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Prescribing exercise for diabetes

Regular physical activity has been shown to significantly improve the health outcomes for people with diabetes. Physically active patients with diabetes have lower rates of all cause mortality and cardiovascular heart disease. Regular exercise assists in maintaining good blood glucose control, which in turn helps to decrease the risk of developing diabetes complications such as neuropathy and nephropathy. It can also enhance quality of life and reduce stress, anxiety and depression.

Prescribing exercise should be considered one of the essential components of diabetes care. Unfortunately, it is still largely underused.

Certain exercise intensities and modalities may be contraindicated or inappropriate for some people. Before prescribing an exercise program for a person with diabetes it is imperative that the patient is screened and assessed for cardiovascular disease risk factors or other conditions that may pose significant health risks. The patient should be asked about any symptoms of cardiovascular disease including unusual shortness of breath, chest pain with exertion, dizziness, light-headedness, swelling of the ankles and pain in the calves that is not associated with muscle pain. If these symptoms are present, further investigation is needed before the patient can begin an exercise routine. Other cardiovascular risk factors that should be assessed include blood pressure, cholesterol and lipid profiles, resting heart rate, weight, body mass index, waist circumference, family history and previous cardiac history.

The presence of cardiovascular risk factors and other complications does not preclude a person with diabetes from undertaking an exercise program. Screening provides a useful risk stratification tool to guide exercise prescription or identify those who should undergo cardiac stress testing before starting to exercise. Currently there are no clear cut guidelines.

Stress testing allows definitive management of patients with cardiovascular disease before exercise is prescribed. However, there is no evidence that stress testing should be routinely performed before exercise of moderate intensity if cardiovascular disease risk is low. Stress testing may be impractical and expensive.

Other conditions that should be screened for include proliferative and non-proliferative retinopathy, peripheral

neuropathy, autonomic neuropathy, nephropathy and microalbuminuria as well as musculoskeletal limitations such as rheumatoid arthritis, severe osteoarthritis, osteoporosis and other joint problems.

High intensity exercise is contraindicated in people with proliferate retinopathy due to the risk of retinal haemorrhage. High intensity exercise, while not contraindicated, is not recommended for people with nephropathy and microalbuminuria. High impact and weight-bearing modalities such as running and jumping are inappropriate and not recommended for people with peripheral neuropathy, arthritis and osteoporosis as they are at greater risk of falls, injuries and foot damage due to poor peripheral sensation.

Regular aerobic exercise improves blood lipid profiles, blood pressure and resting heart rates, body composition and glycaemic control as well as reducing cholesterol. In addition, it helps patient to lose weight.

For health benefits, current guidelines recommend that aerobic activity should be performed for at least 30 minutes at a moderate intensity on most, if not all days of the week with no more than 72 hours between exercise sessions. If weight loss is desired, then 60 minutes of exercise or more is recommended. It is often difficult for most people to begin at this level, therefore the exercise prescription should initally begin at a level the patient can mange, with the aim of gradually increasing exercise duration and intensity as the patient progresses.

Exercise should be continuous in nature and could include activities such as walking, swimming or cycling. However, the type of exercise will depend on the patient's safety and physical activity preferences.
The effects of exercise on patients who are insulin dependent, taking oral medications or suffering from one of the many comorbid conditions associated with diabetes also need to be considered when prescribing exercise.

Exercise has an insulin-type effect which poses potential hazards for those who are insulin dependent or take oral hypoglycemic medications. Exercise can cause hypoglycemia if medication dosages or carbohydrate intake are not modified with increases in levels of physical activity. Blood glucose levels will respond differently depending on the individual, exercise intensity and duration.As a general rule though, extra carbohydrate should be ingested before exercise if the session is to last longer than 30 minutes or if pre- exercise blood glucose levels are less than 5.6 mmol/L. As exercise-induced hypoglycaemia may occur many hours post exercise, regular blood glucose monitoring before, during and after exercise is recommended to establish blood glucose responses to exercise. Alternatively, insulin dosage may be adjusted.

The presence of diabetic retinopathy may also impact on exercise prescription. Exercise may have adverse effects on those with proliferative or severe non-proliferative retinopathy. Until the retinopathy has been stabilized, high intensity resistance and aerobic training should be avoided due to the risk of retinal haemorrhaging. Nevertheless, patients with either of these conditions can still benefit from regular moderate exercise.

Both peripheral neuropathy and vascular disease can increase the risk of injury and infection in the feet. Peripheral neuropathy can also affect balance, placing the patient at greater risk of falls. Some types of exercise such as treadmill walking should be avoided. Adequate footwear and regular screening for blisters is a must for these individuals, especially with weightbearing activities. Non- weight-bearing exercises such as

cycling, and upper limb resistance training may minimize damage or infection.

Conclusion

Exercise can play a major role in prevention and management of diabetes. It can improve glycaemic control, reduce cardiovascular risk and improve quality of life. Both aerobic and resistance training modalities should form the cornerstone of any exercise program. Prescribed correctly and with adequate considerations of the barriers, motivators and medical concerns facing people with diabetes, exercise can be an extremely safe and effective treatment strategy.

References

1. Bronwyn Penny, Australian Prescriber, Volume 30, No. 5, Oct 2007, Page 130 - 132
2. Di Loreto C, Fanelli C, Lucidi P, Murdolo G, De Cicco A, Parlanti N, et al. Make Your diabetic patients walk: long-term impact of different amounts of physical activity on type 2 diabetes. Diabetes Care 2005;28:1295-302
3. Dunstan DW, Daly RM, Owen N, Jolley D, De Courtern M, Shaw J, et al. High-intensity resistance training improves glycemic control in older patients with type 2 diabetes. Diabetes Care 2002;25:1729-39
4. Sigal RJ, Kenny GP, Wasserman DH, Castaneda-Sceppa C, White RD. Physical activity/exercise and type 2 diabetes: a consensus statement from the American Diabetes Association. Diabetes Care 2006;29:1433-8
5. Albright A, Franz M,Hornsby G, Kriska A, Marrero D, Ullrich l,et al. American College of Sports Medicine position stand. Exercise and type 2 diabetes. Med Sci Sports Exerc 2000;32:1345-60.
6. Cohen ST, Jacobson AM. Psychological benefits of exercise. In: Ruderman NB, Devlin JT, Schneider SH, Kriska A, editors. Handbook of exercise in diabetes. 2nd ed. Alexandria, VA: American Diabetes Association; 2002.
7. Gordon NF. The exercise prescription. In: Ruderman NB, Devlin JT, Schneider SH, Kriska A, editors. Handbook of exercise in diabetes. 2nd ed. Alexandria, VA: American Diabetes Association; 2002.

Brief Information

Antidepressants in pregnancy and breast-feeding

Depression in pregnant and lactating women is a common problem. In attempting to find the best treatment options for these women, doctors work with less knowledge and more risks than with other patients. Drug trials always exclude pregnant and lactating women and therefore practice is guided by data accumulated from clinical experience. Clinicians must consider the risk of damage from the medications and the effects of the illness itself on both the mother and the baby.

There is increasing evidence that antenatal and postnatal anxiety and depression potentially have enduring effects on offspring.

Although some studies differ, most document maternal antenatal depression as causing slightly shorter gestational length and lower birth weight in newborns.

The relationship between postnatal depression and breastfeeding is emerging as complex. Women who develop

postnatal depression are more likely to stop breastfeeding than women who are not depressed. Likewise, women who establish and maintain breastfeeding are less likely to develop depression than women who have difficulties with breastfeeding.

Experts differ in their assessments of the relative risks of the antidepressants, but in general, SSRIs are preferred to tricyclic antidepressants, combined serotonin and noradrenaline reuptake inhibitors and mirtazapine .Every antidepressant has been associated with some neonatal effects, and different studies show differing results. The data on paroxetine in higher doses cause concern. While some perinatal psychiatrists prefer fluoxetine with its longer half-life and potential for slower neonatal withdrawal effects, many prefer the shorter-acting SSRIs, either citalopram fluvoxamine or sertraline as the maternal response may be faster.

The risks of the depression and its consequences must be weighed against the risks of the medications to both mother and infant during the different phases of pregnancy and lactation. Careful history taking, close monitoring and good psychosocial care may be sufficient for many women with depression during pregnancy. When antidepressants are needed, the baby should be monitored postnatally for feeding, neurological and respiratory difficulties. Prescription of SSRIs postnatally appears less hazardous than in antenatal use, and potentially of benefit to mother and child.

Drug Monitoring and Toxicology Laboratory

The total number of patients who utilized the service from April 2007 to September 2007 was 276. The summary of samples received by this laboratory during six months period are as follows :

Drug/Enzymes	Ref. Value	Total Samples	Results within normal limits	Results beyond normal limits
Cholinesterase level	4,260-11250 units/litre	224	57	167
Paracetamol level	10-20 ìg/ml	52	18	34
Total sample		276		

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