

The Improvement of Pancreatic Function in Middle-Aged Diabetic Males

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Abstract

The improvement of pancreatic function in type 2 diabetic middle-aged males is dependent upon the compliance of three main metabolic components: pancreatic beta cell function, level of insulin sensitivity, and fasting blood glucose attached to hemoglobin (HbA1c). Declined functioning of these components are commonly seen in middle-aged individuals. According to (Thompson, et al., 140), "increased age is a high risk qualification for type 2 diabetics over the age of 45". According to (Prior et al., 2014), "middle-aged and older overweight individuals diagnosed with insulin glucose tolerance have impaired glucose uptake in response to insulin and other metabolic dysfunctions". The aim of this study was to observe pancreatic beta cell function and how it is improved after short-termed submaximal aerobic exercise has been induced. Fifty participants were chosen from North Carolina and completed the study at a local master's education level institution. The participants that met the criteria for this study were asked to complete an informed consent form and a PAR-Q+ questionnaire prior to engagement in the study. The participants underwent oral glucose tolerance testing, submaximal aerobic exercise interventions, and VO2 maximum testing. Data was compiled through ANOVA software and presented in mean SE format. Numerical values were posted prior and post exercise completion for proper comparison. It is hypothesized that aerobically induced exercise improves pancreatic beta cell function and lowers fasting blood glucose level allowing for increased insulin production and secretion in diabetic individuals.

Introduction

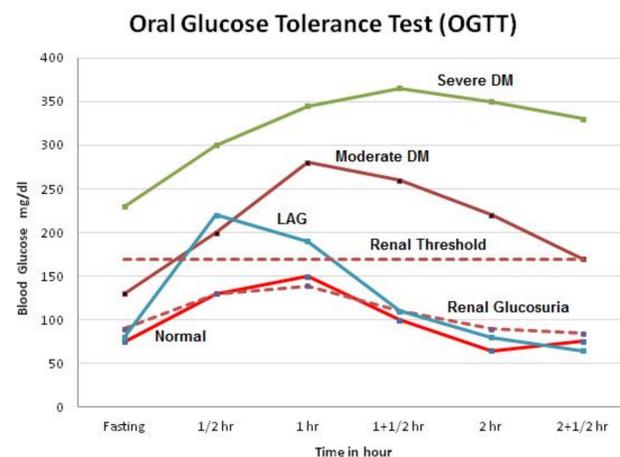
- Type 2 diabetes is a prevalent issue in society and typically affects middle-aged (45-65 years old) individuals more frequently.
- To improve pancreatic function in middle-aged affected males, regular submaximal aerobic exercise may be the key to improvement.
- According to (Yavari, et al., 2012), "aerobic exercise improves glycaemic control, cardiovascular risk factors and metabolic profile in type 2 diabetics".
- This research proposal attempts to answer how pancreatic beta cells improve function after aerobic exercise has been induced.
- The aim of this study examined pancreatic beta cell characteristics and improvement after submaximal aerobic exercise had been administered in type 2 diabetic males.
- It is hypothesized that improvement in beta cell function and lowered fasting blood glucose levels would be observed after exercise had been completed. Therefore, allowing for proper production and secretion of insulin by the pancreas.

Experimental Design and Methods

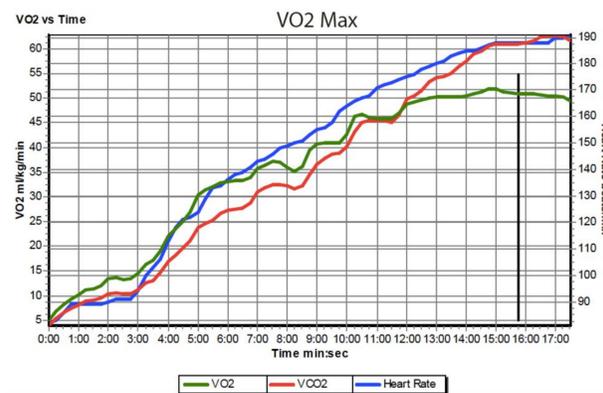
- Participants involved fifty middle-aged (45-65 year old) males from North Carolina.
- Participants had been diagnosed with type 2 diabetes for at least 6 months and were allowed to continue taking oral glucose management prescriptions during testing interventions.
- Participants engaged in 2 weeks of submaximal aerobic exercise intervention on a monark ergometric bicycle and were subject to oral glucose tolerance testing and VO2 maximum testing.
- These procedures were used to monitor both pancreatic function and fasting blood glucose levels prior and after the study had been completed.
- Participants signed an informed consent form and PAR Q + questionnaire which gave medical clearance to each subject.
- Oral glucose tolerance testing involved drawing blood samples prior and after exercise had been completed to observe blood glucose levels and how they responded to exercise.
- VO2 maximum testing was used to assess oxygen consumption and how it fluctuates due to exercise.

How does submaximal aerobic exercise improve pancreatic function in diabetic males?

Oral Glucose Tolerance Test



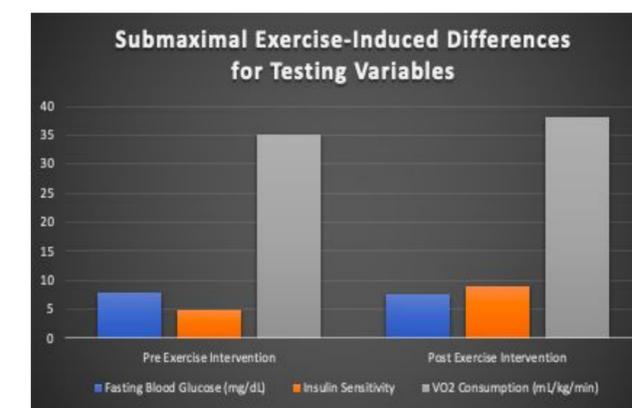
Monark Ergometric Exercise



VO2 Maximum Testing

Data Analysis

- For statistical analysis, this study used ANOVA software and data was presented in mean +/- SE (standard error).
- A two-sided p-value of 0.05 or less was used to represent statistical importance of data presented in this study.
- Each participant had measurements for insulin sensitivity, fasting blood glucose, and VO2 max recorded prior and post exercise intervention so that a detailed analysis could be processed.
- This study analyzed two points of interest: 1) levels of fasting blood glucose, insulin sensitivity, and VO2 maximum level prior to any engagement in aerobic exercise, and 2) improvements seen in these variables after a short-term exercise intervention had been completed.



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Summary and Conclusive Predictions

- Fasting blood glucose levels should lower along with increased sensitivity to insulin.
- Pancreatic production and secretion of insulin should become more efficient in the working diabetic individual.
- Oxygen consumption levels during VO2 maximum testing should increase after short-termed exercise has occurred.
- Reoccurring exercise should be completed to continually improve pancreatic function and keep fasting blood glucose level.

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