

Physical Exercise Improves Heart Rate Variability in Patients with Type 2 Diabetes: A Systematic Review

Villafaina S.

Collado-Mateo D.

Fuentes J.P.

Merellano-Navarro E.

Gusi N.

Purpose of Review: The aim of the present systematic review is to provide an up-to-date analysis of the research on the effects of exercise programs on heart rate variability (HRV) in individuals with type 2 diabetes mellitus (T2DM). An electronic search of the literature (PubMed, PEDro and Web of Science) was performed. ?HRV?, ?heart rate variability?, ?exercise?, ?physical? and ?diabetes? were the terms used for article retrieval. Lastly, 15 articles were selected. PRISMA methodology was employed and data were extracted according to the PICOS approach. **Recent Findings:**

Although HRV is not routinely measured in the management of T2DM, it is an important measure due to its relation with mortality and diabetic neuropathy. Physical exercise has become a therapy for T2DM, because it improves physical fitness and functional capacity, enhances metabolic control and insulin sensitivity, reduces inflammatory markers and neuropathy symptoms and can increase the regenerative capacity of cutaneous axons, slowing or preventing neuropathy progression. However, it is not clear to what extent physical exercise can improve HRV in this population.

Summary: Participation in the 15 selected studies was similar in men and women (48.01% men and 51.99% women). All the intervention programs included aerobic training, and it was complemented by strength training in four studies. Duration of physical exercise sessions ranged between 30 and 75 min, the frequency being between 2 and 7 days/week. Statistically significant improvements in groups with diabetes, relative to baseline, were observed in nine studies. More than 3 days per week of aerobic training, complemented by strength training, during at least 3 months seems to improve HRV in T2DM. Weekly frequency might be the most important factor to improve HRV.

These aspects could help to design better programs based in scientific evidence, incorporating HRV as an important variable associated with diabetic neuropathy and mortality. © 2017, Springer Science+Business Media, LLC.

Autonomic function

Heart rate variability

Physical exercise

Type 2 diabetes

aerobic exercise

bicycle ergometry

cycling

diabetic neuropathy

exercise

fitness

functional status

heart rate variability

human

inflammation

insulin sensitivity

metabolic regulation

mortality

nerve fiber regeneration

non insulin dependent diabetes mellitus

resistance training

Review

running

systematic review

therapy effect

walking

complication

female

heart rate

male

meta analysis

non insulin dependent diabetes mellitus

outcome assessment

pathophysiology

physiology

Diabetes Mellitus, Type 2

Exercise

Female

Heart Rate

Humans

Male

Outcome Assessment (Health Care)

Physical Fitness