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Long Covid causes changes in body that make exercise debilitating – study

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Many people with long Covid feel tired, unwell and in pain for lengthy periods after exercise, and researchers say they now know why.



Experts say they have evidence that biological changes are to blame, such as severe muscle damage, mitochondrial problems and the presence of microclots in the body.

“It’s really confirming that there is something inside the body going wrong with the disease,” said Dr Rob Wüst, an author of the study at Vrije Universiteit (Free University) Amsterdam.

Long Covid is thought to affect tens of thousands of people in the UK alone, and many experience a worsening of symptoms for weeks after a single bout of exercise.

Published in the journal Nature Communications, the study involved 25 patients with long Covid who reported experiencing malaise after exercising, and 21 people who had had Covid but made a full recovery. None of the participants had been hospitalised with Covid, while all had been fit and healthy before catching the virus and were of working age.

Each participant spent about 10-15 minutes on an exercise bicycle, and blood samples and skeletal muscle biopsies were taken a week before and the day after the task.

While there was considerable variation between patients, on average, people with long Covid had a lower exercise capacity than healthy participants.

When the researchers analysed the biopsies taken before exercise, they found that those with long Covid had a greater proportion of white fibres in their muscles than healthy participants. These fibres have fewer powerproducing structures, known as mitochondria, within their cells, and fewer capillaries.

The team also found signs that the mitochondria in people with long Covid did not work as well as those in healthy participants.

Wüst said the findings partly explained why people with long Covid had a lower capacity for exercise.

The team also found that people with long Covid had more clumps of a protein called amyloid in their skeletal muscles, although there was no evidence that these "microclots" were blocking blood vessels as some researchers have previously proposed.

Comparison of the biopsies taken before and after cycling revealed the function of the mitochondria worsened after exercise in those with long Covid, and these participants had far more tissue damage after exercising and signs of the body attempting repairs.

"That can explain, for instance, the muscle pain that these patients are experiencing after exercise," said Wüst.

He said the findings highlighted that people with long Covid should not undertake intense exercise.

"It damages your muscles, it worsens your metabolism, and it can explain why you feel muscle pain and fatigue up to weeks after the exercise," he said.

Prof Betty Raman, of the University of Oxford, who was not involved in the study, said her own research suggested that mitochondrial dysfunction might play a role in the fatigue that some people with long Covid experience. The latest study adds weight to the idea that treatments that improve mitochondrial health could be beneficial, she said.

But, Raman noted, this might not be the full story: "While it is plausible that fatigue is associated with these metabolic abnormalities, other contributing factors, such as persistent inflammation, may also play a role."