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RET on Blood Glucose Profile and Obesity of a Type II Diabetic Treated with Insulin Therapy

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Abstract
Reduction of obesity and an improved glycemic control on a type II diabetic subject getting treated with insulin with resisted exercises remains the major outcome of this 3 months study. Also the quality of life improves with betterment of musculoskeletal ailments associated with diabetes.
Keywords: *NIDDM – Non Insulin Dependent Diabetes Mellitus, RET – Resisted Exercises Training, ACSM – American College of Sports Medicine, FBS – Fasting Blood Sugar, PPBG – Post Prandial Blood Glucose, Physioball – An Air Inflated Ball of 55cm.*

Introduction

Hyperglycemia, may independently contribute to the macro vascular disease in NIDDM (Phyorala etal 1987). People with NIDDM often require insulin later in the course of the disease (Carlos Abrarajra etal 1995). Higher hba_1c levels are associated with coronary artery disease (Wlin etal 1992), Myocardial infarction (Ritter etal 1985) Gangrenous amputation (Reiber etal 1992) and mortality (Kuusisto etal 1994).

The objective of the study is to establish the effectiveness of resisted exercises in improving the glycemic control and obesity on this subject with NIDDM on insulin therapy, and aiming at improving the quality of life of the subject having associated musculoskeletal ailments.

Background Information

She was getting treated with 36 units of daily lantus insulin therapy for the last 2 years female C/O Neck, back pain and numbness of both feet. Having tried with yoga, walking, is attending this centre for physiotherapy of neck and back pain subsequently having improved with musculoskeletal ailments focus has shifted for diabetic care with resisted exercises using Physioball.

Medical H/O

X- Ray Cervical Spine has revealed cervical spondylosis with moderate degenerative changes and discussion at C4 and C5.

O/E

- Anteverted scapulae.
- Mild degenerative changes of left knee.

- Forward Flexion of lumbar spine painful and restricted.
- SLR normal on both legs.
- Other peripheral joints full and no motor deficit recorded.
- Ambulant unaided with no gait deviation.
- Paresthetic sensation of feet.

Materials & Methodology

Subjects fasting, PPBG and hba_1c were measured. BMI and waist circumference were measured and recorded on 12-02-2016.

Exercises using Physioball in supine, side, prone and sitting on the ball were used along with manual resistance a set of 10 exercises with 5 repetitions and weekly two times frequency was continued for 3 months. All the sessions were carried by 05.00 P.M each session lasts for 30 – 35 minutes duration with profuse perspiration of the subject. No hypoglycemic incident was recorded during this period. Exercises were performed at 85% intensity of maximal heart rate.

After 3 months period waist circumferences, BMI, FBS, PPBG, Hba_1c were evaluated and recorded.

Table: 1 Results of pre and post blood glucose profile, BMI and waist circumference

12-02-2016	14-05-2016
FBS 201mg	161 mg
PPBG 286 mg	159 mg
Hba_1c 9.8%	7.9%
BMI – 28, Height – 165cm	BMI -24
Body Weight 76 Kg/ m^2,	66 Kg
Waist Circumferences 101Cm	95 Cm

Limitations and Further Recommendations

This study was limited to 3 months period, further studies of larger sample size and longer follow up period with other parameters such as lipid profile are recommended.

Discussion

Insulin usage in NIDDM is associated with older age, duration of diabetes and greater hyper glycemia (Abraira and Maki 1995). Intensive insulin management of NIDDM is the possible need for very high dosages with resulting weight gain and increased peripheral insulin resistance which in turn could lead to even higher insulin dosages (Chait 1993). Insulin therapy in NIDDM is controversial with few studies indicating benefit (Taskinen etal 1988) others suggest that such treatment may worsen obesity (Henry etal 1993) or be associated with dyslipidemia hypertension (Lands Berg 1987). Insulin treatment may correlate with adverse outcomes (Manson etal 1991). This subject with 3 months of RET with an improved blood glucose profile and drop in obesity paves the way for reducing the dose of insulin by the physician.

Ishi etal 1998 among moderately obese diabetic subject have shown with RET decline of Hba_1c from 9.6 to 7.6% in a 4-6 weeks study. This case study subject who is getting treated with insulin in 12 weeks of RET, hba_1c has reduced by 1.9% is similar to the findings of the above stated study. Thus if this sustained glycemic control with diet and RET, continued in future with the guidance of her diabetologist, a ray of hope that the subject can be treated without insulin therapy, but with diabetic tablets alone are possible.

With excess overall adiposity, in particular abdominal adiposity, excess truncal subcutaneous adipose tissue and low skeletal mass have been considered as possible determined of IR in Asian Indians (Misra etal 2007). With diet and exercises, weight loss of 9-13.6 kg after 20 weeks among type II diabetic mellitus was recorded (Wing etal 2002). Results of this case study subject as shown in table 1, where along with diet and RET weight loss of 10 kg was recorded along with 6cm reduction in waist circumference.

ACSM now recommends resistance training be included in exercises for type II diabetic mellitus as with increased age, there is a tendency to progressive declines in muscle mass leading to sarcopenia and decreased functional capacity and an increased adiposity and insulin resistance, with RET having major positive impact on these (ACSM 1998). RET improves bone density, muscle mass, strength, balance and over all

capacity for physical activity and potentially important for prevention of osteoporosis (Evans etal 2005).

Conclusion

Lowering of obesity, an improved quality of life with reduction of musculoskeletal ailments along with better blood glucose profile remains a big boon to this subject on insulin therapy, apart from improving her confidence for continued faith in comprehensive diabetic care with diet and exercises.

Acknowledgment

- Chennai Geriatrics Centre, No.32, II nd Main Road, Kasthuribai Nagar, Chennai-600020.
- Sree Balaji College of Physiotherapy, Velachery Main Road, Narayanapuram, Chennai-600100.

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