Being fit can partially offset negative impact of high blood pressure

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High fitness levels may reduce the risk of death from cardiovascular disease in men with high blood pressure, according to a 29-year study published today (March 23) in the *European Journal of Preventive*

Cardiology.

"This was the first study to evaluate the joint effects of fitness and blood pressure on the risk of dying from cardiovascular disease," said study author Professor Jari Laukkanen of the University of Eastern Finland, Kuopio, Finland. "The results suggest that being fit helps protect against some of the negative effects of high blood pressure."

Nearly 1.3 billion adults aged 30 to 79 years worldwide have high blood pressure (hypertension). Hypertension is a major risk factor for heart attack and stroke and a leading cause of premature death globally. Previous studies have shown that high cardiorespiratory fitness is linked with greater longevity. This study examined the interplay between blood pressure, fitness and risk of death from cardiovascular disease.

The study included 2,280 men aged 42 to 61 years living in eastern Finland and enrolled in the Kuopio Ischaemic Heart Disease Risk Factor Study. Baseline measurements were conducted between 1984 and 1989. These included blood pressure and cardiorespiratory fitness, which was assessed as maximal oxygen uptake while riding a stationary bicycle. Blood pressure was classified as normal or high, and fitness was classified as low, medium or high.

The average age at baseline was 53 years. Participants were followed up until 2018. During a median follow up of 29 years, there were 644 deaths due to cardiovascular disease. The risk of death from cardiovascular disease was analyzed after adjusting for age, body mass index, cholesterol levels, smoking status, type 2 diabetes, coronary heart disease, use of antihypertensive medication, alcohol consumption, physical activity, socioeconomic status, and high sensitivity C-reactive protein (a marker of inflammation).

Considering blood pressure alone, compared to normal values, high

blood pressure was associated with a 39% increased risk of cardiovascular mortality (hazard ratio [HR] 1.39; 95% confidence interval [CI] 1.17–1.63). Considering fitness alone, compared with high levels, low fitness was associated with a 74% elevated likelihood of cardiovascular death (HR 1.74; 95% CI 1.35–2.23).

To evaluate the joint associations of blood pressure and fitness with risk of cardiovascular death, participants were categorized into four groups: 1) normal blood pressure and high fitness (this was the reference group for comparison); 2) normal blood pressure and low fitness; 3) high blood pressure and high fitness; 4) high blood pressure and low fitness.

Men with high blood pressure and low fitness had a more than doubled risk of cardiovascular death compared to those with normal blood pressure and high fitness (HR 2.35; 95% CI 1.81–3.04). When men with high blood pressure had high fitness levels, their elevated risk of cardiovascular risk persisted but was weaker: it was 55% higher than those with normal blood pressure and high fitness (HR 1.55; 95% CI 1.16–2.07).

Professor Laukkanen said, "Both high blood pressure and low fitness levels were each associated with an increased risk of cardiovascular death. High fitness levels attenuated, but did not eliminate, the increased risk of cardiovascular mortality in men with elevated blood pressure."

The paper states, "The inability of cardiorespiratory fitness to completely eliminate the risk of cardiovascular mortality in those with high blood pressure could partly be due to the strong, independent and causal relationship between blood pressure and cardiovascular disease."

Professor Laukkanen concluded, "Getting blood pressure under control should remain a goal in those with elevated levels. Our study indicates that men with high blood pressure should also aim to improve their

fitness levels with regular physical activity. In addition to habitual exercise, avoiding excess body weight may enhance fitness."

ESC guidelines recommend that adults of all ages to strive for at least 150 to 300 minutes a week of moderate-intensity or 75 to 150 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination, to reduce all-cause death, cardiovascular death, and illness.

More information: Jari A Laukkanen et al, High fitness levels attenuate the increased risk of cardiovascular deaths in individuals with high systolic blood pressure, *European Journal of Preventive Cardiology* (2023). DOI: 10.1093/eurjpc/zwad034

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