MAYO CLINIC

REVIEW

Assessing the Existing Professional Exercise Recommendations for Hypertension: A Review and Recommendations for Future Research Priorities

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Abstract

The Eighth Joint National Committee guideline on the management of adult hypertension was recently released. Rather than recommending specific lifestyle modifications as in the Seventh Joint National Committee guideline, the Eighth Joint National Committee endorsed the recommendations of the American Heart Association/American College of Cardiology 2013 Lifestyle Work Group. The Lifestyle Work Group report included systematic reviews and meta-analyses of randomized controlled trials or controlled clinical trials from 2001 through 2011 of "fair to good" quality. In total, 11 reviews qualified for inclusion in the report, 6 of which included blood pressure (BP) as the primary outcome. Three reviews did not find significant reductions in BP, and BP status was not reported in 5. When BP was reported, only 22% of the patients had hypertension. Yet, the group concluded with a strength of evidence categorized as "high" that aerobic exercise training reduces BP by 1 to 5 mm Hg in individuals with hypertension and that the most effective exercise interventions on average included aerobic physical activity of moderate to vigorous intensity for at least 12 weeks, 3 to 4 sessions per week lasting 40 minutes per session. The exercise prescription recommendations of the Lifestyle Work Group deviate from those of other professional organizations and committees including the Seventh Joint National Committee, another American Heart Association scientific statement, the American College of Sports Medicine, the European Society of Hypertension/European Society of Cardiology, and the Canadian Health Education Program. The purposes of this review are to present the existing exercise recommendations for hypertension, discuss reasons for differences in these recommendations, discuss gaps in the literature, and address critical future research needs regarding exercise prescription for hypertension.

 ■ Mayo Clin Proc. 2015;90(6):801-812

The long-awaited evidence-based guideline from the Eighth Joint National Committee (JNC 8) on the management of adult hypertension was recently released.[1] The JNC 8 guideline has generated considerable debate because it departs from established blood pressure (BP) classifications on which treatment was previously based.[2-4] Furthermore, rather than recommending specific lifestyle modifications as was done by the Seventh Joint National Committee (JNC 7),[2] JNC 8 supported the lifestyle modifications recommended by the American Heart Association (AHA)/American College of Cardiology 2013 Lifestyle Work Group.[5]

The Lifestyle Work Group considered evidence only from systematic reviews and meta-analyses published between 2001 and 2011 relating to physical activity and BP. The writing group acknowledged that because of limited resources and time, they could not review every study.

Although the group concluded that the strength of evidence for physical activity to lower BP was "high," the exercise prescription (Ex R_x) for hypertension that they recommended differs from those of other professional organizations and committees including JNC 7,[2] another recent AHA scientific statement,[6] the American College of Sports Medicine (ACSM),[7] the European

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ARTICLE HIGHLIGHTS

- Exercise is recommended as a key lifestyle therapy for adults with high blood pressure (BP) for the prevention, treatment, and control of hypertension by the Seventh Joint National Committee, the Eighth Joint National Committee, the American Heart Association/American College of Cardiology Lifestyle Work Group, another American Heart Association scientific statement, the American College of Sports Medicine, the European Society of Hypertension/ European Society of Cardiology, and the Canadian Hypertension Education Program.
- A recurrent theme throughout this review is that there is a substantial lack of evidence on many issues surrounding BP treatment and management in adults with hypertension despite the considerable volume of literature in this area, including exercise prescription (Ex R_x) for hypertension.
- An Ex R_x is the process whereby the recommended physical activity program is designed in a systematic and individualized manner in terms of the *F*requency (how often?), *I*ntensity (how hard?), *T*ime (how long?), and *T*ype (what kind?), known as the FITT principle.
- The professional organizations and committees included in this review report a wide range in the magnitude of the BP reduction resulting from exercise training (ie, 1-9 mm Hg), and in 2 instances, the magnitude was not specified.
- There are many possible reasons for the variability in the magnitude of the BP reduction in response to exercise training in the sources discussed in this review, including (1) the review methodology used by the professional organizations and committees to arrive at their conclusions were often based on expert opinion, (2) the lower methodological quality of the exercise and hypertension literature in general, and (3) BP status is often not reported in exercise and hypertension studies, and when it is, most adults enrolled in exercise and hypertension studies do not have hypertension.
- Despite the current limitations and differences in the FITT of the recommended Ex R_x for hypertension, the consensus that can be taken from the level of agreement among the various professional recommendations is for adults with pre- to established hypertension to participate in 30 min/d or more of moderate-intensity aerobic exercise on most, if not all, days of the week to total 150 min/wk or more.

Society of Hypertension/European Society of Cardiology,[8] and the Canadian Hypertension Education Program.[9] The purposes of this review are to present the exercise recommendations for hypertension made by these professional organizations and committees, discuss reasons for the differences in these recommendations, present gaps in the literature, and address critical future research needs regarding the prescription of exercise for hypertension.

OVERVIEW OF THE JNC 8 GUIDELINE

The JNC 8 panel members used rigorous, evidence-based methods guided by 3 critical questions to develop evidence statements and recommendations for BP treatment in adults with hypertension to meet user needs, especially those of primary care clinicians.[1] The 3 critical questions were judged by the panel to be those of the highest priority, and they related to hypertension management and addressed thresholds and goals for pharmacological treatment. The panel's decision to rely solely on evidence from randomized clinical trials (RCTs) versus relying on the totality of evidence that could have been included in addition to RCTs, especially observational studies, systematic reviews, and meta-analyses as well as expert option, is one reason for the debate that has surrounded the release of the JNC 8 guideline.[3]

Following fundamental scientific methods, higher-quality interventions suggest lower bias and higher validity.[10,11] Yet, this "best evidence approach"[12] often limits included studies to RCTs exclusively, and despite however strong their methodological quality, RCTs are but one dimension of the literature.[10,13-15] Scientific discovery and its translation to clinical practice rely on the replication of findings from independent groups to ensure the robustness of the observed effects across relevant parameters. By gathering all relevant trials related to the underlying phenomenon, meta-analyses and systematic reviews are able to gauge the extent to which trials replicate each other's findings and evaluate potential reasons for discrepancies among results, such as differences in study populations and the content of the experimental and control arms. Furthermore, even when internally valid RCTs (ie, when differences in study groups are due solely to the different treatments regimes) are included in evidence-based syntheses, the results may not

Mayo Clin Proc. ■ June 2015;90(6):801-812 ■ http://dx.doi.org/10.1016/j.mayocp.2015.04.008
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