Harder to predict heart problems among smokers

A method for testing whether you run a high risk of a heart attack seems to be less reliable if you are a smoker.

A decreasing number of Norwegians are dying of cardiovascular diseases. However, they are still the group of ailments that takes the most lives in Norway.

Medical science has improved ways of predicting who will develop cardiovascular disease in the course of their lives. In a new study, Norwegian researchers have looked at one of the prognostic methods used: measuring blood levels of the protein cardiac troponin I.

They found something that surprised them. Smokers had generally lower, and seemingly less risky, levels of cardiac troponin I. As smoking is known to be closely linked with cardiovascular diseases, the researchers had expected them to have high and dangerous levels of this protein.

But they didn’t. Magnus Nakrem Lyngbakken says these findings were just the opposite of what was expected. He is a doctor at Akershus University Hospital and one of the researchers behind the study.

“Smokers have lower levels of troponin and we don’t understand why. One would expect smoking to link to higher levels.”

Troponin is a type of protein used to diagnose acute myocardial infarctions – heart attacks. A low level of the protein is thought in indicate less risk of the heart disease, whereas a high level means a person runs an elevated risk of incurring a heart attack, heart failure or cardiovascular death in the future.

The new study suggests that this indicator protein cannot be used for predicting future health problems amongst smokers.

Unsure of the reason

The troponin study comprised part of Lyngbakken’s PhD thesis at the University of Oslo (UiO). He conducted it together with researchers from UiO, Akershus University Hospital and the Norwegian University of Science and Technology (NTNU). Their point of departure was data from the Nord-Trøndelag Health Study (HUNT2).

The troponin levels of several thousand persons without heart disease were tested and their health conditions were followed up 14 years later.

The authors of the study have some preliminary theories about what could be giving smokers lower levels of cardiac troponin I.

For instance: Smokers generally have less overall muscle mass than non-smokers. As a potential explanation then, the left ventricles of smokers’ hearts tend to be smaller than amongst non-smokers. This could in turn
could explain lower levels of troponin in their blood.

Lyngbakken thinks another possible explanation could be among the compounds found in tobacco smoke.

“There are thousands of substances in tobacco smoke. It might be that some of these can have an impact on the release, decomposition or secretion of troponin amongst smokers. But we cannot say which substance or substances these might possibly be,” he says.

Providing better insights

Helge Istad is a health advisor about cardiovascular diseases for the Norwegian Heart and Lung Association (LHL). He thinks the study contributes valuable knowledge about the consequences of smoking.

“This is important knowledge. It shows that tobacco smoke is still dangerous. But it impacts through other mechanisms than we have thought,” says Istad, who is an internal medicine specialist.

LHL’s information page on heart attacks informs that troponin is released by damaged heart muscles and can thus be used to confirm or rule out whether a heart attack has occurred.

Istad thinks that when it comes to smokers’ risk of cardiovascular diseases, the findings show the problem is not a direct impact on the heart muscle tissue. Instead, smoking could be making thrombocytes – platelets or blood-clot cells – stick together more readily. This can in turn raise risks of clogged arteries and lead to acute myocardial infarctions.

Moreover, Istad thinks that smoking appears to decrease levels of “the good cholesterol”, HDL cholesterol. He says that lower levels of HDL cholesterol can, for example, make it easier for a person to incur a hardening of the arteries, which in turn can lead to heart attacks.

Not necessarily a sign of disease

New methods have enabled doctors to measure troponin levels in the general population, not just amongst patients with suspected infarcts. This makes it theoretically possible to use these measurements in an attempt to predict the risk of a future cardiovascular disease.

In practice, today, such measurements are only used diagnostically. More specifically, the troponin level of patients is tested when they arrive at emergency wards with chest pains. If doctors suspect an acute myocardial infarction they will measure the patient’s troponin level. If the level is high in repeated assessments, they can attribute this to an infarct.

The method is not used as a general prognostic tool. You cannot go to your MD in Norway today and ask to have your troponin level tested in hope of learning about a prospective future disease development.

Helge Istad at LHL thinks such tests might become common in the future, but it is uncertain how useful they will be in detecting all cases.

“I think troponin will start being assessed more widely than in heart attack diagnostics. But these findings indicate that this is complicated. Among other things we would have to factor in whether the patient is or isn’t a smoker.”

Still harmful to smoke

Both Lyngbakken and Istad are surprised by the discovery, but they stress that smoking is no less dangerous
than believed. Lyngbakken says that the findings by no means undermine the link the between smoking and cardiovascular diseases.

“No, absolutely not. Those who smoke run a high risk, just by smoking. Globally, only hypertension represents a higher risk factor of cardiovascular disease than smoking.”

“Nobody now denies that it is extremely harmful to smoke. We have overwhelming, irrefutable epidemiological evidence that smoking leads to cardiovascular disease,” says Lyngbakken.

Read the Norwegian version of this article at forskning.no

A new study indicates that it could be harder among smokers than non-smokers to use a protein to assess risk of cardiovascular disease. (Photo: Nikodash/Shutterstock/NTB scanpix)

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Magnus Nakrem Lyngbakken's profile


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