

Effects of Physioball Exercises on Glycemic Control and Quality Life of Type II Diabetic Patients

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An increase in Type II diabetes in Tamil Nadu state in India This research study aims to analyse the impact of Physioball exercises on glycemic control and quality of life among male Type II diabetic patients. Experimental with a sample size of 100 male Type II diabetic randomly allotted in two groups at Sree Balaji College of Physiotherapy, Chennai – 600 100 from October 2012 to December 2012. Experimental group have performed specific exercises using Physioball, while all the subjects have continued diabetic Medication pre and post HbA_{1c} and quality of questionere were analysed after 12 weeks completion. Indicated 6% decrease in mean HbA_{1c} and improved quality of life by 13% among subjects who have done exercises using Physioball

Key words: Physioball – an inflatable ball of size varying 55 cm to 65 cm, NCD – Non communicable diseases, HbA_{1c} – Glycocolated haemoglobin, ADA – American Diabetic Association.

In India an increase in the consumption of alcohol by 30% in 2011 than previous year, an increase in tobacco consumption (India ranks second globally) and an increase in obese population (LANCET 2010) the magnitude of the economic challenges India could lose due to Non communicable diseases including diabetes mellitus in the next decade will be two hundred and thirty seven billion united states dollars (\$237 Billion) (Sanjay Kinra 2010) prevalence of diabetic population in Tamil Nadu is at 10.4 % and Chennai having 18% as diabetic (Anjana etal 2001).ADA 2002 recommends 150 minutes of moderate Aerobic exercises per week for Type II diabetic patients. Vibration exercises are effective

in achieving a better glycemic control among Type II diabetic patients (Klaus etal 2007) glycaemic control improves with stability ball exercises among Type II diabetes mellitus (Subramanian and Venkatesan 2012). The importance of under standing and full filling the priorities of the patient's quality of life is paramount (fanci etal 2010). Restoration of function with adequate rehabilitation services does not necessarily imply a significant improvement in quality of life (verville 1990)

Study design

100 male Type II diabetic patients between the age group of 30-60 Years were selected from special diabetic camp. The participants were randomly allotted in two groups of 50 each. Group I forms the control group (n=50) and group II forms the experimental group (n=50). This research study was conducted at Sree Balaji College of Physiotherapy, Chennai 600100, during the period from October 2012 to December 2012

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ethical committee approval was obtained for this research study and all the subjects were informed and their due consent obtained.

Inclusion criteria

Male Type II diabetic, diagnosed type II diabetic on due medication

Exclusion criteria

Female diabetic patients, haemodynamically unstable type II diabetic, bed ridden type II diabetic.

Procedure

Baseline habits such as smoking, alcoholism were recorded. Fasting venous samples of all the subjects for HbA_{1c} and subjective information from 14 items pertaining to quality of life questionnaire on a 7 points scale before and after the study were recorded.

Methology

While all the subjects continued their day to day physical routines along with their prescribed diabetic medication, group II subjects have performed ten specific exercises to both lower extremities using physioball weekly thrice under

the supervision of physiotherapist. Progression was made as per the guidelines of ADA and ACSM 2002.

RESULTS

After twelve weeks of duration of the study all the participants HbA_{1c} and subjective information of all the participants from 14 items pertaining to quality life questioners on a 7 point scale were estimated and recorded. Few hypoglycemic incidents were reported and was duly treated by medical means. All the subjects have completed the study.

Table 1. Showing results of habits of the participants on smoking, Alcoholism

S. No.	Habits	Percentage
1.	Smokers	43
2.	Non Smokers	57
3.	Alcoholics	53
4.	Non Alcoholic	47

Table 2. Showing results of pre and post mean values and test of significance of group I and II on HbA_{1c}

Group	Mean	Result	SE	Level of significance
I	Pre 7.72 Post 8	↑ By.28 %	.04	P>.1
II	Pre 8.02 Post 7.45	↓ By .6%	.18	P<.001

Table 3. Showing the results of overall subjective scores on quality of life by all the participants before and after study from 14 point questionnaire

Overall Percentage of subjective scores on 14 items of quality of life questionnaire	Group I%	Group II%
Pre test	50	51
Post test	47	64
Result	↓-3%	↑13%

DISCUSSION

6% reduction in mean HbA_{1c} among Physioball exercise subjects is a major outcome of this research which is supported by other researchers with a reduction in HbA_{1c} by .43(Ronald *et al* 2007) and a decrease in HbA_{1c} by .6% among

Type 2 diabetic patients (Loimala *et al* 2009) 1% decrement on HbA_{1c} reduces the risk of diabetic complications such as myocardial ischemia among Type II Diabetes (Strattan *et al.*, 2006). Reduces the risk of developing microvascular disease (Patel *et al.*, 2008). The improved glycemic control could be due to improved effects on glucose transporters

(Good year 1991) lowering of inflammatory cytokines and markers of oxidative stress (Eissenstein *et al.*, 2002) and muscle hypertrophy (Dunsten *et al.*, 2002). As reported (Yac *et al.*, 2006) that obese with diabetes diminishes quality of life and considerable burden on health care system (Bijan 2011) also (Lindgreen *et al.*, 2007) a reduction of cardiovascular risk factors, cost effective and improved individual well being following supervised resisted exercises. As Physioball exercises involve dynamic muscle loading (from body weight) causing muscle contractions helps to increase muscle strength, power and endurance, hence an improved well beingness (Levangie and Norkin 2001). The effect of Physioball exercise on improving quality of life by 13% among Type II diabetes is a major finding of this study. This positive effect on improving subjective quality of life includes 14 items including their feelings on personal life, feeling on their role, their ability to handle stress in life, self esteem their level of self confidence, outcome of a therapeutic intervention should not only rely on clinical indicator but also on the impact of the subjective evaluation of his physical health mental well being and his quality of life (Führer 1987). **CONCLUSION:** An improved glycemic control and quality of life with the impact of physioball exercises among male type II diabetic patients as an outcome of this research study is a worthy indicator of a new physical modality to be deployed in the overall diabetic care. Further studies on female Type II diabetic male geriatric Type II diabetic, using other physical modalities to have larger sample size, add lipid profile and a longer duration of research.

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