CIGARETTE SMOKING, PROXIMAL CORONARY ARTERIAL PLAQUE COMPOSITION, AN RISK OF MYOCARDIAL INFARCTION AND DEATH: A STUDY OF NONDIABETIC MEN AND WOMEN IN THE MULTINATIONAL CONFIRM REGISTRY (CORONARY CT ANGIOGRAPHY EVALUATION FOR CLINICAL OUTCOMES: AN INTERNATIONAL MULTICENTER REGISTRY)

ACC Oral Contributions
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Authors: Victor Cheng, Daniel S. Berman, Allison L. Dunning, Stephan Achenbach, Mouaz Al-Mallah, Matthew J. Budoff, Filippo Cademartiri, Tracy Q. Callister, Hyuk-Jae Chang, Kavitha M. Chinnaiyan, Benjamin J W Chow, Augustin J. Delago, Martin Hadamitzky, Joerg Hausleiter, Philipp Kaufmann, Fay Y. Lin, Khurram Nasir, Gil Raff, Leslee J. Shaw, Todd C. Villines, James K. Min, Cedars-Sinai Medical Center, Los Angeles, CA

Background: Acute coronary syndromes occur more frequently in smokers and in patients who exhibit coronary atherosclerotic plaques low in calcium content (often termed “mixed” plaque [MP] and “noncalcified” plaque [NCP]) on coronary CT angiography. How cigarette smoking relates to MP and NCP and the impact of this relationship on adverse outcomes have not been established.

Methods: Out of 8292 patients without prior coronary artery disease who provided complete symptom, risk factor, smoking status, and statin use data, we evaluated 3434 consecutive 40-69 year-old nondiabetic patients (1838 men, 362 active smokers; 1596 women, 209 active smokers) not on statin therapy at the time of coronary CT angiography. Experienced readers examined CT images for the presence of calcified plaque (CP, contains only calcium), MP (contains calcified and noncalcified components), and NCP (contains no visible calcium) in the proximal coronary artery (ProxCA) segments. Patients were followed after CT for myocardial infarction and all-cause death.

Results: Active smokers were more likely to have ProxCA MP than non-smokers (men, 23% vs. 15%, p<0.001; women, 11% vs. 7%, p=0.02). Female active smokers were also more likely to have ProxCA NCP (9% vs. 5%, p=0.027). MP made up a greater percentage of total number of detectable plaques in actively smoking men (42% vs. 34% in non-smokers, p<0.001), with a similar trend in women (34% vs. 26%, p=0.15). After adjusting for age, hypertension, dyslipidemia, and family coronary disease history, active smoking was associated with ProxCA MP (OR 1.76, 95%CI 1.32-2.41) in men and ProxCA MP (OR 1.76, 95%CI 1.08-2.88) and NCP (OR 1.74, 95%CI 1.02-2.99) in women. At a median follow-up of 2.6 years, active smokers with ProxCA MP experienced more than 4-fold higher annualized rates of myocardial infarction or death when compared to active smokers without ProxCA MP, non-smokers with ProxCA MP, and non-smokers without ProxCA MP (3.2%, 0.3%, 0.8%, 0.4%, p<0.001 for men; 4.2%, 0.7%, 0.5%, 0.4%, p=0.007 for women).

Conclusion: Active cigarette smoking is robustly associated with an increase in ProxCA MP, which in turn predicts an elevated rate of subsequent myocardial infarction and death.