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Press Release

4. December 2019

International study on the risk of heart attacks

UKE researchers have developed a model to calculate the long-term cholesterol-dependent risk of heart attack.

To a larger extent than previously considered in medicine, elevated levels of cholesterol increase the long-term risk of suffering a heart attack; in particular for young people. This has been proven by a study completed by researchers at the University Heart & Vascular Centre. The cardiologists working with Prof. Dr. Stefan Blankenberg, the Medical Director of the University Heart & Vascular Centre, have developed a model that can be used to calculate the cholesterol-dependent heart attack risk up to the age of 75. Today the medical journal The Lancet published their international study.

The study shows that the cholesterol which causes cardiovascular diseases is an excellent predictor of cardiovascular incidents such as heart attacks or strokes, even if they may only occur in the decades to come. This cholesterol does not belong to the "good" HDL cholesterol and is measured in the blood as a non-HDL value.

The cardiologists' new risk model applied in long-term projection shows that even a slightly elevated non-HDL level between 3.7 and 4.8 millimoles per litre (3.7 to <4.8 mmol/litre approximately corresponds with 145 to <185 miligrammes per decilitre – 145-<185 mg/dl – which is the measurement customarily used in Germany) increases the heart attack risk for a 40-year-old woman by the factor of 1.8. The risk for a man of the same age is doubled compared to persons without increased levels of cholesterol. However, cholesterol at the same level together with other factors such as diabetes or smoking, means that suffering a heart attack or a stroke at some point can reach probability levels of up to 29%. "The unfavourable effect of blood lipids on vessels seems to accumulate with increasing age, which means that even minor limit value transgressions can have negative effects over the years; this applies in particular to younger people," said Dr. Fabian Brunner, who works at the Department of Cardiology and is one of the lead authors of the study.

Considering lifetime risk when deciding on therapy for minor cholesterol increases

So far, the risk of heart attacks for persons with elevated levels of blood lipids has only been calculated for the subsequent ten years, which frequently did not show any increased risks, in particular where young people were concerned. On the basis of the completed study, it is now possible to approximately predict the lifetime risk.

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With the newly developed risk model, the researchers have also calculated the hypothetical risk for the same people with a non-HDL figure reduced by 30 or 50 percent. This significantly reduces the risk of heart attacks. For a 40-year-old man with no additional risk factors, this means a decrease from 19 to approximately 4 percent. Every day, uncountable patients and doctors face the decision of implementing cholesterol-reducing measures such as statin medication. In such situations, the model developed by the Hamburg cardiologist can assist in the decision-making process. "The risk calculators used so far might underestimate the relevant lifetime risks for young patients. So far, treatment studies on cholesterol reduction in primary prevention have merely given an indication for some years although the application of preventive measures constitutes a lifelong challenge. Our model closes a gap in knowledge and enables us to illustrate the individual long-term risk and the potential long-term benefit of reducing cholesterol," said Dr. Christoph Waldeyer, who works at the Department of Cardiology and is also one of the lead authors.

Data from 38 studies from 19 countries produced robust results

The data analyses that run for three years are based on a harmonised model that considers data from the USA and Australia in addition to data from European countries. "This population-based study, which is the most extensive to date, is special as it used raw data from databases worldwide instead of previously published results," Prof. Dr. Stefan Blankenberg, the Medical Director of the University Heart & Vascular Centre, emphasised. The data of some 400,000 participants in 38 prospective population-based studies from 19 countries allowed to draw conclusions on the development of cardiovascular diseases in relation to the cholesterol levels measured in the participants in the studies over a period of up to 43 years. "This provides very good assistance in decision-making on therapy when communicating with patients on the issue of preventing cardiovascular diseases," emphasised Blankenberg.

Literature

Brunner, F. J., Waldeyer, C., Ojeda, F. et al. Application of non-HDL cholesterol for population-based cardiovascular risk stratification: results from the Multinational Cardiovascular Risk Consortium. DOI: https://doi.org/10.1016/S0140-6736(19)32519-X

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The University Medical Centre Hamburg-Eppendorf (UKE)

Founded in 1889, the UKE is one of Europe´s most modern clinics and with more than 11,000 employees one of Hamburg's largest employers. Together with its University Cardiovascular Centre and the Martini Clinic, the UKE has more than 1,730 beds and treats approximately 507,000 patients per year. Its areas of research focus include neurosciences, cardiovascular research, healthcare research, oncology, and infections and inflammations. The UKE trains approximately 3,300 doctors and dentists at its Medical Faculty.

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