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What effect does 6 weeks of moderate-intensity combined aerobic and resistance exercise have on the inflammatory nature of prediabetes subject?

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Introduction: Type-2 diabetes is a long-term metabolic disorder that considered as a disease of adulthood. It is often progression in different phases from normoglycemia phase to pre-diabetes phase and then incident T2D. In additions immune response involved in each phase of type-2 diabetes (T2D) development consider to be different. Physical exercise known to be effective strategy as primary prevention mechanism for people whom at risk to develop diabetes. However, the extent to which exercise has effect on the nature of immune response during pre-diabetes phase not fully understood.

Purpose: The aim is to investigate what effect 6 weeks of moderate-intensity combined aerobic and resistance exercise has on the inflammatory nature of pre-diabetes subjects.

Methods: Three groups of volunteers were involved in this study: ND, PRE-d and control. The ND and PRE-D volunteers participated in the main exercise trial which was a combined exercise session involving stretches, warm up on the bike for 10 min followed by 35 min of RE at 50-60% of 1RM. After RE they had 5 min of rest followed by 20 min of AE (cycling) at 50-60% of HRR and finally 10 min cooling down involves stretches. The exercise program involved 2 sessions (48 hours apart) for a total of 150 min each week for a 6-week period. Venous blood samples were collected from the volunteers in EDTA tubes. All blood samples were centrifuged at 3000 rpm for 15 min at 4 °C and stored in a -80 °C freezer until analysis by Randox machine. The primary outcome is to concentrate on metabolic results, such as improved HbA1c, blood pressure and improvements in insulin sensitivity determined by responses to oral glucose tolerance tests on independent days. The secondary outcome is change in serum level of inflammatory markers such interleukin 6 (IL-6), TNF-alpha, CRP and adiponectin.

Results: There were significant reduction ($p=0.00$) on the HbA1c after applying of 6 weeks' combination exercise intervention in both groups comparing to baseline. OGTT indicated significant differences between Pre Exercise and Post 12th exercise session in both groups with $p=0.01$. BG concentrations were reduced post each exercise session and was significant Post-EX S12 comparing PRE-EX to $P=0.00$ and $P=0.09$ in PRE-D and ND, respectively. SBP drops from 127.3 ± 13.1 to 119.6 ± 8.4 mmHg with $P=0.04$ in PRE-D while in ND was not significant. HR was significantly reduced ($P=0.01$) and goes from 73.5 ± 10.3 to 70.3 ± 12.1 in PRE-D and was significantly reduced ($P=0.03$). A significant improvement in interleukin 6, have been achieved with $P=0.00$ in PRE-D and wasn't significant in ND group $P=0.25$. TNF-alpha no significant change has been achieved in all groups, while a significant improvement in adiponectin concentration PRE-D compare to ND and control groups.

Conclusion: A combination exercise programs, which involves both RE and AE performed at moderate intensity (50-60% of 1RM) over 6-weeks period can improve overall inflammatory marker nature during pre-diabetes phase.

Biography

Bandar Manawer al Harbi has completed his Master of Science with Merit Pharmaceutical Quality by Design. Currently he is the Researcher in diabetes at DMU University, Pharmacy School and working as an Assistant Director of Pharmacy for Material Management Prince Sultan Military Medical City.

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