Lifestyle Modifications to Prevent and Manage Hypertension for Exercise Physiologists and Fitness Professionals


Catalogue Data

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Abstract/Résumé
Information tailored to the interest of exercise physiologists and fitness professionals is provided regarding the Canadian Hypertension Society’s 2005 evidence-based recommendations on lifestyle modifications for the prevention and management of hypertension. The evidence from randomized controlled (RC) trials and systematic reviews of RC trials published in peer reviewed journals was reviewed by subject matter experts and then appraised independently by content and methodology experts. Blood pressure lowering was accepted as a primary outcome. All recommendations were debated and then voted on by the 43 members of the Canadian Hypertension Education Program’s Evidence-Based Recommendations Task Force and achieved at least 95% consensus. Lifestyle modifications to prevent and/or manage hypertension include: (1) perform 30–60 minutes of aerobic exercise on 4–
7 days of the week; (2) maintain a healthy body weight (BMI 18.5–24.9 kg/m²) and waist circumference (<102 cm for men and <88 cm for women); (3) limit alcohol consumption to no more than 14 standard drinks per week in men or 9 standard drinks per week in women; (4) follow a diet that emphasizes fruits, vegetables, and low-fat dairy products and which is reduced in fat and cholesterol (DASH diet); (5) restrict salt intake; and (6) consider stress management in selected individuals.

Introduction

Hypertension afflicts almost 25% of Canadian adults and leads to substantial increases in morbidity and mortality (Joffres et al., 1997). In a continuing effort to reduce the incidence and improve the care of persons with hypertension in Canada, the Canadian Hypertension Education Program (CHEP) sponsors annual evidence-based updates of recommendations for the prevention and management of hypertension (Zarnke et al., 2000). This discussion of the lifestyle interventions section of the CHEP recommendations has been tailored to meet the interests of exercise physiologists and fitness professionals. The complete CHEP recommendations have been published in the Canadian Journal of Cardiology and are available on the Canadian Hypertension Society website (www.hypertension.ca) along with a freely downloadable slide kit.

It is important that all Canadians know their blood pressure reading beginning at as early an age as practical. Trends in blood pressure alterations provide important information about changes in health risk. All Canadians should have their blood pressure measured at each visit to a health care worker, and when appropriate, by an allied health care practitioner such as an exercise physiologist or fitness professional (e.g., prior to a fitness assessment or annually when involved in a physical activity/exercise program). Accurate home measurement blood pressure equipment is also recommended.
Recommended Lifestyle Modifications to Prevent or Manage Hypertension

Lifestyle modifications can lower blood pressure (Appel, 2003; Appel et al., 2003), reduce the incidence of diabetes mellitus (Knowler et al., 2002), reduce lipid levels (Kemmler et al., 2004), and improve the quality of life (Koertge et al., 2003). Although the impact of these changes on mortality and cardiovascular morbidity have yet to be evaluated in clinical trials, comprehensive lifestyle modifications are known to reduce systolic blood pressure (SBP) by 5 mmHg, thereby reducing stroke mortality by 14%, coronary heart disease mortality by 9%, and all-cause mortality by 7% in the general population (Stamler et al., 1989; Whelton et al., 2002a). Lifestyle modification is indicated as a first-line treatment for the prevention and management of hypertension as well as an important adjunct to drug therapy. Importantly, even brief counseling that advocates these changes will increase the probability of a person implementing lifestyle modifications (Fleming et al., 1997).

PHYSICAL ACTIVITY/EXERCISE

For nonhypertensive individuals, to reduce their chances of becoming hypertensive, and also for hypertensive patients, to reduce their blood pressure: Prescribe the accumulation of 30 to 60 minutes of moderate-intensity dynamic exercise such as walking, jogging, cycling, or swimming 4–7 days a week. Higher intensities of exercise are not any more effective at reducing blood pressure.

Although the optimal frequency and duration of exercise is unclear, RC trial data showing blood pressure reductions generally studied 30 to 60 min of exercise per day (Fagard, 2001; Whelton et al., 2002b). Also, greater frequencies of exercise (i.e., 4 to 7 days per week) may produce a greater reduction in blood pressure (Jennings et al., 1986; Nelson et al., 1986; Whelton et al., 2002b) and aid in weight loss. Meta-analyses of RC trials confirm that dynamic exercise of moderate intensity such as walking, jogging, cycling, or swimming reduces resting blood pressure (up to 7.4/5.8 mmHg in hypertensives and 2.6/1.8 mmHg in nonhypertensives (Fagard, 2001; Halbert et al., 1997; Pescatello and Kulikowich, 2001; Whelton et al., 2002b)).

A recent meta analysis involving progressive resistance exercise (weight-lifting) found significant BP reductions of 3 mmHg (95% confidence interval −1 to −4 mmHg) for resting SBP and DBP in a largely nonhypertensive population (Kelley and Kelley, 2000). As few hypertensive individuals were studied, progressive resistance exercise cannot be routinely recommended for persons with hypertension, and theoretically the risks of large exercise-induced surges in blood pressure remain, particularly with improper resistance training techniques. It is also suggested that the type and safety of a given exercise regimen be evaluated for each person on an individual basis.

Note to Fitness Professionals. The physical activity recommendations for the prevention and management of hypertension are based on the specific activity regimens employed in RC trials in studies of BP. Hence they differ slightly from the “general” physical activity guidelines in Canada’s Physical Activity Guide to Healthy Active Living (Health Canada and Canadian Society for Exercise Physiol-
The general physical activity guidelines for health are: 60 minutes of light effort or 30–60 min of moderate effort on 4 to 7 (preferably 7) days of the week, or 20–30 min of vigorous effort 4 days a week. To date, however, not all of these physical activity regimens have been employed in RC trials in studies of BP.

**WEIGHT REDUCTION**

Height, weight, and waist circumference (WC) should be measured and body mass index (BMI) should be calculated for all adults.

Maintaining a healthy body weight (BMI 18.5–24.9 kg/m²; WC < 102 cm for men and < 88 cm for women) is recommended for nonhypertensive individuals to prevent hypertension, as well as for hypertensive persons to reduce blood pressure. All overweight hypertensive persons should be advised to lose weight.

Weight loss strategies should employ a multidisciplinary approach and include dietary education, increased physical activity, and behavioural modification.

Cross-sectional and cohort studies demonstrate that WC may more accurately reflect central adipose tissue stores and predict the presence of cardiovascular risk factors, even within normal ranges of BMI (Dalton et al., 2003; Foucan et al., 2002; Gus et al., 2004; Hayashi et al., 2003; Janssen et al., 2002; Sironi et al., 2004). In addition, within each BMI category for normal weight (18.5–24.9 kg/m²), overweight (25.0–29.9 kg/m²), and Class 1 obesity (30.0–34.9 kg/m²), a waist circumference greater than 102 cm (40 in.) in men and 88 cm (35 in.) in women is associated with a higher risk of hypertension (Janssen et al., 2002). Janssen et al. also suggest that a WC which is slightly lower than 102 cm and 88 cm could act as a warning threshold which would provide a more conservative approach to prevention.

Although slightly varying landmarks for measuring WC are reported, we recommend positioning the measuring tape horizontally, midway between the iliac crest and the bottom of the rib cage, at end-expiration while standing (Canadian Society for Exercise Physiology, 2003). A waist circumference of less than 88 cm (35 in.) in women and 102 cm (40 in.) in men should be maintained (NHLBI Obesity Education Initiative, 1998). Weight loss strategies utilizing a multidisciplinary approach including dietary education, increased physical activity, and behavioural modification are more likely to be successful (Miller et al., 2002; NHLBI Obesity Education Initiative, 1998).

**Note to Fitness Professionals.** These cutoffs for BMI and WC are consistent with the cutoffs employed in the assessment of healthy body composition in the Canadian Society for Exercise Physiology Health and Fitness Program’s Canadian Physical Activity Fitness and Lifestyle Approach (Canadian Society for Exercise Physiology, 2003).

**ALCOHOL CONSUMPTION**

To reduce blood pressure, alcohol consumption should be in accordance with Canadian low-risk drinking guidelines in both normotensive and hypertensive individuals: Healthy adults should limit alcohol consumption to ≤ 2 drinks per day, and consumption should not exceed 14 standard drinks per week for men and 9 standard drinks per week for women. (One drink is considered 13.6 g or 17.2 ml of ethanol, or approx. 1.5 oz of 80 proof [40%] spirits, 12 oz of 5% beer, or 12% wine.)
DIETARY RECOMMENDATIONS

It is recommended that hypertensive persons consume a diet that emphasizes fruits, vegetables, and low-fat dairy products and that is reduced in fat and cholesterol (Dietary Approaches to Stop Hypertension [DASH] Diet) (see Table 1).

SALT INTAKE

In normotensive individuals at increased risk of developing hypertension and considered salt-sensitive such as Canadians of African descent, age over 45 years, and individuals with chronic kidney disease or diabetes, salt intake should be restricted to less than 100 mmol/L per day (or 5,000 milligrams/day). In hypertensive patients, dietary sodium intake should be limited to less than 65 mmol/L per day (or 3,000 milligrams/day).

POTASSIUM, CALCIUM, AND MAGNESIUM SUPPLEMENTATION

Hypertensive patients or normotensive persons at increased risk of developing hypertension are considered salt-sensitive such as Canadians of African descent, or age over 45 years, or individuals with impaired renal function or diabetes should ensure an adequate intake of potassium, calcium, and magnesium by consuming a diet rich in these micronutrients.

Table 1  Dietary Approaches to Stop Hypertension (DASH) Diet*

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Daily Serving</th>
<th>Examples and Notes</th>
</tr>
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<tbody>
<tr>
<td>Grains</td>
<td>7–8</td>
<td>Whole wheat bread, oatmeal, popcorn</td>
</tr>
<tr>
<td>Vegetables</td>
<td>4–5</td>
<td>Tomatoes, potatoes, carrots, beans, peas, squash, spinach</td>
</tr>
<tr>
<td>Fruits</td>
<td>4–5</td>
<td>Apricots, bananas, grapes, oranges, grapefruit, melons</td>
</tr>
<tr>
<td>Low-fat or fat-free dairy foods</td>
<td>2–3</td>
<td>Fat-free (skim)/low-fat (1%) milk, fat-free/low-fat yogurt, fat-free/low-fat cheese</td>
</tr>
<tr>
<td>Meats, poultry, fish</td>
<td>≤ 2</td>
<td>Select only lean meats; Trim away fats; Broil, roast or boil; No frying; Remove skin from poultry</td>
</tr>
<tr>
<td>Nuts, seeds, dry beans</td>
<td>4–5/wk</td>
<td>Almonds, peanuts, walnuts, sunflower seeds, lentils</td>
</tr>
<tr>
<td>Fats and oils</td>
<td>2–3</td>
<td>Soft margarines, low-fat mayonnaise, vegetable oil (olive, corn, canola, or safflower)</td>
</tr>
<tr>
<td>Sweets</td>
<td>5/wk</td>
<td>Maple syrup, sugar, jelly, jam, hard candy, sorbet</td>
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* DASH eating plan available at www.nhlbi.nih.gov
Supplementation of potassium, calcium, and magnesium is not recommended for the prevention or treatment of hypertension. Individuals who require a diet rich in these cations, but who cannot tolerate or afford this diet, should supplement their diet with potassium to obtain a daily intake of more than 80 mmol per day.

STRESS MANAGEMENT

For hypertensive persons in whom stress may be implicated in contributing to elevated blood pressure, stress management should be considered as an intervention. Individualized cognitive behavioural interventions are more likely to be effective when relaxation techniques are employed.

SMOKING CESSATION

There is insufficient direct evidence from RC trials and systematic reviews for CHEP to establish evidence-based recommendations regarding smoking and hypertension. However, it has long been known that blood pressure increases during active smoking and with passive exposure to smoke (Leone, 2003; Omvik, 1996). Paradoxically though, early studies reported a slightly lower blood pressure among smokers than nonsmokers during office visits (Omvik, 1996). More recent studies involving ambulatory BP monitoring have reported that systolic and diastolic blood pressure is higher in smokers as well as those exposed to smoke (Goldman and Klinger, 2001); also, smoking decreases the efficacy of antihypertensive therapy (Goldman and Klinger, 2001; Pipe, 1996). Therefore all smokers, but particularly hypertensive smokers, should be advised to stop smoking.

Conclusion

Hypertension is an important public health concern in Canada. Exercise physiologists and fitness professionals can assist the efforts of the Canadian Hypertension Education Program in the prevention and management of hypertension by regularly assessing the blood pressure of participants in fitness assessments and physical activity programs, and by counseling clients about lifestyle modifications to lower their blood pressure. The promoting of regular physical activity and healthy body composition, and the stressing of a healthy lifestyle, will reduce health risks.

Acknowledgment


References


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