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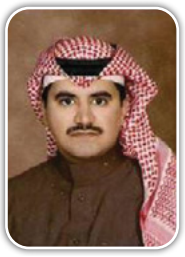

The impact of a combined aerobic and resistance exercise programme in preventing or delay to the onset of diabetes for subjects at risk

Bandar Alharbi

Prince Sultan Military Medical City, Saudi Arabia

Abstract

Introduction: Pre-diabetes describes a condition whereby an individual's level of blood glucose is above normal level, though not high enough to warrant them a T2D diagnosis. The condition is classified into two categories: Impaired Glucose Tolerance (IGT), the other is Impaired Fasting Glucose (IFG). Physical exercise improves BG homeostasis but the extent to which exercise is effective strategy as primary prevention mechanism for people whom at risk to develop diabetes is not fully understood.

Purpose: To examine the effects of 6weeks moderate-intensity combined aerobic and resistance exercise programme in preventing or delaying the onset of diabetes for subjects at risk compared to sedentary non-diabetic individuals.

Methods: 30 subjects of a sedentary lifestyle, diagnosed with either pre-diabetes or at risk to developed T2D and 10 Subjects were sedentary healthy individuals (ND) met the inclusion criteria. The 30 subjects were further divided into two groups: pre-diabetes group (Pre-D) consist of 19 subject and control group (CG) consisted of 11 subjects. Both Pre-D and ND have been asked to complete 6-weeks of moderate-intensity combined aerobic and resistance exercise for 60 minutes on two days/week. Each exercise session consists of a combined exercise protocol of 30 minutes of resistance exercise (3 sets of 10 repetitions) followed by 20 min cycling while the CG remain untrained.

Results: There were significant reductions (P = 0.00) on the HbA1c after applying the 6 weeks' combination exercise intervention in Pre-D and ND groups compared to pre-exercise while CG exhibited slight increase. OGTT indicated significant differences between pre-exercise & post 12th exercise session in both groups (P = 0.01). In addition, significant reduction was observed in AUC and HOMA-IR among Pre-D group. The result exhibited a significant reduction (P = 0.01) on HR among Pre-D group at resisting time, when compared pre-ex to post S12. A significant reduction in RPE have been achieved with (P = 0.00) in pre-D and (P = 0.03) in ND group.1RM improved significant in back (P = 0.04) and triceps (P = 0.04) in pre-D, while in ND group the significant improvement was in squat (P = 0.02) and back (P = 0.02). With regarding to the second aim, the study has a pivotal role as anti-inflammatory agent among pre-D. Interestingly IL-6 increased significantly (P = 0.04) in response to the acute exercise while the chronic exercise non-significantly (P = 0.68) reduced its concentration.

Conclusion: A combination exercise programme, which involves both RE, and AE performed at moderate intensity (50 – 60 % of 1RM) over 6-weeks period can be feasible and economical prevention strategies to minimize the risk factors for T2D in subjects at risk. The current approach is characterized by its low-cost, low-risk and non-surgical or pharmacological treatments and can be suggested to apply in hospital scale as diabetes fitness clinic.

Biography

Bandar Alharbi completed his Master of Science with merit pharmaceutical quality by design. Currently his research is in diabetes at pharmacy school and he is working as Assistant Director of Pharmacy for Material Management Prince Sultan Military Medical City, Saudi Arabia.

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