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Objectives Cigarette smoking is an independent risk factor for cardiovascular disease. The ATP-binding cassette transporters A1 (ABCA1) and G1 (ABCG1) mediated cholesterol efflux initiate reverse cholesterol transport and play a pivotal role in keeping lipid homeostasis of macrophage. Accordingly, we investigated the ABCA1 and ABCG1 expression and function in cholesterol efflux from macrophages of cigarette smoke exposure in coronary artery disease patients.

Methods This is a randomised, prospective and parallel controlled study. All the subjects, including 17 healthy non-smokers, 35 healthy chronic smokers and 32 CAD smokers, were recruited in Peking Union Medical College Hospital (PUMCH) (Beijing, China). Smoking subjects eligible for this study included individuals aged 40–80 years who smoked regularly for at least 10 years with at least 10 cigarettes/day. Smoking subjects were randomly assigned in a 1:1 ratio to either smoking cessation subgroup or continued smoking subgroup. Smokers randomised into smoking cessation subgroup were asked to stop smoking for at least 90 days. CAD smokers were asked to stop statin therapy for at least 2 weeks before randomised into subgroups. Cotinine concentration in urine and the carbon oxidises (CO) of expiration were tested to insure the compliance of study. There were 14 healthy smokers and 13 CAD smokers finished 90 days smoking cessation. Blood samples were collected from all subjects. Peripheral blood monocyte cells were differentiated into macrophages, real time PCR and immunoblots were performed and cellular cholesterol efflux were tested to evaluate ABCA1 and ABCG1 expression and function in macrophages from subjects.

Results We found that ABCA1 expression, as well as its function in mediating cholesterol efflux to apoA-1, was decreased in macrophages from both healthy and CAD smokers compared with those from non-smokers at the baseline. There was no obvious difference in ABCG1 expression in all three subgroups. Both HDL-cholesterol and apoA-1 levels were substantially lower in plasma from smoking subjects compared with that in non-smokers. ABCA1 expression and its function in mediating cholesterol efflux were reversed by 3 months smoking cessation in CAD subgroup. In contrast, ABCA1 expression and function were not apparently improved in healthy smoking subjects after 3 months tobacco cessation. ABCG1 expression did not change after smoking cessation in each group. ABCA1 mRNA and protein expression was disturbed by nicotine, rather than carbon monoxide. Mecamylamine which is a selective antagonist of α-7 nicotinic acetylcholine receptor (nAchR) abrogated nicotine induced inhibition of ABCA1.

Conclusions ABCA1 mediated intercellular cholesterol efflux is attenuated by chronic cigarette smoking. ABCA1 expression as well as its function could be reversed by 3 months tobacco abstinence in CAD patients. Nicotine induced down-regulation of ABCA1 expression can be abrogated by Mecamylamine.

Lipid research

GW23-e0612 **THE IMPLICATION OF CIGARETTE SMOKING AND SMOKING CESSATION ON MACROPHAGE CHOLESTEROL EFFLUX IN CORONARY ARTERY DISEASE PATIENTS**

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