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CAC + carotid artery intima-media thickness for better stroke prediction

Current guidelines suggest treatment for many individuals who may never develop a stroke. According to a new study, the combination of coronary artery calcification (CAC) and carotid artery intima-media thickness (CIMT) data could serve to further refine risk calculation for stroke prevention and may prioritise those in most need of statin therapy to reduce ischaemic stroke/transient ischaemic attack risk.

CAC is an independent risk predictor of atherosclerotic cardiovascular disease (ASCVD) that can improve discrimination for ASCVD in asymptomatic individuals beyond prevalent risk prediction tools. Similarly, CAC could specifically predict stroke; however, its discriminative value for stroke is still controversial.

Meanwhile, ischaemic stroke is often attributable to carotid artery atherosclerosis, and CIMT may predict ischaemic stroke. Researchers hypothesised the combination of CIMT and CAC information may better classify ASCVD risk and thus could indicate eligibility for statin use to reduce ischaemic stroke and transient ischaemic attack (TIA) risk.

For this study, 4,720 individuals from the Multi-Ethnic Study of Atherosclerosis (MESA) were evaluated for ischaemic stroke and TIA. Participants (aged 45–74 years) did not use lipid-lowering medications and had complete lipid-lowering medication data and LDL level and risk factor information. Cox proportional hazards models for time to incident ischaemic stroke/TIA were used to examine CAC and CIMT as ischaemic stroke/TIA predictors in addition to traditional risk factors. Researchers calculated the 10-year number needed to treat by applying the benefit observed in ASCOT-LLA to the observed event rates within CAC and CIMT strata.

The study's median follow-up was 13.1 years. Compared with individuals with no CAC and with CIMT ≤ 75th percentile, stroke/TIA risk increased progressively with each CAC category (0, 1–100, >100) among individuals with CIMT > 75th percentile. Among participants eligible for statin therapy based on the 2013 ASCVD guidelines (ASCVD risk of >5%), 739/2,906 (25%) had no CAC and CIMT ≤ 75th percentile and an observed ischaemic stroke/TIA rate of 2.49 per 1,000 person-years. The predicted 10-year number needed to treat was 292 for no CAC and CIMT ≤ 75th percentile and 57 for CAC > 100 and CIMT > 75th percentile.

"The rate of 10-year ischaemic stroke/TIA events was 1.27% in individuals with no CAC and CIMT ≤ 75th percentile, which was lower than that when individuals with no CAC were assessed without consideration of CIMT (1.62%). The combination of CAC and IMT thus seems able to identify a very low risk group (although either measure does fairly well on its own). Thus, those with CAC = 0 and CIMT ≤ 75th percentile could be potentially free from preventive statin therapy for ischaemic stroke/TIA, whereas those with CAC = 0 and CIMT > 75th percentile may be considered for preventive statin therapy for ischaemic stroke/TIA," the authors explain.

As the study population in this analysis was missing a large number of individuals at high or very high CVD risk because participants on lipid-lowering drugs were excluded, the authors say this may limit the external validity of the study.

Source: European Journal of Preventive Cardiology
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Published on : Thu, 13 Sep 2018