UNIVERSITI TEKNOLOGI MARA

PRELIMINARY STUDY OF CATALASE ENZYME ACTIVITY IN BLOOD PLASMA OF VAPING, SMOKING AND HEALTY SUBJECTS

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ABSTRACT

Tobacco smoking has been associated with various degenerative pulmonary and cardiovascular diseases. This is due to the 4000 different chemicals that make up the cigarette which promotes oxidative stress. Smokers find it difficult to quit even with the help of nicotine replacement therapy. With the introduction of E-cigarette, they found a new light to quit smoking. The potential of E-cigarette to cause oxidative stress has not been established. This study seeks to investigate the effects of vaping to oxidative stress. Catalase (CAT) assay kit is used to measure oxidative stress in treatment groups. One-way Analysis of Variance (ANOVA) showed that there are statistically significant differences between the treatment groups. There were no statistically significant difference between the vaping group when compared with the smoking group (p = 0.108). Similarly when comparing vaping groups and healthy group, there were no statistically significant difference in CAT activity (p = 0.154). However, there were statistically significant difference between healthy group and smoking group. (p = 0.002). Therefore, no definite evidences that can be concluded in this research to suggest that vaping may cause oxidative stress. Further research need to be carried out to validate the results of this preliminary study.

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CHAPTER 1

INTRODUCTION

1.1 Background Study

Cigarette smoking is a major public health issue worldwide placing an enormous burden on the United State (US) economy (Tweed, Hsia, Lutfy, & Friedman, 2012). Cigarette Smoking has been implicated in various degenerative pulmonary and cardiovascular diseases such as bronchitis, emphysema, myocardial infarction, lung cancer and arthrosclerosis (Menegali et al., 2009; Pasupathi, Bakthavathsalam, Rao, & Farook, 2009). Cigarette Smoking have been reported to contain numerous toxic compounds that increase oxidative stress and reactive oxygen species (ROS) production in vivo (Mandraffino et al., 2010). The high concentrations of free radicals and ROS which is found in cigarette smoke induce oxidative stress in several organs in the body (Campos et al., 2013).

Oxidative stress occurs when imbalance exists between the production of oxidants and the levels of antioxidants in the biological system (Baronetti, Villegas, Aiassa, Paraje, & Albesa, 2013). Oxidative damage can lead to the development of many diseases (Hapner, Deuster, & Chen 2010). For instance Tonon et al., (2012) mentioned that those who have oxidative damage showed a high tendency to develop cardiovascular diseases, atherosclerosis, diabetes, anemia, cancer, and aging later in