

عنوان مقاله:

Effect of two Exercise Training Protocols on miR-133a and Runx2 in High-Fat Diet and Streptozotocin-induced Diabetes

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خلاصه مقاله:

Background: Type 2 Diabetes (T2D) in the elderly is an epidemic that significantly impacts global health. This experimental study aimed to compare the responses of microRNA-133a (miR-133a) in different tissues and of Runx2-related transcription factor 2 (Runx2) in bone marrow tissue following resistance and endurance training in old rats with High-Fat Diet and Streptozotocin (HFD/STZ)- induced type 2 diabetes. Materials and Methods: T2D was induced by HFD/low-dose STZ in 30 male Wistar rats (21-monthold, Mean±SD weight 418±43 g). The rats received HFD (55%, 31%, and 14% of energy from fat, carbohydrate, and protein, respectively; 5.2 kcal/g). The diets continued for eight weeks in both groups. Over week four, the rats in the group with HFD/STZ-induced T2D received treatment with low-dose STZ. After one week of familiarity with the laboratory environment, they were randomly divided into three groups: Diabetic Endurance Training (DET, n=10), Diabetic Resistance Training (DRT, n=10), and Diabetic Control (DC, n=10). The eight weeks of endurance training protocol comprised five sessions of moderate-intensity training (60%-75% velocity at maximal oxygen uptake (vVO2max) and low intensity (30%-35% vVO2max). In 60% Maximum Voluntary Carrying Capacity (MVCC), the resistance group climbed the ladder 14-20 times with 1-minute rest, five days a week. Results: The results of the 1-way ANOVA test showed no significant change in serum miR-133 expression (P=0.41) and muscle tissue (P=0.077) following resistance and endurance training. However, significant differences were observed in bone marrow miR-133 expression (P=0.003) and Runx2 gene expression (P=0.002) between groups. Tukey's post hoc tests showed that the bone marrow miR-133 expression had a significant increase following eight weeks of resistance training compared to the endurance training (P=0.006) and control (P=0.002) groups, and bone marrow Runx2 gene expression in rats exposed to resistance training compared to the endurance training (P=0.044) and the control (P=0.018) groups. Conclusion: It seems that longer periods of exercise are required for cellular changes in the metabolism of these tissues after these exercise protocols. This topic should be studied in future research

کلمات کلیدی:

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