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ANALYSIS OF NICOTINIC RECEPTOR GENES IN NICOTINE REPLACEMENT TREATMENT

V. De Luca, *L. Zawertailo, J.L. Kennedy, P. Selby*
CAMH, Toronto, ON, Canada

Nicotine replacement therapy (NRT) in the form of patches, gum or inhaler is the most popular treatment for quitting smoking. However, NRT is effective for only a fraction of smokers. Therefore, research is needed to maximize the successful treatment of smokers who want to quit. The purpose of this study is to examine the role of inherited genetic variation in the therapeutic response to NRT. The specific aim of this project is to examine the role of genetic variation in the alpha5 nicotine receptor subunit in NRT treatment success or failure. This nicotine receptors are the main sites of action of nicotine that contribute to tobacco dependence. Study subjects were 403 participants in a stop smoking study examining the effectiveness of different types of NRT on smoking cessation. Subjects received 10-weeks of NRT treatment and their quit success was assessed at the end-treatment. The DNA extracted from blood samples was tested for the D398N variation in the gene that encode for the nicotinic receptors α5. We found a slight trend (p=0.107) for the allele N398 associated with treatment response (44% in quitting group versus 37% in the relapsing group). This study is one of the first to investigate the link between treatment success with NRT and the genetics of nicotine receptor in the Ontario population. This study confirms the link between CHRNA5 and nicotine dependence, however replications in larger samples are necessary to confirm that this marker will provide an evidence-base for individualizing treatment in smoking cessation.

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