P-0541– Effect of 12 weeks structured exercise training on Insulin resistance in Type 2 Diabetes Mellitus: A Pre-Post study

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Introduction

- Diabetes mellitus is a chronic metabolic disease characterized by chronic hyperglycemia which is associated with impaired carbohydrate, lipid, and protein metabolism. (Motahari-Tabari 2014)
- Type 2 diabetes is increasing rapidly around the world parallel to increase in the obesity.
- In 2011, an estimated **366** million people had diabetes (most of which is type 2) which is projected to increase **552** million by **2030**. (Aune et.al., 2015)
- T2DM is characterized by elevated glucose levels in circulating blood, caused by impairment in glucose tolerance which is responsible for the development of insulin resistance & relative insulin deficiency
- IR impair the ability of muscle cells to take up & store glucose, triglycerides, which results in **higher levels** of glucose & triglycerides circulating in blood
- Impaired **glucose control** & **IR** are reported to be a risk factor for development of cardiovascular disease.
- Exercise and Physical activity have been considered as a cornerstone for the treatment and prevention of diabetes. (Short et al., 2008)
- Need for the study:** In Indian population, Insulin resistance is one of the strong reason for altered glycemic control, even though exercise training is found to be effective in glycemic control along with the standard medical care. There is a dearth of literature in the effectiveness of exercise training on insulin resistance in type 2 diabetes mellitus.
- Aim:** To find out the effect of structured exercise program on insulin resistance by using Fasting insulin level and Homa-IR in T2DM.

Materials and Methods

Inclusion criteria: Aged 30-75 years who are with T2DM & Oral hypoglycemic agent with or without Insulin therapy

Exclusion criteria: Type 1 diabetes mellitus, known case of Respiratory disease, Coronary artery disease, Neurological disorders, Musculoskeletal problems that would interfere with the exercise training

Tools: Stadiometer, Weighing scale, Bioelectrical impedance analyser, Skin fold caliper, Measuring tape, Motorized treadmill, Radio-telemetric heart rate monitor

Procedure:

- Total 17 participants were recruited. All participants were screened clinically & biochemically and given a set of structured exercise program 3 times a week for 12 weeks along with standard medical care.
- The exercise protocol included warm-up by stretching and flexibility exercises for 10 min. It mainly consisted of aerobic and resistance exercise like brisk walking for 45 mins, weights for upper and lower body major muscle groups with maximum intensity 60% increase in heart rate and then stretching in the seated position for 10 min.
- Resistance to insulin was assessed using Homeostasis Model Assessment of Insulin Resistance (HOMA-IR), Fasting insulin level and Fasting blood sugar.

Results

Table 1: Demographic Data

Age in years	59.23 ± 8.38
Duration of Diabetes in years	10.82 ± 7.82
Body Mass Index	26.64 ± 4.09

Table 2: Pre & Post changes

Parameter	Pre (mean ± SD)	Post (mean ± SD)	Pre-post (mean ± SD)	P value
Fasting Insulin (μU/ml)	21.20 ± 12.13	12.86 ± 8.34	8.34±6.60	0.000*
Homa- IR	10.49 ± 6.54	5.18 ± 4.8	5.31±6.64	0.005*
Fasting blood sugar (mg/dl)	164.35 ± 48.26	127.29 ± 21.59	37.05±47.35	0.005*

p < 0.05 *

Conclusion

From the current study findings we suggest that 12 weeks of structured exercise program training three times a week was effective on insulin resistance and glycaemic control in T2DM patients.

Acknowledgement: World Diabetes Foundation (WDF 15-941) Diabetic foot care: Stepping Ahead

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