

ONE YEAR OF HIGH INTENSITY S ON FBS AND OBESITY ON A TYPE II DIABETIC SUBJECT – EVIDENCE BASED STUDY

Dr. S. S. Subramanian*

The Principal, Sree Balaji College of Physiotherapy, Chennai – 100.

Affiliated To (Bharath) University, BIHER Chennai – 73.

Article Received on
07 November 2017,

Revised on 26 Dec. 2017,
Accepted on 16 Jan. 2018

DOI: 10.20959/wjpr20183-10837

*Corresponding Author

Dr. S. S. Subramanian

The Principal, Sree Balaji
College of Physiotherapy,
Chennai – 100.

ABSTRACT

Type II diabetic subjects treated with insulin therapy can be treated along with non pharmacological means using physical exercises. Physical training with high intensity means are well tolerated by geriatric subjects and more a means of challenging and motivating **Materials & Methodology:** 62 year male on 20 units insulin therapy (Type II diabetic) for 15 years was treated with high intensity resisted exercises from 23.12.2016 to 20.12.2017 with weekly twice frequency at Chennai. Pre and Post FBS and WC were recorded and analyzed statistically. **Results:** shows an improved FBS and WC with HIE with

statistically significant ($P < .001$) **Conclusion:** An improved FBS with one year follow up using HIE among type II diabetic subjects needs long term follow up and larger sample size for further validity.

KEYWORDS: Geriatrics, HIE, High Intensity Exercise, FBS – Fasting Blood Sugar.

INTRODUCTION

Exercises along with diet, medication forms one of the 3 corner stones in the diabetes therapy and non pharmacological nature of physical activity and low cost are other benefits along with therapeutic effects of preventing diabetes related complications (Yki Yarvinen 1998). To reduce obesity and chronic hyper glycemia are the major goals of diabetes therapy. As obesity, mainly abdominal one is associated with dyslipidemia, hypertension, hyper insulin anemia hyperglycemia (Desprs 2008) and chronic hyperglycemia is linked with long term complications, such as damage to kidneys, eye, nerves, heart and blood vessels (Yki Yarvinen 1998) numerous studies on the effects of exercise in patients with type II diabetes and their findings varied (Boule etal 2005) this original study aims at analyzing. The effects

of high intensity internal exercises on a type II diabetic subject on insulin therapy treated for one year and its effects on obesity and FBS.

Aims & Objective

Of this presentation was to analyse the efficacy of HIE on FBS and obesity in a one year follow up of a type II diabetic subejct on insulin therapy.

MATERIALS AND METHODOLOGY

Past Medical History

Mr. XXX, 61 years old male an engineer, vegetarian, known type II diabetic on medication for 30 years with parents were diabetic. Since 2010, he was on 20 units of lantus insulin therapy, with sedentary life style, his HbA₁C was 9% in 23-12-2016 and fasting blood sugar was at 145 mg/ 100 ml, BMI 26/kg/m², WC – 98 cm.

Procedure

This original research was conducted in Chennai during the period from 23.12.2016 to 20.12.2017. The subject was treated with non pharmacological intervention, using 12 specific core exercises with 5 repetitions using Physioball as a tool of resisted exercises with a frequency of twice a week. Pre FBS and WC on 23.12.2016 WC and post fasting blood and WC sugar on 20.12.2017 were evaluated, recorded and analyzed with statistical means in the following ways.

RESULTS

Generalized sweating was recorded no hypoglycemic spells were noted. He was able to tolerate an exercise intensity of >80% of MHR (Which was increased gradually).

He has given a feed back of an increased energy level for daily activities, started walking regularly, was confident to improve HbA₁C, and wishing to continue anti diabetic tablets instead of insulin therapy with his diabetologist's advice.

Table of results of pre and post FBS and WC with high intensity exercises using student 't' test.

		Mean	SD	SE	t	p
FBS mg / 100ml	Pre	145	17.32	10	3.08	<.001
	Post	115				
WC Cm	Pre	98	4	2.33	3.04	<.001
	Post	91				

DISCUSSION

As with reference to the above table of results the following scientific questions to be answered with evidence as below:

- Is high intensity exercises effective among subjects on insulin therapy?
- Does FBS improves with HIE?
- One year of HIE how much prognosis expect with FBS?
- Impact of reduction on FBS on subjects QOL
- HIE does it influences obesity?
- 12 week high intensity interval training among 36 untrained normal subjects have an improved glucose tolerance and cardio respiratory fitness (Nybo et al 2010).
- Babraj et al 2009 have among young healthy made extremely short duration high intensity interval training to improve insulin action. Short term high intensity interval training could be a time efficient strategy for health promotion and Among diabetic and obese subjects, high intensity training is more effective than moderate intensity training.
- Little et al 2011 have among 8 type II diabetic subjects in six sessions for two weeks low volume high intensity interval training has reduced hyper glycemia and increased muscle mitochondrial capacity, along with influence on obesity as recorded in this study was an added benefit apart from an improved glycemic control.
- Six sessions of low volume HIT over 2 week increases skeletal muscle mitochondrial capacity which may be of clinical relevance for type II diabetic given that reduced content or biogenesis of mitochondrial have been implicated in insulin resistance and type II diabetic.
- As low volume HIT may result in many of the same health benefits as traditional exercise training with substantially reduced exercise volume and time commitment, this strategy to improve skeletal muscle metabolic control and glycemic regulation in patients with type II diabetic mellitus (Little et al 2011) is highly recommended among diabetic care.
- With 250k cal of work with low volume, HIT is significant to achieve glycemic control in sedentary young adults as shown by (Babraj et al 2009) with weekly energy cost with sustained improve in insulin action with no change in body weight, an improved glycemic control with lowered FBS, which was sustained with one year therapy with HIE of this subject was supported by these research findings.

Critical Analysis of this Study

- Only FBS and WC were measured and FBS and WC were measured and PPBG, hba_{1c}, homa index, were not analyzed in this study.
- Subjective analysis on QOL was not evaluated as study outcome.
- This was only a case study.

CONCLUSION

Reduction in FBS and obesity with HIE, were the key outcome of this study, which requires further stronger validity of larger subject participation comparing other glycemic variables such as hba_{1c}, homa index, having control group. An improved quality of life of this subject along with are further worthy to state.

REFERENCES

1. Yki-Järvinen. Toxicity of hyperglycaemia in Type 2 diabetes. *Diabetes/Metabolism Research and Reviews*. *Diabetes Metab.*, 1998; 14: S45- S50.
2. Despres JP, Lemieux I, Bergeron J, Pibarot P, Mathieu P, Larose E, Rodes-Cabau J, Bertrand OF, Poirier P. Abdominal obesity and the metabolic syndrome: Contribution to global cardiometabolic risk. *Arterioscler Thromb Vasc Biol.*, 2008; 28: 1039–1049.
3. Boule NG, Weisnagel SJ, Lakka TA, Tremblay A, Bergman RN, Rankinen T, Leon AS, Skinner JS, Wilmore JH, Rao DC, Bouchard C. Effects of exercise training on glucose homeostasis: The heritage family study. *Diabetes Care.*, 2005; 28: 108–114.
4. Nybo, Emil Sundstrup, Markus D. Jakobsen, Magni Mohr, Therese Hornstrup, Lene Simonsen, Jens Bu' Low , Morten B. Randers, Jens J. Nielsen, Per Aagaard, And Peter Krstrup. High-Intensity Training versus Traditional Exercise Interventions for Promoting Health. *Medicine & Science In Sports & Exercise*. The American College of Sports Medicine., 2010; 1951-1968.
5. Babraj JA, Vollaard NB, Keast C, Guppy FM, Cottrell G, Timmons JA. Extremely short duration high intensity interval training substantially improves insulin action in young healthy males. *BMC Endocr Disord.*, 2009; 9: 3–11.
6. Little JP, Gillen JB, Percival ME, et al.: Low-volume high-intensity interval training reduces hyperglycemia and increases muscle mitochondrial capacity in patients with type 2 diabetes. *J Appl Physiol.*, 1985, 2011; 111: 1554–1560.
7. Bajpeyi S, Tanner CJ, Slentz CA, et al. Effect of exercise intensity and volume on persistence of insulin sensitivity during training cessation. *J Appl Physiol.*, 2009; 106(4): 1079–85.