The effects of exercise on secondary prevention and health-related quality of life in people with existing vascular disease: a systematic review and meta-analysis

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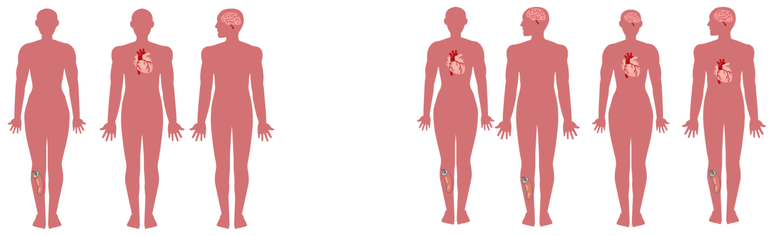
1. Introduction

- Cardiovascular diseases including stroke, heart failure, coronary artery disease and peripheral arterial disease remain the leading cause of death globally.
- Atherosclerosis is the common underlying aetiological factor.
- **Polyvascular disease** (atherosclerosis across two or more vascular beds) is becoming increasingly common.



- People with polyvascular conditions are at higher risk of major adverse cardiovascular events compared to those with single conditions.
- Exercise is effective for secondary prevention and quality of life for each of these single conditions but effects on polyvascular disease are unknown.

2. Research questions

- **What is the effect of exercise on the secondary prevention of major cardiovascular events and health-related quality of life (HRQoL) in people with vascular disease?**
- **Is this impacted by polyvascular disease?**

3. Methods

Searched:
- Cochrane Register of Studies Online
- MEDLINE
- Embase
- CINAHL
- Trial registries

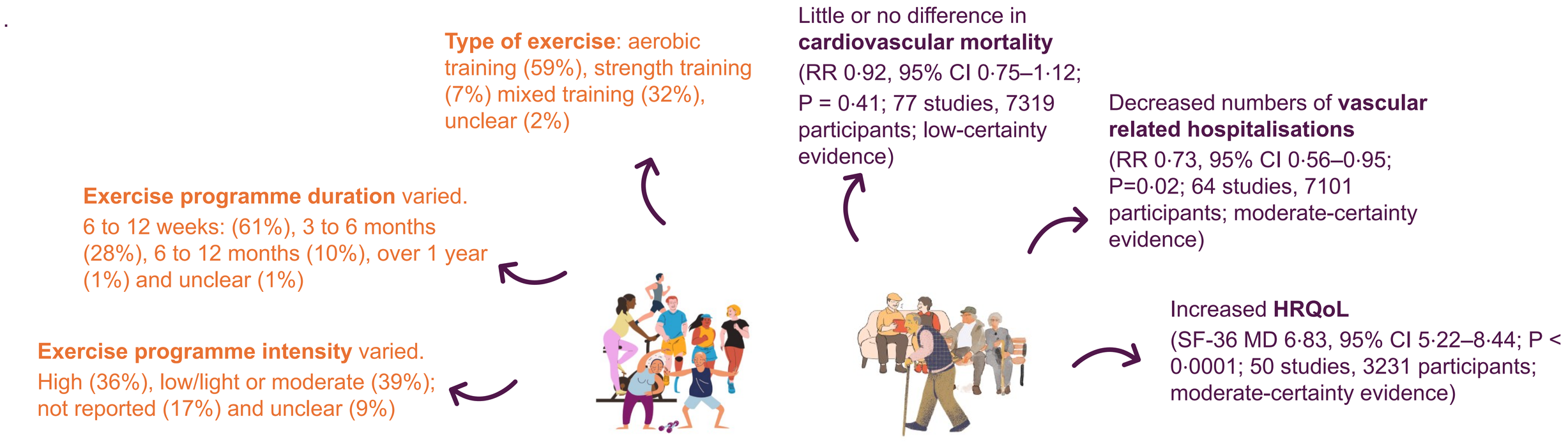
(Jan 2016 to Jan 2025)

- Randomised controlled trials (RCTs)
- Participants with stroke (including TIA) or coronary artery disease CAD) or heart failure (HF) or peripheral arterial disease (PAD)
- Exercise = planned, structured, and repetitive bodily movement to improve or maintain strength and/or cardiorespiratory fitness
- Exercise programmes of at least 6 weeks compared with no exercise or usual care

4. Results

- 280 RCTs included
- 51 different countries
- 23,419 participants
- 64% male
- Mean age varied from 32 to 82 years old

Figure illustrates findings from meta-analysis at end of exercise programme, combining studies which included populations with stroke, HF, CAD or PAD. Data presented as risk ratio (RR) or mean difference (MD), (95% confidence interval), P value; number of studies, number of participants; certainty of evidence assessed by GRADE. % = % of included RCTs. 92% of RCTs were considered as being unclear or high-risk in one or more domains.



41% of RCTs did not report if they included populations with more than one vascular disease; **34% mixed (proportion with two or more conditions) 23% single condition, 3% polyvascular**

Subgroup analyses were undertaken to investigate impact of polyvascular conditions compared to single condition, ischaemic aetiology populations compared to mixed cause populations, and type, dose and intensity of exercise programmes. Where differences were detected, our confidence was limited by small numbers of RCTs in the subgroups.

5. DISCUSSION and CONCLUSIONS

- **Exercise programmes are safe and benefit people with vascular disease**
- **This evidence should inform clinical guidance on exercise for people with polyvascular conditions**
- **Future research should focus more on polyvascular disease as it's prevalence is rising**

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