# マラソンランナーは心疾患のリスクが高い可能性がある

過度の長期間持久運動は動脈スティフネスを増加させ心血管系の健康状態に影響する可能性がある

Too much long-term endurance exercise increases aortic stiffness and may impact cardiovascular health

新たなデータにより定期的に走っているマラソンランナーは動脈のスティフネスが増加していることが示され、一部の高強度の運動は心血管系の健康状態に悪影響を及ぼす可能性があることが示唆されたと、第59回American College of Cardiologyで発表された。研究者らは、定期的にマラソンをして鍛えている健常人49人と持久運動をしていないコントロール46人の血圧および動脈の弾力性を比較した。マラソンランナーは定期的に週2～9時間走り30ヵ月から21年間継続していた。研究者らは脈波伝搬速度を用いて動脈のスティフネスを計測した。全ての検査は被検者が安静にしている時に行われた。マラソンランナーは上腕の上腕動脈で計測した収縮期血圧がコントロール群よりも有意に高かった（126±15対115±12）。上腕動脈の拡張期血圧（78±10対71±9）および平均血圧（94±12対86±10）もまたコントロールと比較し高かった。脈波伝搬速度もまたマラソンランナーにおいて高く（6.9±1対6.3±1）、マラソンランナーは動脈のスティフネスが上昇していることが示唆された。運動強度と動脈のスティフネスは正の相関関係にあり、より強度の運動により大きな動脈のスティフネスが上昇する可能性が考えられた。

## Full Text

New data show regular marathon runners have increased stiffness of the aorta, suggesting that some types of higher intensity exercise may negatively impact heart health, according to research presented at the American College of Cardiology's 59th annual scientific session.

The study - the first to investigate the chronic effect of intense long-term endurance training on the elastic properties of the large arteries - found that male marathon athletes (females were not included in the study) had significantly increased stiffness of the aorta when compared with subjects of similar health status performing recreational exercise.

"Our data suggest that exercise may have an inverted U-shape relation with arterial stiffness. In other words, when you do not exercise you have higher risk of cardiovascular events, but the same also happens when you exercise too much," said Despina Kardara, M.D., Athens Medical School, Hippokration Hospital, Athens, Greece, and lead investigator of the study. "Regular long-term endurance training is generally beneficial for heart health, but it seems that the cardiovascular system is like a sports car engine. If you do not use it, it will decay, but if you run it too fast for too long, you might burn it out."

Researchers evaluated blood pressure and artery elasticity in 49 healthy men who regularly trained to run marathons and 46 control subjects who were not endurance athletes. Marathon runners had regular training times ranging from two to nine hours per week over periods ranging from 30 months to 21 years.

Control participants were matched for age, height and cardiovascular risk factors. To estimate stiffness of the aorta, researchers used an index called pulse wave velocity that measures the speed at which blood travels through the aorta. All tests were performed when participants were at rest prior to the marathon race.

Marathon runners had significantly higher systolic blood pressure than controls when measured at the brachial artery in the upper arm (126±15 vs. 115±12). Brachial diastolic blood pressure (78±10 vs.71±9) and mean blood pressure (94±12 vs. 86±10) were also increased compared to controls. Pulse wave velocity was also higher in athletes (6.9±1 vs. 6.3±1), indicating that marathon runners had increased aortic stiffness. The intensity of participants' exercise regimens was positively related to arterial stiffness, suggesting that more vigorous exercise may result in increased stiffness of the large arteries.

"This is important because stiff arteries lead to high blood pressure and can impair the heart, keeping it from performing properly," Dr. Kardara said. "Overall, aortic stiffness is an indicator of cardiovascular disease and hardening of the arteries, and a predictor of heart attack and related death."

Researchers say there may be several explanations for arterial stiffening in marathon runners. One plausible theory is that extreme exercise may place repeated and excessive stress on the artery wall leading to its fatigue, according to Charalambos Vlachopoulos, M.D., Athens Medical School, Hippokration Hospital, a co-investigator of the study.

"Endurance athletes should be cautious about the amount and volume of their training programs, trying not to wear themselves out, and always work in close collaboration with their physicians, especially before participating in an intense endeavor like marathon running," said Dr. Kardara.

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