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Fasting Blood glucose on Quality of Life with Aerobic Versus Resisted Exercises

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Abstract
Physical modes in the management of type II diabetic were analysed with aerobic versus resisted exercise training in this study among 150 subjects on diabetic medication. 12 weeks pre and post fasting blood sugar was recorded along with quality of life score of all the subjects. While RET subjects benefited twice than aerobic subjects with QL as major findings of this study which can be included in the diabetic care.
Keywords: *RET: Resisted Exercise Training; QL: Quality of Life; CAD: Coronary Artery Disease; FBS: Fasting Blood Sugar; VAT: Visceral Adipose Tissue.*

Introduction

The global burden of diabetes is increasing and developing countries face a grave health care burden due to this disease (Sicree et al 2006). Obesity and physical inactivity are major risk factors for the development of major chronic diseases including diabetes and premature death (Katzmarzyk et al 2003). Increased physical activity is known to be of preventive means of type II diabetes (Tuomilehto et al 2001), but also has an important role for exercise prescription in the treatment of type II diabetes (Held etal 2002). Diabetes mellitus, glucose intolerance and insulin resistance are central features of CAD risk (Braith and Stewart 2006). Unfortunately central obesity and physical inactivity hinder medical management and may hasten development of chronic complications in long standing diabetes, even when glycaemic control is near optimal with medication, here comes non pharmacological means of reducing IR with physical activities. Aerobic Exercises consistently shown to improve glycemic control (Eves et al 2006).

The inclusion of RET as part of an exercise program for promoting health and preventing disease has been endorsed by ACSM, ADA 2000. This original research study was carried out to find the efficacy of two means of physical activities and their impact on FBS and quality of life among type II diabetic subjects.

Materials and Methods

150 type II diabetic subjects on medication were recruited in this study through a diabetic camp conducted in Chennai, during May 2010. All the subjects were allotted at random in 3 groups group

I – Control (n-50), group II- experimental I (n-50) and group III – experimental II (n-50). Every participant continued their medication and daily routine, group II subjects have performed structured aerobics of weekly 5 times and group III subjects have done ten specific resisted exercises using Physioball of weekly 3 times. All the subjects fasting blood sugar and quality of life, questionnaire were evaluated and recorded twice once at the beginning and after 12 weeks completion.

Inclusion Criteria: Diagnosed and on medication with type II diabetic of both sex between 30-60 years.

Exclusion Criteria: undiagnosed, untreated type II diabetic patients.

Results

While all the subjects have completed the study, the results were tabulated, analysed and using statistical means, presented as below:

Table 1: Pre and Post means, paired 't' test of group I, II and III.

FBS	Mean		SD	SE	P
	Pre	Post			
Group I	145	152	4.7	.52	P>.1 X
Group II	143	138	18	2.6	P<.05 XX
Group III	148	140	25	4.6	P<.001 XXX

X in Significant XX Significant XXX highly Significant

Table 2: Results of Paired't' test among group II and group III

Group	SD	SE	P
II	3.87	.6	P>.1 X
III	5.63		

X in Significant

Table 3: Results of Pre and Post mean 14 items related to QOL questions of subjective nature with 7 point scale were processed from all the subjects twice once at the beginning and after 12 weeks of completion the study as below:

	Group I	Group II	Group III
Pre mean Score	50	47	5
Post Mean Score	47	52	64
Prognosis	-6%	+11%	+25%

Table 4: Nature of work of all subjects in %

Desk Work	45%
Sedantry	33%
Physical Activity	22%

Discussion

RET reduces total body fat mass independent of caloric restriction along with reduction in visceral adipose tissue and is beneficial in the prevention and management of Musculo skeletal injuries and disorders, osteoporosis and spermia (Braith and Stewart 2006). Cross sectional studies have shown that muscular strength is inversely associated with all cause mortality in the prevalence of metabolic syndrome, independent of cardio respiratory fitness levels (B, Jurca et al 2005). Group III subjects with resisted exercise training using Physioball have shown high statistically evident as inferred from table 1 with an improved glycemic control than group II aerobic subjects.

Aerobic exercises to treat or prevent obesity are evidenced (NIH 1998). Aerobic exercise has consistently been shown to improve glucose

control, reduce cardiovascular risk factors such as visceral adiposity, lipid profile (Eves etal 2000). Wilmore et al 1999 have observed that with 23 weeks of aerobic exercises significant changes in waist and hip circumferences. Benefitial effects of AE on diabetic subjects are with slight changes in the concentration of adiponectin and stress and improved glycemic control, and improve cell function (Della e tal 2004 and Ishi et al 2001). As shown in table 1 aerobic subject have benefited with improved glycemic control as statistically significant results.

Ross etal 1991 has studied diet only group second with AE and third group with RET using MRI among middle aged obese women and found greater VAT, Reduction among RET than AE and diet groups. Excessive central obesity and VAT have been linked with the development of HT, IR, DM, heart disease (Hurley et al 2000). Endurance training induced decreases in fat mass are more likely to be associated with reductions in body weight because there is no off setting gain in muscle mass (Braith and Stewart 2006). Whereas with RET body weight does not change much because loss of fat mass is off set by the gain in muscle mass (Hunter et al 2002). The risk to benefit ratio of RET is highly favour able than AE, as lower response of heart rate, hence results in lower rate- pressure product compared with AE (Pollock 2000). Many older adults' patients with type II diabetes, the presence of diabetic complications such as obesity, degenerative arthritis or cardiovascular disease may preclude participation in aerobic activities (Dunstan 2002). Weather as an impediment to walking were 3 to 5 times less likely to walk 120 minutes per week (Mathews et al 2001). Among group II and III, subjects in group III have shown a highly statistical significant result, hence RET subject's benefits more than AE subjects is prudent.

Apart from medical management, subjective perceptions, the resultant style of coping and adaptation to the physical and physiological changes in an individual with chronic diseases leads to the acceptance of resultant objective limitations (Moos 1977). cognitive dysfunction occurs in type II diabetes with hyper glycaemia (Morley and Flood 1990) and chronic diabetes have an increased prevalence of depression (Nalidoff and Rosen et al 1989). Overall prevalence of depression among type II diabetes is 31% (Anderson et al 2011) outcome of a medical treatment or any therapeutic intervention should not only rely on laboratory or clinical indicators but the yardstick to measure the impact of the intervention is by subjective evaluation of his physical health, mental well being and his quality of life (Fuhrer 1987). Life style change with diet and physical activity in a 3 year follow up study among subjects with impaired glucose tolerance by Tuomilehto et al 2006, where reduction of BMI, fasting blood glucose, recorded prevention by 60% .High intensity resisted exercise training in 16 week study conducted among Latino Americans (Carmen Castaneda 2002) have recorded an improved glycemic control. As displayed above in Table: 3, group I control subjects have shown negative improvement, aerobic group II subjects benefited by 11%. While group III Physioball subjects have benefited double amount of improved quality of life than the aerobic subjects, as subjective evaluation a major outcome of this study.

The subjects who followed a Sedantry life style were three times vulnerable to develop diabetes compared to those more physically active (Mohan etal 2003) and effect of physical inactivity on the prevalence of diabetes and cardiovascular diseases were recorded among Indian population by Mohan et al 2003;2005. As shown in table: 4, 78% of all the study subjects have Sedantry deskwork as nature of their occupation coincides with the above study.

Conclusion

This research study where improvement recorded clinically with therapeutics along with subjective evaluation on quality of life among type II diabetes gets significant as physical activities using Physioball based resisted exercises are twice

effective than aerobic exercises as this metabolic disorder is chronic and requires life style changes along with, However combining aerobic, resisted exercises, dietry and lifestyle changes are highly recommended, non- pharmacological means in the diabetic care. Limitation of this study includes shorter duration and not having included all age, type I diabetes and detraining effects of exercises are not studied.

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