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M. Abdelbaki *

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Case Report

Physical Activity for Hypertensives

M. Abdelbaki [1]*, A.Boureghda [2]

[1] Laghouat mixed hospital.

[2] University hospital center.

***Corresponding Author:** M. Abdelbaki, Laghouat mixed hospital.

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Abstract

Hypertension and sport, far from being mutually exclusive, are complementary.

However, the right type of sport (preferably those involving endurance exercise) should be judiciously recommended for the right hypertensive (rather mild hypertensives without left ventricular hypertrophy).

As far as possible, the hypertensive subject should be discouraged from taking part in competitive and/or high-level sports.

Physical activity needs to be an integral part of prescribers' therapeutic decisions, and in particular of the dietary hygiene rules (weight loss, elimination of tobacco, reduction in fat intake) that need to be indicated to all hypertensives, whether or not they are sportsmen or women at the time of diagnosis of hypertension.

Keywords: hypertension; hypertensives; left ventricular hypertrophy

Introduction

Treatment of hypertension is the most common reason for office visits and for the use of chronic prescription medications [6-8]. In addition, roughly one-half of hypertensive individuals do not have adequate blood pressure control [9].

The health benefits of regular exercise are well established [9].

Because physical inactivity is a modifiable risk factor, clinicians should routinely assess and prescribe structured exercise and increased lifestyle activity to all patients [10].

Regular exercise is recommended for many purposes, including blood pressure lowering [1-5] and is considered as an integral part of life style and dietary rules for the treatment of hypertension.

The main aim of physical exercise is to reduce cardiovascular risk at a lower cost.

Different types of exercise:

An “active subject” can be quantified in terms of intensity and duration, but defining an "active" subject remains difficult.

At present, the accepted consensus for considering a person to be "physically active" at the minimum level is a brisk walk of at least 30 minutes a day, which is sufficient for cardiovascular protection.

The effects of physical activity are numerous. Several systems are involved: circulatory, respiratory, osteoarticular, endocrine, etc...

Physical activity is any sustained body movement that increases energy expenditure, such as walking, jogging, dancing, gardening, swimming, heavy physical labor, etc [11].

Exercise is a subcategory of physical activity that is planned, purposeful, and repeated on a regular basis in order to improve or maintain health and fitness [11,12].

Exercise may be divided into three major types, although these may overlap for a given activity, which entail different circulatory adaptations, they include:

- Dynamic aerobic exercise: The most extensively studied form of exercise is dynamic aerobic exercise, which is the regular and purposeful movement of large muscle groups in moderate and/or vigorous activity that places stress on the cardiovascular system. Examples include brisk walking, jogging, dancing, bicycling, swimming, and using certain exercise equipment, such as elliptical machines [13].
- Characterized by an increase in oxygen consumption (VO2) and cardiac output, and a decrease in peripheral resistance;
- Dynamic resistance exercise: This type of exercise is characterized by effort that is performed against an opposing force accompanied by purposeful movement of joints and large muscle groups. Common types of dynamic resistance exercise include weight lifting and circuit training, often with the use of exercise equipment. These types of exercise are typically performed with a goal of progressively increasing muscle strength [13].

- Isometric resistance exercise: characterized by sustained contraction of muscles with no change in the length of the involved muscle groups and no change in joint angle. Some isometric resistance exercise may involve equipment, such as handgrips or weighted resistance machines; other forms do not use equipment and involve maintaining a constant position such as sitting against a wall without a chair or maintaining a "plank" position [13].

Resistance exercises are Characterized by little increase in VO2 and cardiac output, and a significant raise in systolic and diastolic arterial pressures, without any change in peripheral arterial resistance.

Which physical activity for hypertensive patients:

Before making this choice, the physician must be aware of the constraints of each sport. He must take into account the static and dynamic aspects of each sport.

This is the only way to be able to advise patients for a specific activity.

The available evidence supports dynamic aerobic exercise as a means to lower blood pressure and prevent and control hypertension. The evidence supporting resistance exercise is less compelling [13].

Numerous studies, including clinical trials, have examined the effects of exercise

Aerobic, dynamic resistance and isometric resistance exercise can decrease systolic and diastolic pressure by, on average, 4 to 6 mmHg and 3 mmHg, respectively, independent of weight loss [9]

The American Heart Association affirmed these benefits in a 2021 scientific statement on the BP-lowering effects of aerobic and resistance training [13,14].

The mechanisms by which exercise lowers blood pressure and prevents hypertension are uncertain, in part because the etiology of elevated blood pressure is multifactorial. Findings from animal studies suggest aerobic exercise may prevent increases in blood pressure through beneficial changes in insulin sensitivity and autonomic nervous system function [15] while resistance training may prevent increases in blood pressure through reduced vasoconstriction [16]. Other potential mechanisms include reduced inflammation, oxidative damage, sodium sensitivity, and arterial stiffness [2], [13].

Dose and frequency of physical activity:

There is no one exercise prescription that is appropriate for all adults. The prescription should be individualized to the patient's capabilities and to prevent injuries and maximize incentives for maintaining a consistent regimen [13].

The main recommendations are to choose an activity where the intensity of effort does not exceed 70% of VO2 max, and to be aerobic: brisk walking, running, treadmill, cycling, swimming.

For hypertension, lower levels of exercise may be beneficial, such as normal walking, but this does not offer cardiovascular protection.

The goal of physical exercise for hypertensive patients is to expend 2,000 Kcal, which corresponds to 60 minutes of light activity or 20 to 30 minutes of intense activity.

Most studies demonstrating a reduction in blood pressure have employed at least three to four sessions per week of moderate-intensity aerobic exercise lasting approximately 40 minutes for a period of 12 weeks [9]. (Table 1)

Static exercise is not forbidden, but should be moderated, as it improves physical strength (preserves and maintains muscles) and aids dynamic exercise. We recommend weight training with a series of 5 to 10 repetitions of 8 to 10 different exercises, not exceeding an intensity of 50% of maximum strength, 2 times a week.

Light intensity 60 minutes	Medium intensity 30 to 45 minutes	High intensity 20 to 30 minutes
• A leisurely pace; • Light gardening andhousework; • Do stretching exercises.	• Walking at a good pace; • Go for a bike ride; • Gardening work thatrequires effort; • Swim or dance withoutforcing yourself; • Gymnastics at home; • Play tennis	• Working out in a gym; • Jogging; • Swim or dance at a steady pace; • Ride an exercise bike.

Exercise recommendations to lower blood pressure from professional committees and organizations

The FITT of the Ex R_x	Professional committee/organization					
	JNC 8[1] and AHA/ACC Lifestyle Work Group[2]	JNC 7[3]	AHA[4]	ACSM[5]	ESH/ESC[6]	CHEP[7]
Frequency (how often?)	3 to 4 sessions/week ≥12 weeks	Most days of the week	Most days of the week	Most, preferably all, days of the week	5 to 7 days/week	4 to 7 days/week in addition to habitual daily activity
Intensity (how hard?)	Moderate to vigorous*	None specified	Moderate to high, >40 to 60% of maximum	Moderate 40 to <60% of $VO_{2reserve}$	Moderate*	Moderate*
Time (how long?)	40 minutes/session	≥30 minutes/day	150 minutes/week	30 to 60 minutes continuous or accumulated in bouts ≥10 minutes each	≥30 minutes/day	Accumulation of 30 to 60 minutes/day
Type (what kind?) Primary	Aerobic	Aerobic	Aerobic	Aerobic	Aerobic	Dynamic exercise (aerobic)
Evidence rating	"High"¶Δ Grade B¶Δ Class IIa level of evidence A◇		Class 1 level of evidence A◇	Evidence category A,§¥ evidence category B§¥	Class 1 level of evidence A-B‡	Grade D†,**
Adjuvant			Dynamic RT	Dynamic RT 2 to 3 days/week Moderate 60 to 80% 1-RM, 8 to 12 repetitions	Dynamic RT 2 to 3 days/week	Dynamic, isometric, or handgrip RT
Evidence rating			Class IIa level of evidence B◇	Evidence category B§,¶¶		Grade D†
BP reduction (mmHg)	1 to 5	4 to 9		5 to 7 among those with hypertension	2 to 3 overall; 5 to 7 among those with hypertension	

FITT: Frequency, Intensity, Time, and Type of the exercise prescription; Ex R_X: exercise prescription; JNC 8: Eighth Joint National Committee; AHA: American Heart Association; ACC: American College of Cardiology; JNC 7: Seventh Joint National Committee; ACSM: American College of Sports Medicine; ESH: European Society of Hypertension; ESC: European Society of Cardiology; CHEP: Canadian Hypertension Education Program; $VO_{2reserve}$: oxygen uptake reserve; RT: resistance training; 1-RM: one repetition maximum; BP: blood pressure; NHLBI: National Heart, Lung, and Blood Institute.

* Moderate intensity is defined as 40 to <60% $VO_{2reserve}$ or an intensity that causes noticeable increases in heart rate and breathing; vigorous or high intensity is defined as ≥60% $VO_{2reserve}$ or an intensity that causes substantial increases in heart rate and breathing.

¶ The NHLBI[2] rating system grades the strength of the evidence (Evidence Statement) and the strength of the recommendation(s) (Evidence Recommendation); adapted from the US Preventive Services Task Force.[8]

Δ The Lifestyle Work Group rated the Evidence Statement for aerobic exercise to lower blood pressure as "high"†; the Evidence Recommendation for the Ex R_X (or FITT) to lower blood pressure was rated grade B¶ or "moderate"; corresponding to class IIa level of evidence A◇.

◇ Classification of recommendations and level of evidence per AHA guideline criteria.[4,9,10]

§ NHLBI grading of evidence.[11]

¥ The strength of evidence was rated: Evidence category B§ for the immediate effects of aerobic exercise or postexercise hypotension; evidence category A§ for aerobic exercise to lower blood pressure; evidence category B§ for the recommended aerobic Ex R_X (or FITT) to lower blood pressure.

‡ ESC recommendations.[12]

† CHEP graded recommendations by the underlying evidence[13] using grade A (strongest evidence, based on high-quality studies) to grade D (weakest evidence, based on low-power imprecise studies or expert opinion alone).

** CHEP assigned grade D† to "higher intensity exercise is not more effective."

¶¶ The strength of evidence was rated evidence category C‡ for the immediate effects of dynamic resistance exercise or postexercise hypotension.

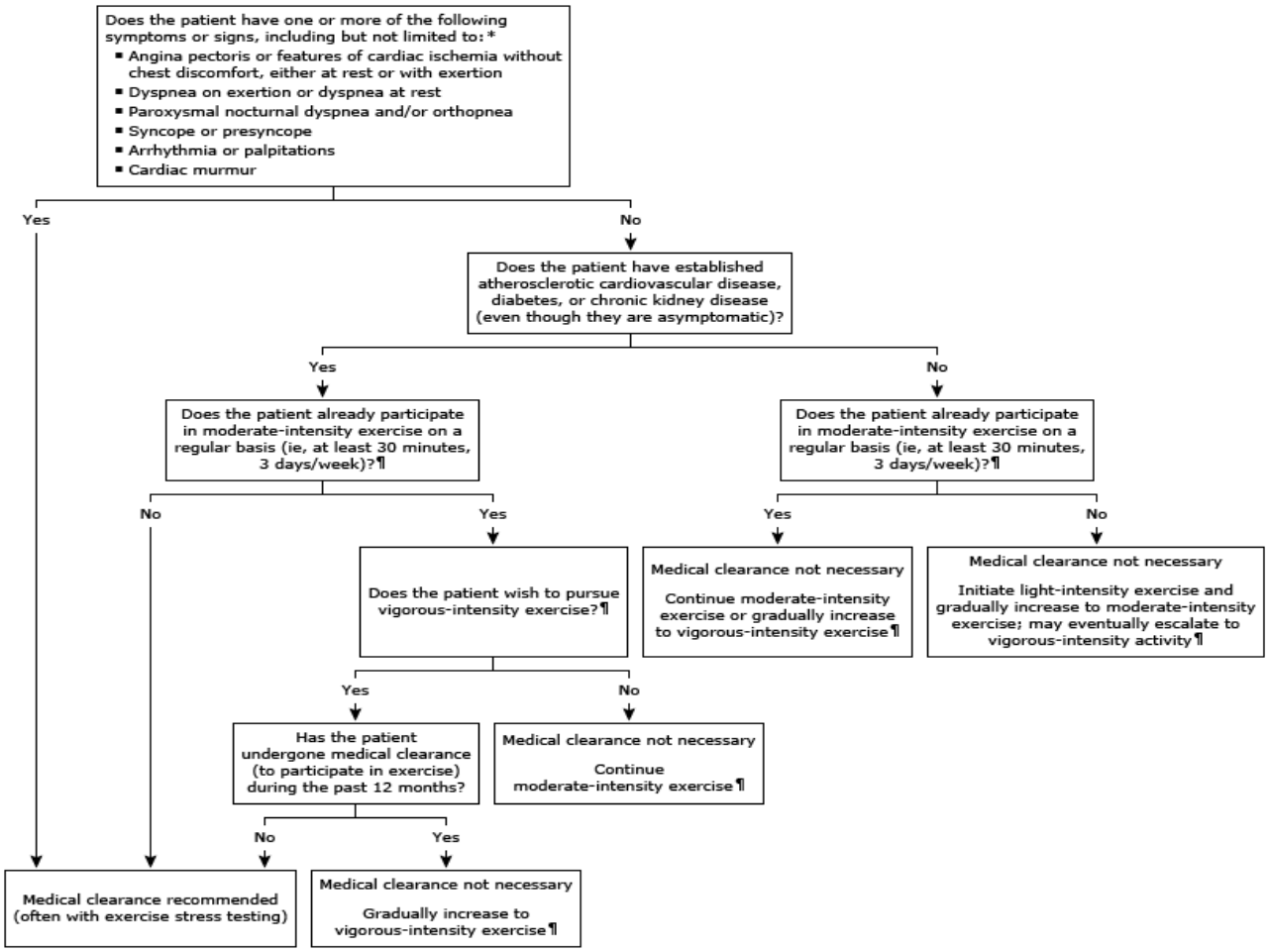
References:

1. *James PA, Oparil S, Carter BL, et al. 2014 Evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8) [published correction appears in JAMA 2014; 311:1809]. JAMA 2014; 311:507.*
2. *Eckel RH, Jakicic JM, Ard JD, et al. 2013 AHA/ACC guideline on lifestyle management to reduce cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines [published correction appears in J Am Coll Cardiol 2014; 63:3027]. J Am Coll Cardiol 2014; 63:2960.*
3. *Chobanian AV, Bakris GL, Black HR, et al. National High Blood Pressure Education Program Coordinating Committee. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report [published correction appears in JAMA 2003; 290:197]. JAMA 2003; 289:2560.*
4. *Brook RD, Appel LJ, Rubenfire M, et al. American Heart Association Professional Education Committee of the Council for High Blood Pressure Research, Council on Cardiovascular and Stroke Nursing, Council on Epidemiology and Prevention, and Council on Nutrition, Physical Activity. Beyond medications and diet: alternative approaches to lowering blood pressure; a scientific statement from the American Heart Association. Hypertension 2013; 61:1360.*
5. *Pescatello LS, Franklin BA, Fagard R, et al. American College of Sports Medicine position stand: exercise and hypertension. Med Sci Sports Exerc 2004; 36:533.*
6. *Mancia G, Fagard R, Narkiewicz K, et al. Task Force for the Management of Arterial Hypertension of the European Society of Hypertension and the European Society of Cardiology. 2013 ESH/ESC Practice Guidelines for the Management of Arterial Hypertension. Blood Press 2014; 23:3.*
7. *Dasgupta K, Quinn RR, Zarnke KB, et al. The 2014 Canadian Hypertension Education Program recommendations for blood pressure measurement, diagnosis, assessment of risk, prevention, and treatment of hypertension. Can J Cardiol 2014; 30:485.*
8. *U.S. Preventive Services Task Force Procedure Manual. Available at: http://www.uspreventiveservicestaskforce.org/Page/Name/procedure-manual. Published July 2008.*
9. *American Heart Association. Methodology Manual and Policies from the ACCF/AHA Task Force on Practice Guidelines. American Heart Association website. Available at: http://assets.cardiosource.com/Methodology_Manual_for_ACC_AHA_Writing_Committees.pdf. Published June 2010.*
10. *Gibbons RJ, Smith S, Antman E. American College of Cardiology/American Heart Association clinical practice guidelines, Part I: where do they come from? Circulation 2003; 107:2979.*
11. *Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults – the evidence report: National Institutes of Health [published correction appears in Obes Res 1998; 6:464]. Obes Res 1998; 6:51S.*
12. *Writing ESC guidelines. European Society of Cardiology.*
13. *McAlister FA. The Canadian Hypertension Education Program – a unique Canadian initiative. Can J Cardiol 2006; 22:559.*

Original table modified for this publication. From: Pescatello LS, MacDonald HV, Ash GI, et al. Assessing the Existing Professional Exercise Recommendations for Hypertension: A Review and Recommendations for Future Research Priorities. Mayo Clin Proc 2015; 90:801. Table used with the permission of Elsevier Inc. All rights reserved.

Table 2: Exercise recommendation to prevent and control blood pressure by professional societies [1,3,17-22].

Health screening process in patients wishing to participate in exercise



* List is not meant to be exhaustive. For example, the presence of a heart murmur, depending on its features, might warrant evaluation.

¶ Refer to UpToDate topics on prescribing exercise for adults and on exercise in the treatment of hypertension for definitions of light-, moderate-, and vigorous-intensity exercise.

Adapted from: Riebe D, Franklin BA, Thompson PD, et al. Updating ACSM's Recommendations for Exercise Preparticipation Health Screening. Med Sci Sports Exerc 2015; 47:2473.

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Conditions for implementing physical activity: (figure 1)

Exercise testing is recommended in some, but not most, patients who start an exercise program [25].

Risks associated with physical activity that is more intense than the daily routine call for precautions.

The patient's level of risk must be assessed. This takes into account the patient's blood pressure level, age, risk factors, family history of cardiovascular disease, target organ damage and the existence of cardiovascular disease.

Low-to-moderate-risk patients with mild-to-moderate hypertension do not require further investigation for moderate aerobic physical activity (<70% FMT).

For high-risk patients, it is essential to carry out a stress test before any physical activity.

In the case of symptomatic patients (coronary artery disease, heart failure, stroke), a stress test is indicated, and physical activity should ideally be resumed in a physical rehabilitation center.

Intense physical activity is not recommended if hypertension is severe or poorly controlled.

Conclusion:

Physical activity is an integral part of the hypertensive patient's therapeutic arsenal, and has become indispensable for permanently lowering blood pressure levels. It reduces overall risk by acting on other cardiovascular risk factors. It does, however, require knowledge of exercise physiology and, above all, motivation on the part of the physician to prescribe the right physical exercise for the patient.

References :

1. Brook RD, Appel LJ, Rubenfire M, et al. Beyond medications and diet: alternative approaches to lowering blood pressure: a scientific statement from the american heart association. Hypertension 2013; 61:1360.
2. Diaz KM, Shimbo D. Physical activity and the prevention of hypertension. Curr Hypertens Rep 2013; 15:659.
3. Pescatello LS, MacDonald HV, Ash GI, et al. Assessing the Existing Professional Exercise Recommendations for Hypertension: A Review and Recommendations for Future Research Priorities. Mayo Clin Proc 2015; 90:801.
4. Boutcher YN, Boutcher SH. Exercise intensity and hypertension: what's new? J Hum Hypertens 2017; 31:157.
5. Kraus WE, Bittner V, Appel L, et al. The National Physical Activity Plan: a call to action from the American Heart Association: a science advisory from the American Heart Association. Circulation 2015; 131:1932.
6. Muntner P, Carey RM, Gidding S, et al. Potential US Population Impact of the 2017 ACC/AHA High Blood Pressure Guideline. Circulation 2018; 137:109.
7. Yoon SS, Gu Q, Nwankwo T, et al. Trends in blood pressure among adults with hypertension: United States, 2003 to 2012. Hypertension 2015; 65:54.
8. https://www.cdc.gov/nchs/data/ahcd/namcs_summary/2014_namcs_web_tables.pdf.
9. American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Pres cription, 9th ed, Lippincott Williams & Wilkins, Baltimore 2013.
10. Go4Life from the National Institute on Aging at the NIH. https://go4life.nia.nih.gov/4-typ es-exercise (Accessed on January 19, 2017).
11. Lawrence J Appel, MD, MPH, Exercise in the treatment and prevention of hypertensi on, UpToDate, Jun 15, 2023.
12. Barone Gibbs B, Hivert MF, Jerome GJ, et al. Physical Activity as a Critical Component of First-Line Treatment for Elevated Blood Pressure or Cholesterol: Who, What, and How?: A Scientific Statement From the American Heart Association. Hypertension 2021; 78:e26.
13. Moraes-Silva IC, Mostarda C, Moreira ED, et al. Preventive role of exercise training in autonomic, hemodynamic, and metabolic parameters in rats under high risk of metabolic syndrome development. J Appl Physiol (1985) 2013; 114:786.
14. Araujo AJ, Santos AC, Souza Kdos S, et al. Resistance training controls arterial blood pressure in rats with L-NAME- induced hypertension. Arq Bras Cardiol 2013; 100:339.
15. Dasgupta K, Quinn RR, Zarnke KB, et al. The 2014 Canadian Hypertension Education Program recommendations for blood pressure measurement, diagnosis, assessment of risk, prevention, and treatment of hypertension. Can J Cardiol 2014; 30:485.
16. James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults: report from the panel members appointed to the Eighth Joint National Committee (JNC 8). JAMA 2014; 311:507.
17. Nickey WA, Lenfant C, Chobanian AV, Roccella EJ. The National High Blood Pressure Education Program: longtime partners with new strategies. J Am Osteopath Assoc 2003; 103:297.
18. Eckel RH, Jakicic JM, Ard JD, et al. 2013 AHA/ACC guideline on lifestyle management to reduce cardiovascular risk: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation 2014; 129:S76.
19. Pescatello LS, Franklin BA, Fagard R, et al. American College of Sports Medicine position stand. Exercise and hypertension. Med Sci Sports Exerc 2004; 36:533.
20. Mancia G, Fagard R, Narkiewicz K, et al. 2013 ESH/ESC Guidelines for the management of arterial hypertension: the Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). J Hypertens 2013; 31:1281.
21. Management of adult patients with essential hypertension. HAS July 2005.
22. Fagard RH. Exercise characteristics and blood presure response to dynamic physical training. Med Sci Sports Exerc. 2001; 33: 5484-5492.
23. Riebe D, Franklin BA, Thompson PD, et al. Updating ACSM's Recommendations for Exercise Preparticipation Health Screening. Med Sci Sports Exerc 2015; 47:2473.

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