

B-69 Free Communication/Poster - Diabetes

Wednesday, May 29, 2019, 1:00 PM - 6:00 PM
Room: CC-Hall WA2

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Comparison of Two Diabetic Education Programs Designed to Tread Adult-Onset Diabetes Mellitus

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(No relationships reported)

INTRODUCTION: Diabetes mellitus or adult onset diabetes or type 2 diabetes, is the most common form of diabetes. Millions of Americans are diagnosed with type 2 diabetes every year, and many more are unaware they are at high risk.

PURPOSE: The purpose of this study was to compare the diabetic education programs of two certified diabetic dietitians, one with a focus on diet and the other with a focus on exercise, over 6 months, to determine which program was more successful in the treatment of type 2 diabetes.

METHODS: Forty participants were randomly selected and separated into two groups. The subject pool was limited to those using oral diabetic medications. All participants had an initial evaluation of body mass index (BMI), hemoglobin A1c, fasting blood sugar, waist circumference, and weight. These measurements were repeated again after three and six months of treatment for analysis. The exercise group and the diet group each included 10 males and 10 females. The exercise (E) group met with their trainer five times per week and the diet (D) group received information about choosing foods to limit impact on blood glucose. A 2 x 3 repeated measures ANOVA was used to determine the effects of an exercise vs diet program.

RESULTS: All participants completed their respective programs. The exercise group (10 males, 10 females) were 62.4 ± 8.6 yrs and the diet group (10 males, 10 females) was of 65.1 ± 9.8 yrs. The exercise group (31.9 ± 4.5) had a significant decrease ($p < 0.05$) in BMI at 6 months when compared to the diet group (29.5 ± 4.32). Measurements of A1c (E=6.94±0.7%; D=7.77±1.1%), fasting blood glucose (E=132.2±13.4 mg/dl; D=132.2±16.0 mg/dl), waist circumference (E=40.4±4.5 in; D=45.2±6.5 in), and weight (E=207.9±43.1 lbs; D=222±43.8 lbs) decreased in both groups over the six month study, however, the changes were accelerated in the exercise group resulting in significantly lower values.

CONCLUSION: After six months of either an intensive exercise regimen or diet regimen, there were significant decreases seen for all variables. However, the results for the exercise group were associated with accelerated decreases as compared to the diet group by a significant margin. Individualized exercise programs appear to be the most effective at controlling type 2 diabetes with the potential for decreasing the risk of other comorbidities.

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Post-Meal Walking Improves Postprandial Glycaemia in Women with Gestational Diabetes Mellitus

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PURPOSE: To investigate the effects of post-meal walking (PMW) on glycaemic control in women with Gestational Diabetes Mellitus (GDM).

METHODS: Eighty women with physician-diagnosed GDM will be randomised to i) Control standard-care alone (CON), or ii) PMW in addition to standard-care, from weeks 28 to 36 of gestation. Participants in the PMW group were advised to perform 10 min of PMW after main meals, whilst the CON group were advised to perform 30 min of daily physical activity. Blood glucose was assessed using continuous Glucose Monitoring (iPro CGM) and physical activity, sedentary time and adherence was assessed using ActivPal accelerometers for 7-days at weeks 28 and 35 of gestation. Fasting glucose was measured from capillary glucometer measures each morning.

RESULTS: Preliminary data from nine women with GDM are presented (PMW n=5 and CON n=4). Postprandial, fasting glucose and physical activity did not differ between the CON and PMW groups during the first 7-day monitoring period. Compared to baseline, the PMW improved the 3-h average glucose after breakfast (-0.35 mmol.L-1, $p = 0.03$) and lunch (-0.34 mmol.L-1, $p = 0.01$), enough to remain in target ranges for blood glucose (5.0 - 7.4 mmol.L-1). No difference was seen after dinner in the PMW group (-0.11 mmol.L-1, $p = 0.22$), due to reduced adherence (40%) to PMW after dinner.

CONCLUSIONS: Preliminary data supports the notion that PMW can improve blood glucose levels after breakfast and lunch in women with GDM when adhered to, however the impact of dinner requires further research. PMW may be an effective adjunct to standard-care for the management of GDM in pregnancy.

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Accuracy Of A Handheld Blood Glucose Monitor During Exercise And An Oral Glucose Tolerance Test

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PURPOSE: The purpose of the present study was to examine the validity and reliability of a handheld blood glucose monitor during an oral glucose tolerance test (OGTT) and 60-minute bout of exercise.

METHODS: A total of 30 subjects (mean age ± SD = 22.3 ± 1.9 yrs; body mass = 77.6 ± 14.2 kg; height = 171.3 ± 9.6 cm; physical activity = 6.2 ± 4.3 hr·wk⁻¹) volunteered to participate in a single visit to the laboratory for an OGTT (n=15) or 60-minute treadmill exercise test (n=15). For the OGTT, the subjects were required to visit the laboratory in the morning following an 8-hour overnight fast and ingest a 75-gram load of glucose. For the treadmill test, the subjects were required to walk at 5.6 km·hr⁻¹ for 60 minutes. Blood glucose concentrations were measured from the fingertip at six different time points during the OGTT (0, 10, 20, 30, 60, and 90 min) and treadmill test (0, 5, 10, 15, 30, and 60 min). Each blood sample was analyzed four times at each time point, two by the reference method and two by the handheld monitor.

RESULTS: Our findings indicated that the blood glucose values provided by the handheld monitor were significantly ($P < 0.05$) greater than the reference method at all time points of the OGTT and treadmill test. In addition, the handheld device exhibited an overall mean absolute relative deviation (±SD) of 9.0 (±7.0) and did not meet the 95% accuracy requirements of ISO 15197:2013 (only 87.2% of all values met the criteria). The Bland-Altman plot for constant error (reference method - handheld monitor) versus the reference method indicated an average negative bias (CE = -8.2 mg·dL⁻¹) that increased ($r = -0.23$) at higher blood glucose values. Intra-device reliability analyses for the handheld monitor on two consecutive measurements taken at the same time points demonstrated the intra-class correlation (ICC) was $R = 0.99$ and coefficient of variation (CV) = 3.0%, with no mean differences between measurements.

CONCLUSIONS: The present findings indicated that the handheld monitor provided highly reliable, yet inaccurately high blood glucose values compared to the reference method during the dynamic conditions associated with an OGTT and exercise.