Cluster 2 – Progress Report for the Cluster 2 Science Advisory Body

1. CLUSTER PROJECT DETAILS

Project number: AIP-CL03
Name of Project: Pulse Science Cluster Two
Project research period: 2013-present
Period covered by this report: 2015-2016
Principal investigator and research collaborators: Dr. Gordon Zello (PI), Dr. Philip Chilibeck (PI), Dr. Donna Chizen, Dr. Roger Pierson.

NON-CONFIDENTIAL ABSTRACT/SUMMARY

Polycystic Ovary Syndrome (PCOS) is a common hormonal disorder affecting 5-12% of young women. Women with PCOS have irregular menstrual cycles, abnormal ovarian function (which affects ability to become pregnant), and elevated levels of male hormones. Although the cause is not fully understood, most women with PCOS have high levels of insulin which is a hormone that can increase the odds of developing diabetes, abdominal fat, and high blood cholesterol. Pulse-based diets (i.e. diets high in legumes such as lentils, chickpeas, beans, and peas) are effective for lowering insulin; thus, our aim was to determine whether a pulse-based diet was equally or more effective than a standard healthy low-fat diet for improving body composition, liver fat levels, measures of ability to become pregnant, and blood cholesterol levels. A diagnosis of PCOS was made in women aged 18-35 years by an obstetrics-gynecologist and required the presence of two of the three diagnostic criteria as defined by the Rotterdam consensus: A self-reported history of menstrual cycles greater than 35 days in length, elevated male hormones levels, as well as, polycystic ovaries. Sixty-one women completed the 16-week intervention of either the pulse-based diet (n=30) or another healthy diet known as the National Cholesterol Education Program (NCEP) therapeutic lifestyle changes (TLC) diet (n=31). Prior to starting the intervention, participants met with a registered dietitian who explained the TLC diet and discussed a four-day food record previously given to participants. All women followed the TLC diet for two weeks leading up to the intervention to get used to eating more healthy foods and determine likes and dislikes of food ingredients. During the intervention, all women randomized to the pulse-based diet received two pre-made pulse-based meals per day. Participants also received a gym orientation and all women were instructed to exercise for 45 minutes per day for five days per week, with three exercise sessions per week at the research gym facility. All women were also given log books to record daily exercise and compliance with the diet. Measures were repeated at six and 12 months following completion of the intervention to determine whether participants continue to follow the "standard of care" recommendations (i.e. TLC diet and exercise) and for those randomized to the pulse-based diet if they continue to consume pulses. Results indicate that both healthy diets resulted in significantly lower body weight, percent fat, and trunk fat mass with no changes in lean body mass. Both diets also led to improvements in reproductive measurements (i.e. increased menstrual cycle regularity). Although bone mineral density in the hip was reduced in both groups, bone mineral density of the spine was higher following the intervention. Insulin, one of the main factors associated with many of the characteristics of PCOS, was also lower in both groups following the intervention; however, only the pulse-based diet led to lower triglycerides at the end of the intervention and the pulse-based diet was more effective at lowering the cholesterol ratio (total cholesterol/HDL cholesterol). These results indicate that a pulse-based diet may be more effective than the TLC diet in women with PCOS.