

## HEART

### Too much prolonged high intensity exercise risks heart health

*Two studies indicate J shaped curve for benefits of physical activity: more doesn't always mean better*

[A reverse J-shaped association of leisure time physical activity with prognosis in patients with stable coronary heart disease: evidence from a large cohort with repeated measurements Online First doi 10.1136/heartjnl-2013-305242] And

[Atrial fibrillation is associated with different levels of physical activity at different ages in men Online First doi 10.1136/heartjnl-2013-305304]

Linked editorial [Exercise and the heart: unmasking Mr Hyde Online First doi 10.1136/heartjnl-2014-305780]

Overdosing on high intensity exercise may actually increase the risk of death from a heart attack or stroke in those with existing heart disease, suggests German research published online in the journal Heart.

Similarly, a second Swedish study in the journal suggests that young men undertaking endurance exercise for more than five hours a week may increase their risk of developing an irregular heart rhythm in later life.

Both sets of findings indicate a J-shaped curve for the health benefits of exercise, with more not always meaning better, and raise questions about the intensity and duration of physical activity at different times of life, says a linked editorial.

In the German study, the researchers tracked the frequency and intensity of physical activity and the survival of more than 1000 people with stable coronary artery heart disease for 10 years.

All the participants, most of whom were in their 60s, had attended a cardiac rehabilitation programme to help them exercise regularly and ward off a further heart attack or stroke.

Current guidance recommends that heart disease patients should do up to an hour of moderate intensity aerobic activity at least five times a week. Around 40% were physically active 2-4 times weekly; 30% did more; 30% did less. Overall, one in 10 said they rarely or never did any exercise.

Exercise frequency tended to tail off during the monitoring period, although it remained stable for those physically active 2-4 times a week.

After taking account of other influential factors, the most physically inactive were around twice as likely to have a heart attack/stroke as those who were regularly physically active. And they were around four times as likely to die of cardiovascular and all other causes.

But somewhat surprisingly, those who did the most strenuous daily exercise were also more than twice as likely to die of a heart attack/stroke, the findings showed.

In the Swedish study, the researchers quizzed more than 44,000 45-79 year old men about their leisure time physical activity patterns at the ages of 15, 30, 50, and during the past year, when their average age was 60.

Participants' heart health was tracked for an average of 12 years from 1997 onwards to gauge how many developed an irregular heartbeat or atrial fibrillation— a known risk factor for stroke.

They found that men who had exercised intensively for more than five hours a week were 19% more likely to have developed the condition by the age of 60 than those exercising for less than one hour a week.

This level of risk rose to 49% among those who did more than five hours of exercise a week at the age of 30, but who subsequently did less than an hour by the time they were 60.

But those who cycled or walked briskly for an hour a day or more at the age of 60 were around 13% less likely to develop atrial fibrillation than those who did virtually no exercise at all.

In a linked editorial, Spanish authors suggest that this might be because the intensity of exercise is likely to be greater at the age of 30 than it is at the age of 60, so may have less extreme effects on the body.

But both studies point to intensity and duration of exercise as critical factors in the associations found, they say. And they describe “a similar U-shaped or reverse J-shaped pattern for the dose-response effect of exercise: maximum cardiovascular benefits are obtained if performed at moderate doses, while these benefits are lost with (very high) intensity and prolonged efforts.”

While it seems “counterintuitive” to think that physical activity could aggravate heart disease, other smaller studies have also suggested this possibility, they add, with endurance training in particular, linked to an acute (reversible) pro-inflammatory state.

Genes may also have an important role in determining the ‘safety threshold,’ they go on to suggest.

But while our perceptions of how much exercise is good for us may be changing, the fact remains that none is bad for our long term health, they emphasise. “A thin line separates accurate information and unnecessary alarmism, leading to inactivity and consequent heart disease,” they warn.

“The benefits of exercise are definitely not to be questioned; on the contrary, they should be reinforced. The studies reviewed here, and future studies, will serve to maximise benefits obtained by regular exercise while preventing undesirable effects—just like all other drugs and therapies,” they conclude.