendocrine impairment that negatively modulates endocrine function and the reproductive axis. FHA typically shows normal up to hypo LH and hypoestrogenism. No definite therapeutic strategy has been proposed.

On such basis we evaluated the response to an integrative treatment using both L-carnitine and acetyl-L-carnitine in a group of 27 patients affected by stress-induced FHA were divided in 2 groups according to LH plasma levels. Group A, hypo LH (LH < 3 mIU/ml) (n=14) and group B, normo LH (LH > 3 mIU/ml), (n=10) were all treated with a combination of ALC (250 mg/day) and LC (500 mg/day) for 12 weeks.

Patients underwent baseline hormonal assessment, pulsatility test (for LH and FSH), GnRH stimulation test (bolus of 10 µg) (for LH and FSH) both before and close to the 12th weeks of treatment.

Under integrative treatment hypo LH patients showed a significant increase in LH plasma levels (from 1.6±0.2 to 3.3±0.4, $p<0.01$) and in LH pulse amplitude ($p< 0.05$). No changes were observed in the normo LH group. Maximal LH response and AUC under GnRH stimulation were significantly increased in hypo LH patients ($p<0.05$). No changes were observed in the normo LH patients. Amilase and cortisol plasma levels were significantly decreased while insulin plasma levels were significantly increased ($p<0.05$) only in hypo-LH patients.

These data support the hypothesis the stress-induced neuroendocrine impairments as in FHA can be counteracted by simple and metabolically active integrations such as L-carnitine and acetyl-L-carnitine.

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