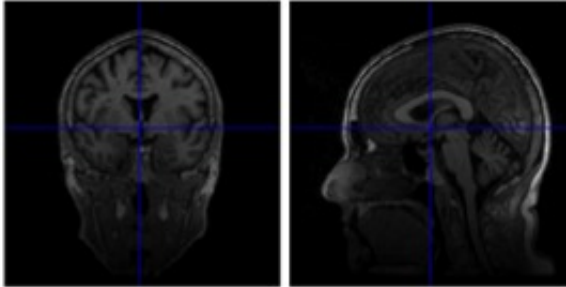


Fitter legs linked to a 'fitter' brain

November 10 2015



Brain changes in identical twins discordant for leg explosive power: stronger twin

Researchers at King's College London have found that muscle fitness as measured by power in the legs is strongly associated with an improved rate of ageing in the brain.

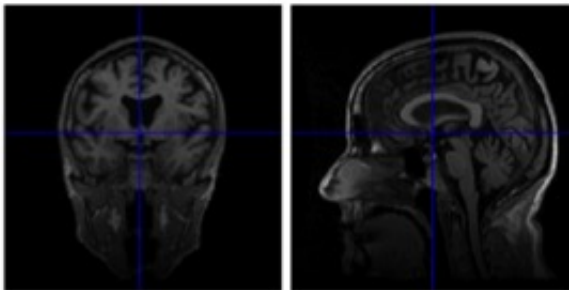
The findings, published in *Gerontology*, suggest that simple interventions, such as increased levels of walking, targeted to improve leg power in the long term may have an impact on healthy cognitive ageing. The research was funded jointly by the NIHR and the Wellcome Trust.

Scientists studied a sample of 324 healthy female twins from the TwinsUK volunteer registry over a ten-year period from 1999, measuring various health and lifestyle predictors. Researchers were, therefore, able to control for genetic factors affecting changes in cognitive function.

Thinking, learning and memory were measured at both the beginning and end of the study and it was found that leg power was a better predictor of cognitive change than any other lifestyle factors tested. Generally, the twin who had more leg power at the start of the study sustained their cognition better and had fewer [brain](#) changes associated with ageing measured after ten years.

Previous studies have shown that physical activity can have a beneficial effect on the ageing of the brain with animal studies showing that exercising muscles releases hormones that can encourage nerve cells to grow.

The study is thought to be the first that shows a specific link between power (i.e. force and speed) in the lower limbs and cognitive change in a normal, healthy population. As the legs contain the largest muscles they are of particular relevance for muscular fitness and can be exercised easily through various habitual activities such as simply standing or walking.



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Dr Claire Steves, lead author and Senior Lecturer in Twin Research at King's College London and King's College Hospital said: 'Everyone

wants to know how best to keep their brain fit as they age. Identical twins are a useful comparison, as they share many factors, such as genetics and early life, which we can't change in adulthood.

'It's compelling to see such differences in cognition and [brain structure](#) in [identical twins](#), who had different leg power ten years before. It suggests that simple lifestyle changes to boost our physical activity may help to keep us both mentally and physically healthy.'

However, more studies are needed to better understand the relationships between measures of fitness such as leg power or aerobic capacity and brain changes, and the specific cause-and-effect of [physical activity](#) on brain structure and cognition. The mechanisms behind this association are not yet clear and could involve other factors such as age-related changes in immune function, blood circulation or nerve signaling.

The study only assessed female participants with an average age at baseline of 55 (range 43–73), so further studies would also be needed to establish whether these findings can be generalized to older or male populations.

More information: Claire J. Steves et al. Kicking Back Cognitive Ageing: Leg Power Predicts Cognitive Ageing after Ten Years in Older Female Twins, *Gerontology* (2015). [DOI: 10.1159/000441029](https://doi.org/10.1159/000441029)

Provided by King's College London

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