

## Diversity and Distribution of Cytochrome P450 2C9 Genes Related with Medical Cannabis in Thai Patients

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**Abstract :** Introduction: These days, cannabis is being accepted in many countries due to the fact that cannabis could be use in medical. The medical cannabis is used to treat and reduce the pain many diseases. For example, neuropathic pain, Parkinson, autism disorders, cancer pain reduce the adverse effect of chemotherapy, diabetes, and migraine. Active ingredients in cannabis that modulate patients' perceptions of their conditions include  $\Delta$ 9-tetrahydrocannabinol (THC), cannabidiol (CBD), flavonoids, and terpenes. However, there is an adverse effect of cannabis, cardiovascular effects, psychosis, schizophrenia, mood disorder, and cognitive alternation. These effects are from the THC and CBD ingredients in the cannabis. The metabolize processes of delta-9 THC to 11-OH-delta 9 -THC (inactive form), THC were cause of adverse effects. Interestingly, the distributions of CYP2C9 gene (CYP2C9\*2 and CYP2C9\*3, poor metabolizer) that might affect incidences of adverse effects in patients who treated with medical cannabis. Objective: The aim of this study we want to investigate the association between genetic polymorphism of CYP2C9 frequency and Thai patients who treated with medical cannabis. Materials and Methods: We recruited sixty-five unrelated Thai patients from the College of Pharmacy, Rangsit University. DNA were extracted using Genomic DNA Mini Kit. Genotyping of CYP2C9\*2 (430C>T, rs1799853) and CYP2C9\*3 (1075A>C, rs1057910) were genotyped by the TaqMan Real-time PCR assay. Results: Among these 31 medicals cannabis-induced ADRs patients, they were diagnosed with 22 (33.85%) tachycardia and 3 (4.62%) arrhythmia. There were 34 (52.31%) medical cannabis-tolerant controls who were included in this study. 40 (61.53%) Thai patients were female, and 25 (38.46%) were male, with median age of 57 (range 27 - 87) years. In this study, we found none of the medical cannabis-induced ADRs carried CYP2C9\*2 variant along with medical cannabis-tolerant control group. CYP2C9\*3 variant (intermediate metabolizer, IM) was found just only one of thirty-one (3.23%) in the medical cannabis-induced ADRs and two of thirty-fourth (5.88%) in the tolerant controls. Conclusions: Thus, the distribution of CYP2C9 alleles offer a comprehensive view of pharmacogenomics marker in Thai population that could be used as a reference for worldwide to investigate the pharmacogenomics application.

**Keywords :** medical cannabis, adverse effect, CYP2C9, thai patients

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