

EFFECTS OF ORAL ESSENTIAL AMINO ACID SUPPLEMENTATION IN CACHECTIC INSULINE RESISTANCE PATIENTS WITH CHRONIC HEART FAILURE

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Background and aim: Cardiac cachexia (CC) is a common complication of chronic heart failure (CHF) characterized by a generalized loss of skeletal muscle mass, as well as fat and bone tissues. CC is an independent risk factor associated with very poor prognosis. Plasma hormone and neuroendocrine abnormalities, inflammatory cytokine activation may play a crucial role for determining CC. Among these mechanisms, insulin resistance may mediate over time a progressive worsening of CC. The improvement of nutritional and metabolic abnormalities in CHF-CC patients with insulin resistance may be of paramount importance for a better prognosis. We hypothesized that a supplementation with essential amino acids (EAAs) may serve the scope as these substrates, particularly leucine, are insulin-independent in their entry into both muscle cell and energy-producing aerobic pathway. **Patients and methods:** Thirty-two untrained, clinically stable, cachectic insulin-resistance outpatients with moderate to severe CHF were enrolled for this randomized double blinded placebo controlled study. Cachexia was diagnosed when current body weight was 92.5% or less of usual body weight registered in the last 6-12 months. After overnight fasting, all patients underwent both nutritional and metabolic interventions. Nutritional investigation comprised 1) nutritional intake determination and 2) 24-hrs urine-nitrogen loss in order to calculate nitrogen balance. Metabolic investigation consisted in determining plasma lactate concentration. After nutritional and metabolic investigations, patients were randomized to receive for 2 months 8g/day supplementation of soluble oral EAAs (EAA-group) providing 90 kcal energy or isocaloric placebo (fruit juice) (Placebo-group). After two month supplementation, all patients underwent the same investigations as at the beginning of the study. **Results:** Before nutritional supplementation, CHF-CC subgroups had similar body weight, energy-, protein-, lipid-intakes as well as plasma lactate concentrations. Two months after supplementation, EAA-group but not Placebo one increased body weight ($P<0.01$). Eighty percent of EAA-group and 30% of Placebo-group increased body weight ($P<0.05$). Tested nutritional parameters were unchanged between the two subgroups and within the single group before and after 2 months. Plasma lactate increased in 90% and decreased in 100% of Placebo and EAA-patients, respectively ($P<0.001$). The intergroup difference overtime resulted highly significant ($P<0.001$). **Conclusions:** Oral supplementation of EAAs may improve body weight and cellular metabolism in clinical stable cachectic insulin resistant CHF patients. We hypothesize that EAAs are able to overriding cellular impaired metabolism favouring the aerobic processes indispensable for a net protein synthesis.