
Exercise and type 2 diabetes

OPINIONS

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We should put more emphasis on physical activity as cardioprotective treatment.

Regular physical exercise provides wide-ranging benefits and affects virtually all of the body's organ systems [\(1\)](#). Exercise is therefore an excellent form of preventive medicine. Persons with type 2 diabetes are less physically active than the population in general. Among those who *are* active, the risk of death from cardiovascular diseases is the same as for inactive persons without diabetes [\(2\)](#). The European Association of Preventive Cardiology (EAPC) has recently published two position papers on exercise and type 2 diabetes. The first of these papers describes the mechanisms by which exercise affects various systems in the body [\(3\)](#). The second paper has a clinical focus and describes outcome targets that are especially relevant for this patient group, the kinds of exercise they should choose, individual responses to exercise and barriers that cause patients to refrain from exercising [\(4\)](#). We believe that these articles can serve as a good guide for those who wish to use exercise more actively in the treatment of diabetes.

What is the goal of the exercise training?

Because of the strong association between fitness and survival, increased cardiorespiratory capacity (fitness) should be a primary objective for exercise training for these patients (5). To measure the effect of the training, describe the exercise intensity and assess risk, it is recommended to test the patient's fitness, ideally by testing maximum oxygen uptake. Simple tests of physical function (such as the six minute walking test, stair stepping or the time needed for a given distance) can be registered in most clinical practices. In addition to endurance testing, the most important clinically feasible measures of effect include glycaemic control, lipidemia and blood pressure. Body composition, measured as waist circumference, is regarded as a better measure than body mass. Perhaps counterintuitively, body mass is only recommended as a relevant outcome measure for persons with morbid obesity, or if other reasons indicate that weight loss would be beneficial for the treatment process (4).

«Exercise should be regarded as a necessary supplement, and occasionally as an alternative, to drug-based treatment»

Persons with type 2 diabetes will often suffer from dysregulation of a number of cardiovascular and metabolic functions. These include reduced glycaemic control, dyslipidemia, obesity, hypertension and reduced physical fitness. Exercise has a positive effect on all these functions.

How should the patients exercise?

Endurance and resistance training have both been shown to have a good effect on a number of relevant outcomes for this patient group. The combination of resistance and endurance training shows a somewhat better effect than the isolated effects of these two forms of training for glycaemic control, body composition and inflammation (4). There are also indications that high-intensity interval training is more effective than exercise at a moderate intensity when it comes to improving fitness (4).

«Too little attention is paid to physical activity and physical fitness in the examination and follow-up of patients»

Suggested exercise regimens for persons with type 2 diabetes are not different from the general recommendations for physical activity for healthy adults. However, the training programme must be individually adapted, and risk factors, comorbidity and personal preferences and wishes must be considered. It has been shown that solely providing advice on physical activity does not have the same effect on glycaemic control as structured, supervised training programmes (6). A certain follow-up of the patients' training and response is therefore required.

Challenges

The main challenge for all exercise intervention is adherence to and maintenance of the activity. It is therefore important to establish methods to increase the patients' motivation. This can best be ensured through interdisciplinary collaboration that includes medical doctors, physiotherapists, sports physiologists and other relevant professionals with knowledge of how to change behaviour. Local authorities and the individual therapist have a shared responsibility for undertaking such follow-up.

In our opinion, too little attention is being paid to physical activity and physical fitness in the examination and follow-up of patients, in the primary as well as in the specialist healthcare services. Physical activity and fitness should be included in the clinical assessment of patients on a par with other patient characteristics and entered in the patient records, especially for persons with type 2 diabetes and cardiovascular diseases (7). For these individuals, the effect is so good that exercise should be regarded as a necessary supplement, and occasionally as an alternative, to drug-based treatment. To date, the combination of medication and exercise has not been widely studied.

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