



Clinical Issues in Hypertension

Canadian Coalition for High Blood Pressure Prevention and Control

Coalition Canadienne pour la Prévention et le Contrôle de l'Hypertension Artérielle

Physical Activity and Hypertension: What is the prescription?

By Robert J. Petrella, MD, PhD



Public interest in preventing and treating cardiovascular disease and promoting health has been highlighted by the World Health Organization (WHO).¹ In response, the WHO has promoted lifestyle modification as an effective method for reducing high blood pressure (BP) and overall cardiovascular risk. Promoting lifestyle modifications is not easy; it requires a two-pronged approach, targeting both the population overall, with a multidisciplinary strategy, and high-risk individuals with diagnosis, lifestyle tactics and drug treatment.² Community-based lifestyle intervention programs have been shown to be feasible and effective. The added value of these programs is that lifestyle change has multiple complementary effects on associated cardiovascular risk factors, including improving the efficacy of other therapeutic modalities.³ While the cost of lifestyle inter-



Dr. Petrella is associate professor, departments of family medicine and physical medicine & rehabilitation at the University of Western Ontario, and is secretary-treasurer of the Canadian Coalition for High Blood Pressure Prevention and Control.



Physical Activity Prescriptions

vention is small and the health cost impact considerable, much work is needed to overcome barriers to delivery and compliance with lifestyle modification strategies.⁴

Sedentary living (physical inactivity) is an independent risk factor for cardiovascular disease. Sedentary people have twice the risk for cardiovascular disease as active people. Having a sedentary lifestyle is as risky as smoking 20 cigarettes a day, having elevated cholesterol, or even mild high BP. In addition to being a proven strategy for preventing and treating hypertension, regular exercise can reduce other associated risk factors, such as diabetes mellitus and coronary artery disease; complement other lifestyle changes, such as losing weight and reducing alcohol and salt intake; and improve quality of life. The beneficial effects of exercise do not change with age, nor do they vary with patients' sex or race.

The effect of lifestyle interventions on BP control have shown greater general health benefits if several different interventions are combined. The Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure recommends that all patients be encouraged strongly to follow lifestyle modifications to lower BP and reduce overall risk of cardiovascular disease.⁵ Further, if no additional risk factors and no evidence of end-organ damage are found, lifestyle modifications may be continued for one

year before pharmacologic therapy must be instituted because of failed control.⁶

Dynamic Exercise

It is important to distinguish between the different forms of exercise. Dynamic, or isotonic, exercise involves the whole body, as in walking and running; static or isometric exercise consists of steady muscle resistance against a steady load, as with weight-lifting. There is no evidence that static or isometric exercise reduces BP, and patients with moderate or poorly controlled high BP should be monitored closely with this form of exercise. In contrast, many studies confirm that dynamic exercise is an effective BP-lowering strategy.⁷ When exercise is combined with other lifestyle and pharmacologic antihypertensive strategies, the effects are even greater, and the number of medications and dosage can often be reduced.



The Evidence

Despite widespread interest in lifestyle therapy for hypertension, exercise has not gained general acceptance for its antihypertensive effect.⁸ Although physical inactivity is associated with lower BP in observational studies, prospective trial results are varied.⁹⁻¹² Problems related to trial design, random allocation, use of appropriate controls and BP measurement are certainly partly responsible. This need clarification for the nature of the association to be understood.¹³



Table 1

Recommendations for Physical Training

Recommendation 1: People with mild hypertension should have 50 to 60 minutes of moderate dynamic exercise 3 to 4 times per week to lower blood pressure (Grade B).

Recommendation 2: People currently receiving pharmacologic therapy for hypertension should use exercise as an adjunctive therapy that might reduce the need for some medications (Grade B).

Adapted from Cleroux J, Feldman RD, Petrella RJ: Lifestyle modifications to prevent and control hypertension: recommendations on physical exercise training. CMAJ 1999; 160:S21-8.

The Prescription

As with aerobic fitness, exercise prescription for BP lowering is best described by the Frequency Intensity Time/duration Time/session (FITT) Principle.³ These recommendations are supported by the Canadian Guidelines summarized in Table 1.

Frequency: Exercise-induced antihypertensive effects are observed with only three exercise sessions per week and daily exercise adds only mild additional benefit.^{7,8} This follows the recommendations of Canada's Guide for Physical Activity that patients exercise three, and preferably all days of the week.

Intensity: Most studies have used a training intensity between 60-70% VO_2 max. When studies using low intensity were compared to those using higher intensity, BP reductions were similar.⁷ Hence, it appears that low intensity (*i.e.* 50-70% VO_2 max) is at least as effective as higher intensity.¹⁴ This is an important point when higher intensity may be more difficult to obtain optimal compliance.

Time/Duration: Most (approximately 75%) of the antihypertensive effect of exercise training effect is found after 20 weeks, but is statistically present as early as 10 weeks.¹⁵ This effect persists as long as the training program

duration¹¹ but is lost after 10 weeks of detraining. Hence, the antihypertensive effect of exercise is reversible.

Time/session: In general, studies have looked at 30 to 90 minutes of exercise per session.⁷ The greatest effect is found between 50 to 60 minutes per session, as compared to 30 to 45 minutes.⁸ Further, although general physical activity recommendations suggest that training can be accumulated throughout the day (*i.e.*, three 10-minute bouts vs. 30 continuous minutes), this has not been established in terms of antihypertensive effects.

How Much Effect Can We Expect?

Fagard (1995) found that dynamic exercise training was associated with a mean net change of systolic BP at -3 mmHg with normal average blood pressure, -6 mmHg in borderline hypertensive and -10 mmHg in hypertensive patients. The fact that BP lowering is more pronounced in hypertensive than normotensive patients is corroborated in a weighted average reduction of -13/-8 mmHg in hypertensive vs. -3/-2 mmHg in normotensive in several studies.^{16,17,18}



Physical Activity Prescriptions



Summary

Mild to moderate dynamic exercise (*i.e.*, walking and cycling) for 30 minutes daily, all at once or perhaps in 10-minute segments, on three or more days per week has more antihypertensive effect than more vigorous exercise. This level of activity is similar to that promoted by Canada's Physical Activity Guide to Healthy Active Living and the US Surgeon General's Report for general health benefit and should be encouraged for most patients. This type of exercise intervention has been BP reduction after as little as four to five weeks. The key benefits of exercise are long-term maintenance of health and prevention of sedentary relapse. As with other lifestyle interventions, counseling strategies aimed at behavioral change will be important areas for future research and for implementation into clinical practice.

Despite the limited time available to see patients in the office, physicians should resist the "quick fix" of prescribing medications first, and instead "prescribe" proven antihypertensive and health-promoting lifestyle changes. Certainly, high BP is only one of several risk factors for cardiovascular disease. The "risk" approach to treating high BP with lifestyle interventions complements other health-promoting activities. Family physicians need to develop effective strategies and behavior-change models to motivate and guide patients to change their behavior and to maintain the changes.

Professional and public education with the assistance and leadership of organizations, such as the Canadian Coalition for the Prevention and Control of High Blood Pressure, is essential. Efforts at lifestyle modification for hypertension are effective, complementary, and should be an effective tool for both patients and clinicians. *Read*

Physical Activity Prescriptions



References

1. World Health Organization: Hypertension control. report of a WHO expert committee. World Health Organization, Geneva, 1996.
2. Campbell NRC, Burgess E, Taylor G, et al: Lifestyle changes to prevent and control hypertension: do they work? A summary of the Canadian Consensus Conference. CMAJ 1999; 160:1341-3.
3. Petrella RJ: Lifestyle approaches to managing high blood pressure. Can Fam Phys 1999; 45:1750-5.
4. Berg AO: Behavioral counseling in primary care to promote physical activity. Recommendations and rationale. US Preventive Services Task Force. Ann Intern Med 2002; 137:205-7.
5. Kaplan NM: The sixth national joint committee report (JNC-6): New guidelines for hypertension therapy from the U.S.A.. Keio J Med 1998; 47(2):99-105.
6. Cleroux J, Feldman RD, Petrella RJ: Lifestyle modifications to prevent and control hypertension: recommendations on physical exercise training. CMAJ 1999; 160:S21-8.
7. Petrella RJ: How effective is exercise training for the treatment of hypertension? Critical Review. Clin J Sport Med 1998; 8:224-31.
8. Fagard RH: The role of exercise in blood pressure control: supportive evidence. J Hypertens 1995; 13:1223-7.
9. Kannel WB, Sorlie P: Some health benefits of physical activity: the Framingham study. Arch Intern Med 1979; 139:857-61.
10. Attina DA, Guiliano G, Arcangeli G: Effects of one year of physical training on borderline hypertension: an evaluation of bicycle ergometer testing. J Cardiovasc Pharmacol 1986; 8:S145-7.
11. Baglivo HP, Fabregues G, Burrieza H, et al: Effect of moderate physical training on left ventricular mass in mild hypertensive persons. Hypertension 1990 (Suppl 1):1153-6.
12. Berlin JA, Colditz, GA: A meta-analysis of physical activity in the prevention of coronary disease. Am J Epidemiol 1990; 132:612-28.
13. DePlaen JF, Detry JM: Hemodynamic effects of physical training in established hypertension. Acta Cardiol 1980; 35:179-88.
14. Marceau M, Kouame N, Lacourciere Y, et al: Effects of different training intensities on 24-hour blood pressure in hypertensive subjects. Circulation 1993; 88:2803-11.
15. Kiyonaga A, Arakawa K, Tanaka H, et al: Blood pressure and hormonal responses to aerobic exercise. Hypertension 1985; 7:125-31.
16. Bonnano JA, Lies JE: Effects of physical training on coronary risk factors. Am J Cardiol 1974; 33:760-4.
17. Boyer JL, Kasch FW: Exercise therapy in hypertensive men. JAMA 1970; 211:1668-71.
18. Cononie CC, Graves JE, Pollock ML, et al: Effect of exercise training on blood pressure in 70- to 79-year-old men and women. Med Sci Sports Exerc 1991; 23:505-11.

www.stacommunications.com

Back Forward Reload Home Search My Images Print Security Shop Stop

Location: www.stacommunications.com What's Related

WE'RE ON-LINE

The Canadian Journal of
CME
Continuing Medical Education
McGill University

The Canadian Journal of
Diagnosis
Memory Loss:
Alzheimer's &
Parkinson's
Disease

le
clinicien
L'équale diabétique:
une nouvelle approche

Cardiology
Cardiovascular
Diagnostics
Basis

www.stacommunications.com