Effect of cigarette smoke on vascular integrity: the role of circulating miRNAs

Tobacco smoking is a relevant cardiovascular risk factor, dramatically associated with adverse and potentially fatal cardiovascular events. Smoking habits are closely linked to the onset of other cardiovascular risk factors too, such as hypertension, atherosclerosis and coronary heart diseases. The mechanisms behind the vascular injury mediated by smoke, is not entirely clear.

Recent investigation on patients’ vascular response to tobacco smoke showed that vascular wall responds to acute tobacco smoke exposure (1). We investigated the effects of smoking one cigarette on the circulating miRNA expression and found that specific miRNAs are deregulated. Some have a known function in vascular cells response to stress and some have a more general role in cardiovascular homeostasis. We have dissected the role of one of the deregulated miRNAs, miR-155, found upregulated in serum after cigarette smoke. We found a causative role of miR-155 overexpression in mediating endothelial function impairment (2). We are currently investigating the role of other three miRNAs increased in serum after cigarette smoke on endothelial function and cardiac repair.

References:
2. Giacomo Frati, Maurizio Forte, Flavio di Nonno, Antonella Bordin, Isotta Chimenti, Vittorio Picchio, et al., Francesca Pagano* and, Sebastiano Sciarretta*. Inhibition of miR-155 attenuates detrimental vascular effects of tobacco cigarette smoking. Manuscript accepted for publication. JAHa. 2020

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