

# More muscle for the argument to give up smoking

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Researchers at The University of Nottingham have got more bad news for smokers. Not only does it cause cancer, heart attacks and strokes but smokers will also lose more muscle mass in old age than a non-smoker. The effect of this predisposes smokers to an accelerated decline in physical function and loss of independence.

Research has already established that smokers tend to have a lower muscle mass than non-smokers but no one has been able to explain why.

Now, Michael Rennie, a Professor of Clinical Physiology, and Dr Philip Atherton, a Research Fellow, both from the university's School of Graduate Entry Medicine and Health at Derby, have, with collaborators in Denmark and the USA, discovered that smoking impairs the day to day upkeep of muscle. Their research shows that smoking is likely to speed up a condition known as sarcopenia – the loss of muscle mass with ageing which is linked to poor balance, gait speed, falls, and fractures.

16 people took part in the study which was part funded by the Biotechnology and Biological Sciences Research Council. The men and woman in their mid sixties were selected because of their similar lifestyles in terms of alcohol consumption and physical activity. They were all considered to be healthy, with no symptoms of lung disease. They were studied in two equal groups: heavy smokers, who had smoked at least a pack of 20 cigarettes a day for at least 20 years: and non-smokers.

To measure the synthesis of muscle protein they were given an intravenous infusion of blood with a tagged amino acid (one of the building blocks of protein). Samples of muscle were taken from their thighs before and after the infusion to follow how much had “stuck” in muscle protein. This measured the rate of synthesis of muscle protein which contributes to the daily maintenance of the muscle mass. The researchers found that it was substantially less in smokers than non-smokers.

During extensive studies, carried out in collaboration with Washington University, St Louis and Copenhagen University, Professor Rennie and Dr Atherton discovered that the amounts of myostatin, a muscle growth inhibitor and MAFbx enzyme, which breaks down muscle protein, were higher in smokers than non-smokers.

Dr Philip Atherton said: “From our tests, we can conclude that smoking slows the muscle protein synthesis machinery — probably impairing day to day upkeep of muscle. We are all well aware of the ill affects of smoking on the lungs but our study reveals yet another cause of ill-health associated with smoking. Hopefully the UK smoking ban will encourage people to quit while they are still young, helping them to keep in good health in later life”.

Source: University of Nottingham

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