The role of exercise in blood pressure control: supportive evidence

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Authors' objectives
To assess the effect of dynamic physical training on blood pressure.

Searching
The author does not state what sources were searched.

Study selection
Study designs of evaluations included in the review
Controlled studies were included.

Specific interventions included in the review
Physical training over 4 to 68 weeks (median 16 weeks), with a most common frequency of 3 sessions a week of 15 to 90 minutes each and a training intensity of 50 to 85% of maximal exercise capacity.

Participants included in the review
The participants were adolescent or adult normotensive or hypertensive participants in whom cardiovascular disease was reasonably well excluded. These were mainly men. The average age of groups ranged from 16 to 72 years.

Outcomes assessed in the review
The outcomes assessed were systolic and diastolic blood-pressure at rest, heart rate at rest, body weight and physical work capacity.

How were decisions on the relevance of primary studies made?
The author does not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The validity of the primary studies was assessed by allocation to groups; comparability of assessment of outcomes and follow-up. The author does not state how the papers were assessed for validity, or how many of the reviewers performed the validity assessment.

Data extraction
The author does not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

Methods of synthesis
How were the studies combined?
The overall training-induced changes, weighted for number of participants and adjusted for control data, were calculated.

How were differences between studies investigated?
The studies were grouped by pre-training blood-pressure levels, according to the 1978 criteria of the World Health Organization. In addition, the studies were grouped by study design. The studies which investigated the effects on ambulatory blood-pressure were also analysed separately.
**Results of the review**
Thirty-six reports including 48 study groups were included.

Overall training-induced changes (weighted means adjusted for control data).

- Systolic blood-pressure (mmHg) (48 groups): -5.3 (95% CI: -7.2, -3.4).
- Diastolic blood-pressure (mmHg) (47 groups): -4.8 (95% CI: -6.2, -3.4).
- Heart rate (beats/minute) (36 groups): -6.1 (95% CI: -7.3, -4.8).
- Weight (kg) (35 groups): -0.84 (95% CI: -1.16, -0.53).
- Physical work capacity (%) (43 groups): +15.1 (95% CI: +13.4, +16.9).

Results according to baseline blood pressure (mean net change in blood pressure (95% confidence intervals)).

- Normal average pressure (27 groups): -3 (-5, -1)/-3 (-4, -2) mmHg.
- Borderline hypertensive (7 groups): -6 (-9, -3)/-7 (-11, -3) mmHg.
- Hypertensive (14 groups): -10 (-14, -6)/-8 (-11, -4) mmHg.

Studies which followed the more rigorous scientific criteria showed the smallest decrease in blood-pressure, which was not significant in normotensives but still significant in hypertensive patients.

**Authors' conclusions**
Despite shortcomings in many individual studies, the overall results suggest that dynamic aerobic training may lower conventional and daytime blood-pressure in adults with elevated blood-pressure at baseline.

**CRD commentary**
This editorial reviews the effects of physical exercise on blood-pressure among different subgroups and according to study design. However, because much of the review methodology used has not been reported here (e.g. search strategy, decision procedures, data extraction), it is not possible to assess how comprehensive and rigorous this review has been without referring to another paper (see Other Publications of Related Interest). Details are given only of the 10 study groups (out of 48) in which blood-pressure was measured both during the day and at night, although limitations of the included studies are discussed.

**Implications of the review for practice and research**
Further training studies should be better designed and include random allocation and follow-up of control subjects.

**Bibliographic details**

**PubMedID**
8984117

**Other publications of related interest**
Indexing Status
Subject indexing assigned by NLM

MeSH
Blood Pressure; Epidemiologic Methods; Humans; Longitudinal Studies; Physical Education and Training; Physical Exertion; Physical Fitness

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.