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Effect of Conventional versus Electronic Cigarettes Use on Renal Histology of Rats Induced by High Fat Diet

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Objectives: Chronic kidney disease is when the kidneys do not work as well as they should. It is a progressive condition affecting more than 800 million individuals worldwide. The primary risk factor for this condition is an unhealthy lifestyle like high-fat diet consumption and smoking habits (conventional and electronic cigarettes). Histological changes in a kidney characterize CKD. Therefore, this study aimed to identify the effect of conventional and electronic cigarettes on renal histological changes in rats induced by a high-fat diet.

Methods: This study was conducted using a true experimental method with a post-test-only randomized control group design. 28 male Wistar rats aged 1-2 months were randomly divided into four groups, namely normal (N), high-fat diet (HFD), high-fat diet and conventional cigarettes (HFDR), and high-fat diet and electronic cigarettes (HFDV). HFD used in this study was the mixture of egg yolk and oxidized palm oil with a ratio of 2: 3. It was given 2 mg/day. The intervention of conventional and electronic cigarettes was using a smoke exposure chamber. The dose of nicotine used in HFDR and HFDV groups was 12 mg/day. Renal histological changes were observed after seven weeks of intervention.

Results: The observation using a microscope showed no differences between normal and intervention groups. All of the groups showed histology of normal glomerulus without sclerosis. The renal tubules showed dense epithelial cells without degeneration or necrosis. In addition, in the glomerulus and tubules, there was no inflammation found. This condition may be caused by the duration of the study, which was too short to change the renal structure.

Conclusions: There was no effect of conventional and electronic cigarettes with a nicotine dose of 12 mg/day after seven weeks of intervention on the renal histology of HFD-induced rats.

Figure 1. Renal Histological Change of Rat