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**Tai chi for primary prevention of cardiovascular disease.**Hartley L<sup>1</sup>, Flowers N, Lee MS, Ernst E, Rees K.

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**Abstract**

**BACKGROUND:** Stress and a sedentary lifestyle are major determinants of cardiovascular disease (CVD). As tai chi involves exercise and can help in stress reduction, it may be effective in the primary prevention of CVD.

**OBJECTIVES:** To determine the effectiveness of tai chi for the primary prevention of CVD.

**SEARCH METHODS:** We searched the following electronic databases: the Cochrane Central Register of Controlled Trials (CENTRAL) (Issue 11, 2013); MEDLINE (Ovid) (1946 to November week 3, 2013); EMBASE Classic + EMBASE (Ovid) (1947 to 6 December 2013); Web of Science (Thomson Reuters) (1970 to 6 December 2013); PsycINFO (Ovid) (1806 to December week 1, 2013); Database of Abstracts of Reviews of Effects (DARE); Health Technology Assessment Database and Health Economics Evaluations Database (Issue 4, 2013). We also searched the Allied and complementary Medicine Database (AMED) and OpenGrey (inception to October 2012) and several Asian databases. We searched trial registers and reference lists of reviews for further studies. We applied no language restrictions.

**SELECTION CRITERIA:** Randomised controlled trials of tai chi lasting at least three months involving healthy adults or adults at high risk of CVD. The comparison group was no intervention or minimal intervention. The outcomes of interest were CVD clinical events and CVD risk factors. We excluded trials involving multifactorial lifestyle interventions or focusing on weight loss to avoid confounding.

**DATA COLLECTION AND ANALYSIS:** Two review authors independently selected trials for inclusion, abstracted the data and assessed the risk of bias.

**MAIN RESULTS:** We identified 13 small trials (1520 participants randomised) and three ongoing trials. All studies had at least one domain with unclear risk of bias, and some studies were at high risk of bias for allocation concealment (one study) and selective reporting (two studies). Duration and style of tai chi differed between trials. Seven studies recruited 903 healthy participants, the other studies recruited people with borderline hypertension or hypertension, elderly people at high risk of falling, and people with hypertension with liver and kidney yin deficiency syndrome. No studies reported on cardiovascular mortality, all-cause mortality or non-fatal events as most studies were short term (all studies had follow-up of one year or less). There was also considerable heterogeneity between studies, which meant that it was not possible to combine studies statistically for cardiovascular risk (I<sup>2</sup> statistic for systolic blood pressure (SBP) was 96%, for diastolic blood pressure (DBP) 96%, for total cholesterol 96%, low-density lipoprotein-cholesterol (LDL-C) 95%, high-density lipoprotein-cholesterol (HDL-C) 98%, triglycerides 75%). Nine trials measured blood pressure, six individual trials found reductions in SBP (reductions ranged from -22.0 mmHg (95% confidence interval (CI) -26.3 to -17.7) to -11.5 mmHg (95% CI -21.5 to -1.46)), two trials found no clear evidence of a difference (however, CIs were wide and an increase or decrease in SBP cannot be ruled out), and one trial found an increase in SBP with tai chi (increase 5.2 mmHg, 95% CI 3.73 to 6.67). A similar pattern was seen for DBP: three trials found a

reduction in DBP (reductions ranged from -12.2 mmHg (95% CI -15.8 to -8.7) to -4.43 mmHg (95% CI -7.14 to -1.72)) and three trials found no clear evidence of a difference, however again with wide CIs. Three trials reported lipid levels and two found reductions in total cholesterol, LDL-C and triglycerides (total cholesterol reductions ranged from -1.30 mmol/L (95% CI -1.57 to -1.03) to -0.50 mmol/L (95% CI -0.74 to -0.26): LDL-C reductions ranged from -0.76 mmol/L (95% CI -0.93 to -0.59) to -0.59 mmol/L (95% CI -0.80 to -0.38): triglyceride reductions ranged from -0.46 mmol/L (95% CI -0.62 to -0.30) to -0.37 mmol/L (95% CI -0.67 to -0.07)) and increased HDL-C with the intervention (HDL-C increases ranged from 0.61 mmol/L (95% CI 0.51 to 0.71) to 0.16 mmol/L (95% CI 0.02 to 0.30)), while the third study found no clear evidence of a difference between groups on lipid levels. Quality of life was measured in one trial: tai chi improved quality of life at three months. None of the included trials reported on adverse events, costs or occurrence of type 2 diabetes.

**AUTHORS' CONCLUSIONS:** There are currently **no long-term trials** examining tai chi for the primary prevention of CVD. Due to the limited evidence available currently no conclusions can be drawn as to the effectiveness of tai chi on CVD risk factors. There was **some suggestion of beneficial effects of tai chi on CVD risk factors** but this was not consistent across all studies. There was considerable heterogeneity between the studies included in this review and studies were small and at some risk of bias. Results of the ongoing trials will add to the evidence base but additional longer-term, high-quality trials are needed.

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