**Abstract poster Endo 2013 San Francisco**

**The Effect of an Ad-Libitum Low-Carbohydrate Non-Ketogenic High-Protein Diet on Body Composition Parameters**

**Introduction:** It is generally believed that high-protein diets result in a significant weight loss at the initial phases of the diet due to water loss3. A growing body of evidence however suggests that a low-fat high-protein diet (25-35% of energy) may increase body fat mass (FM) loss and attenuate reductions in fat-free mass (FFM) and resting energy expenditure4, but findings have not been consistent. We are not aware of any studies that have investigated the effects of an ad-libitum low-carbohydrate non-ketogenic high-protein diet on body composition. The aim of this retrospective study is to assess effects of such a diet on FM, FFM, muscle mass (MM), and body water content after 6months follow-up.

**Methods:** Fifty four obese, hyperinsulinemic, non-diabetic individuals (21 males, 33 females; mean age 43.1±11.1years, mean weight 89.2±17.8kg, mean BMI 33.3±6.1kg/m2) reporting to our clinic, instructed on an ad-libitum low-carbohydrate non-ketogenic high-protein diet, participated in the study. Patients were also prescribed 1500-2000g/day of Metformin to control for their hyperinsulinemia. Patients were encouraged to exercise and maintain a healthy lifestyle. No restrictions on use, amount, or type of fat were made. The diets provided 130-150g of carbohydrate per day to prevent ketosis. Body composition parameters: FFM, FM, MM, intracellular water (ICW) and extracellular water (ECW) were assessed at baseline, 1month, 3months, and 6months using bioelectrical impudence (Inbody 720, BioSpace, Korea).

**Results:** Weight loss (-3.3±2.6kg at 1month, -5.9±4.0kg at 3months, and -7.9±5.7kg at 6months, p<0.001) and FM loss (-2.9±1.9kg at 1month, -4.9±3.3kg at 3months, -6.8±4.8kg at 6months, p<0.001) were significant throughout the study period. No significant decrease was observed at 1month follow-up in FFM (-0.3±1.5kg, p=0.09), MM (-0.2±0.9kg, p=0.06), ICW (-0.3±1.6kg, p=0.107) or ECW (-0.1±0.5kg, p=0.466); however there was a significant decrease from baseline at 3months and 6months in FFM (-0.9±1.6kg, p<0.001 and -1.0±1.7kg, p=0.001, respectively), MM (-0.6±1.0kg, p<0.001 and -0.7±1.1kg, p<0.001, respectively), ICW (-0.6±1.7kg, p= 0.006 and -0.5±0.8kg, p< 0.001 respectively) and ECW (-0.2±0.5kg, p=0.009 and -0.2±0.5kg, p=0.010 respectively).

**Conclusion:** Contrary to common belief, the diet did not affect FFM, MM, ICW, or ECW during the first month; significant weight loss was rather observed in FM. Further to these findings, the ad-libitum low-carbohydrate non-ketogenic high-protein diet had a significant effect on weight loss, most of which was fat mass; an 8.8% reduction in weight (2/3 of which were fat), 17.7% reduction in FM, versus a reduction of 1.9% in FFM, 2.8% in MM, 2.1% in ICW, and a 1.4% decrease in ECW was observed after 6 months.

(3) Denke M. Metabolic Effects of high-protein low-carbohydrate diets. Am J Cardiol 2001; 88:59-61.(4) Wycherley T et al. Effects of energy-restricted high-protein, low-fat compared with standard-protein, low-fat diets: a meta-analysis of randomized controlled trials. Am J Clin Nutr 2012; 96: 1281-98