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Evaluation of the Impact of Low L-Carnitine Levels in Metabolic and Hormonal Profile of Polycystic Ovary Syndrome

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Context: Polycystic Ovary Syndrome (PCOS) affects women at reproductive age and it is associated to increased metabolic risk. L-Carnitine plays an essential role in fatty acids and glucose metabolism. Its deficiency has been related to metabolic dysfunctions. Previous studies suggest that patients with PCOS have low L-carnitine levels in relation to controls. However, its impact on metabolic and hormonal profile in this syndrome is poorly understood. We hypothesized PCOS patients with low L-carnitine levels may have a higher metabolic risk in relation to patients with normal L-carnitine levels.
Objective: To compare clinical, hormonal and metabolic profiles in PCOS patients with normal and low L-carnitine levels.
Methods: Transversal study of 38 PCOS patients who came from medical appointment at Hospital das Clinicas da USP. PCOS was determined by Rotterdam criteria. Medical history, anthropometric, hormonal and metabolic measurements were collected. Serum sexual steroids and L-carnitine profile was assessed by mass spectrometry (MS/MS). Cut off for L-carnitine levels was considered normal if > 25.0 ?mol/L.
Population: PCOS patients divided in two groups Low L-Carnitine Levels (LCL) (n=20) and Normal L-Carnitine levels (NCL) (n=16).
Interventions: None.
Outcome Measures: clinical and laboratorial data.
Results: Mean L-carnitine levels in LCL vs NCL were 17.5±3.8 vs 35.4± 9.6 ?mol/L (p<0.001), respectively. Groups did not differ by age (28.0±4.1 vs 26.8±3.7 years, p=0.37), BMI (30.2±6.8 vs 32.2±4.6 m/kg2, p=0.32), waist circumference (90.6±17.5 vs 97.7±13.4 cm, p=0.31). Blood pressure was also not different. Regarding lipids metabolism, LCL group had higher levels of total cholesterol (192±38 vs 157±34 mg/dl, p=0.001), and LDL-C (118±35 vs 96±21 mg/dl, p=0.04) than NCL. Groups did not differ from Triglycerides/HDL-C ratio (2.67±2.10 vs 2.89±1.83, p=0.76). HOMA-IR trended lower in the LCL group (3.38±1.43 vs 4.75±2.86, p=0.08). Lower levels of total testosterone (0.76±0.45 vs 2.26±0.38 ng/ml, p=0.003), SDHEA (2933±2256 vs 5393±3364 ng/ml, p=0.01) and androstenedione (3.77±2.98 vs 7.65±3.11 nmol/l, p=0.0004) were also found in the LCL vs NCL groups.
Conclusions: Our study suggests that low L-carnitine levels in PCOS may be associated with a worst lipid profile. In opposite to our hypothesis, low L-carnitine also seems to be related with a better androgen profile and glucose metabolism. More studies are needed to confirm our preliminary findings.

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