

Diabetes Mellitus and Exercise

Physical activity has important physiological and psychological benefits for all people, and an exercise program has a key role in the management of diabetes. This position statement presents exercise recommendations for people with insulin-dependent (IDDM) or non-insulin-dependent (NIDDM) diabetes mellitus.

EXERCISE AND IDDM

Exercise programs have not been exclusively shown to improve glycemic control in people with IDDM. However, IDDM individuals should be encouraged to exercise because of the potential to improve cardiovascular fitness and psychological well-being and for social interaction and recreation. Participation in competitive sports is also possible if desired. Therefore, safe participation in all forms of exercise, consistent with an individual's life-style, should be a primary goal for people with IDDM. However, physical exercise is not without risks to IDDM individuals. Hypoglycemia, hyperglycemia, ketosis, cardiovascular ischemia and arrhythmia, exacerbation of proliferative retinopathy, and lower-extremity injury are significant potential complications of exercise.

Many variables, including fitness, duration and intensity of exercise, and time of exercise regarding insulin administration and meals will affect the metabolic response to exercise. Thus, a uniform recommendation for preventing hypoglycemia and improving the metabolic response to exercise cannot be made. Rather, self-monitoring of blood glucose should be incorporated into the exercise program to provide the glycemic informa-

tion necessary to adjust the patient's diet or insulin dosage.

EXERCISE AND NIDDM

An appropriate exercise program should be an adjunct to diet and/or drug therapy to improve glycemic control, reduce certain cardiovascular risk factors, and increase psychological well-being in individuals with NIDDM. Patients who are most likely to respond favorably are those with mildly to moderately impaired glucose tolerance and hyperinsulinemia. This recommendation is based on the premise that the benefits of exercise outweigh the risks. However, attention must be paid to minimizing potential exercise complications.

NIDDM individuals who are about to start an exercise program should have a preexercise evaluation specifically designed to uncover previously undiagnosed hypertension, neuropathy, retinopathy, nephropathy, and, particularly, silent ischemic heart disease. An exercise-stress electrocardiogram is recommended in all subjects >35 yr old. People taking oral medications or insulin should self-monitor their glycemic response to exercise.

To improve glycemic control and diminish cardiovascular risk factors, an exercise program for patients with NIDDM should 1) include aerobic exercise at 50–70% of an individual's maximum O_2 uptake, 2) last 20–45 min and be repeated at least 3 days/wk, 3) include low-intensity warm-up and cool-down exercises, and 4) be appropriate to the person's general physical condition and life-style. Further information on exercise regimens and NIDDM is provided in the technical review on exercise and NIDDM (this issue, p. 785).

GENERAL GUIDELINES

All people with diabetes should be advised to comply with the following guidelines: 1) use proper footwear and, if appropriate, other protective equipment; 2) avoid exercise in extreme heat or cold; 3) inspect feet daily

and after exercise; and 4) avoid exercise during periods of poor metabolic control.

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