

*Original article*

## Acute Effects of Smoking on Heart Rate and Peripheral Resistance in Young Smokers

Ana Mrkaić<sup>1</sup>, Suzana Branković<sup>1</sup>, Pavle Randjelović<sup>1</sup>,  
Milica Veljković<sup>1</sup>, Ivan Pavlović<sup>2</sup>, Mirjana Radenković<sup>1</sup>

<sup>1</sup>University of Niš, Faculty of Medicine, Department of Physiology, Niš, Serbia

<sup>2</sup>University of Belgrade, Faculty of Pharmacy, Department of Pharmacognosy, Belgrade, Serbia

### SUMMARY

Smoking has many harmful effects on human body. It is well known that smoking is one of the most important risk factors for cardiovascular diseases. Though the ingredients from cigarette smoke stimulate the release of vasoconstrictor and reduce the release of vasodilator substances, the goal of this study was to investigate the acute effects of smoking on arterial blood pressure, heart rate and blood vessel flow.

The investigation was conducted on forty healthy volunteers divided into two groups of twenty non-smokers (control group), and twenty smokers (experimental group). The group of smokers was examined before and after smoking four cigarettes during one hour. Blood pressure and electrocardiograph (ECG) were measured by common methods. Brecht's and Boucke's methods of plethysmography were used to evaluate the peripheral circulation.

There were no differences in measured systolic and diastolic blood pressure and recorded ECG between non-smokers and smokers, neither between smokers before and after smoking. However, heart rate was increased by 29.57% after smoking in comparison to the value before smoking.

Evaluation of plethysmographic parameters showed that amplitude was significantly decreased. Parameters of peripheral resistance were very increased: ductility was decreased by over 20%.

It can be concluded that acute smoking does not significantly affect the level of blood pressure, although it increases heart rate. The shape of plethysmograms showed decreased systolic filling and decreased diameters of blood vessels.

*Key words:* smoking, heart rate, ECG, plethysmography

Corresponding author:

Mirjana Radenković

email: mirjanakos@medfak.ni.ac.rs