

Insulin Resistance and HbA_{1c} Benefits for Adolescents and Adults Aged 18-70 with Type 1 Diabetes after Completing HIIT Programs

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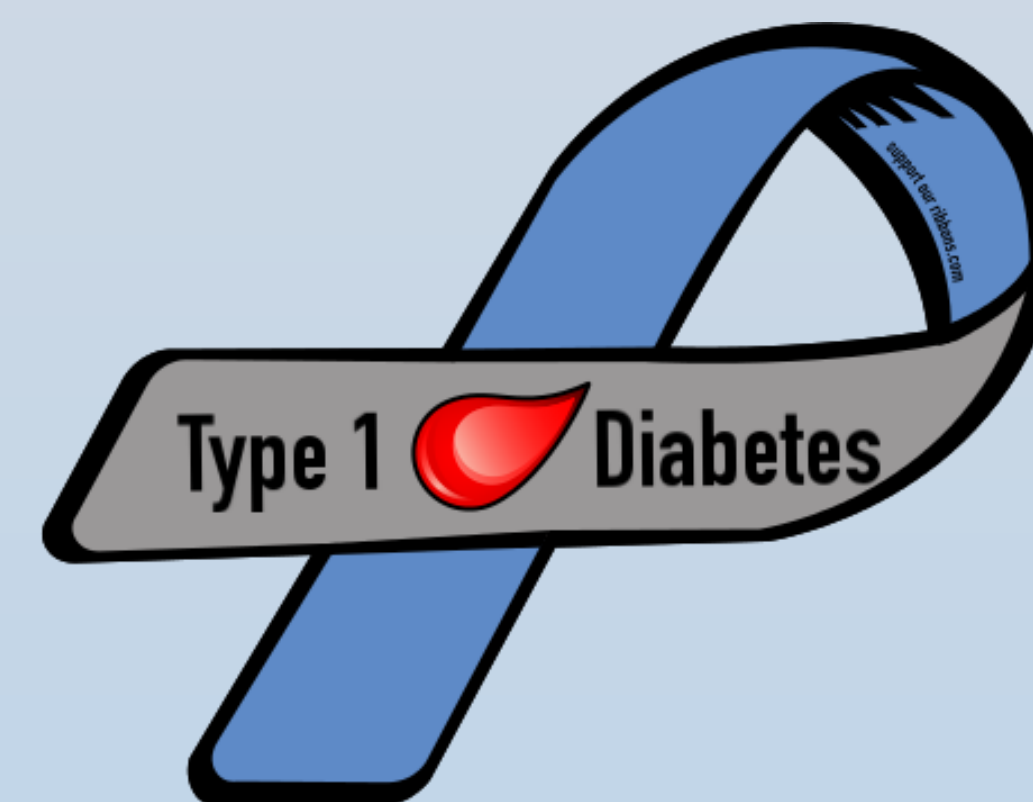
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ABSTRACT

- T1D is considered an autoimmune disease in which the pancreas is unable to produce insulin to balance blood glucose levels.
- Research has shown that type 1 diabetes is also the result of an autoimmune reaction that induces the destruction to the pancreatic beta-cells in the pancreas, which produce insulin (Rodbard, 2017).
- HIIT is a style of exercise that has gained popularity throughout the 2010s (Ito, 2019).
- HIIT involves a series of anaerobic exercises at high intensity levels ($\geq 80\%$ of VO_2 peak) (Lee, A., Johnson, N., McGill, M., & Overland, J., 2020).



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OPERATIONAL DEFINITIONS

Continuous glucose monitor (CGM): continuous glucose monitors are a form of diabetic equipment which enables a person to visualize patterns of glucose throughout the day and check blood sugar at any given point in time (Rodbard, 2017).



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Hemoglobin A_{1c} (HbA_{1c}): HbA_{1c} or hemoglobin A1C is a diagnostic test used to evaluate a person's blood glucose levels over the past two to three months (Gilstrap, et. al, 2019).

High intensity interval training (HIIT) exercise: The term high intensity interval training (HIIT), refers to a style of exercise that focuses on high-intensity exercise with aerobic intervals (Ito, 2019).



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Type 1 Diabetes (T1D): Type 1 diabetes mellitus is a condition which is caused by an autoimmune response against pancreatic β cells. This chronic condition causes the pancreas to produce little or no insulin (DiMeglio, et. al, 2018).

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METHODS

Participants:

- 150 total
- 75 males
- 75 females

Criteria:

- Must have been diagnosed with T1D for at least five years.
- Own and be comfortable with using a CGM.
- Be within the age range parameters of the study.
- Have an HbA_{1c} of $\geq 6.2\%$.

Limitations:

- Smaller population size.
- Limited exercises for accessibility.
- Had to exercise under professional supervision.

Data Analysis:

- Data collection was used to compare the improvements and effects of exercise in the insulin resistance and HbA_{1c} levels of type 1 diabetics (McArdle, et. al, 2015).
- This study employs parametric statistics which uses interval data and a Pearson Product-Moment calculation.
- An independent t test was utilized since there were two groups being tested.
- The blood samples collected from participants fingers and HbA_{1c} results collected from the arm of the participants were conveyed by utilizing descriptive statistical analysis in order to alter the variables during the HIIT workouts.

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