

Distribution of Cytochrome P450 Gene in Patients Taking Medical Cannabis

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Abstract : Introduction: Medical cannabis can be used for treatment, including anorexia, pain, inflammation, multiple sclerosis, Parkinson's disease, epilepsy, cancer, and metabolic syndrome-related disorders. However, medical cannabis leads to adverse effects (AEs), which is delta-9-tetrahydrocannabinol (THC). In previous studies, the major of THC metabolism enzymes are CYP2C9. Especially, the variation of CYP2C9 gene consist of CYP2C9*2 on exon 3 (C430T) (Arg144Cys) and CYP2C9*3 on exon 7 (A1075C) (Ile359Leu) to decrease enzyme activity. Notwithstanding, there is no data describing whether the variant of CYP2C9 genes are a pharmacogenetics marker for prediction of THC-induced AEs in Thai patients. Objective: We want to investigate the association between CYP2C9 gene and THC-induced AEs in Thai patients. Method: We enrolled 39 Thai patients with medical cannabis treatment consisting of men and women who were classified by clinical data. The quality of DNA extraction was assessed by using NanoDrop ND-1000. The CYP2C9*2 and *3 genotyping were conducted using the TaqMan real time PCR assay (ABI, Foster City, CA, USA). Results: All Thai patients who received the medical cannabis consist of twenty four (61.54%) patients who were female and fifteen (38.46%) were male, with age range 27- 87 years. Moreover, the most AEs in Thai patients who were treated with medical cannabis between cases and controls were tachycardia, arrhythmia, dry mouth, and nausea. Particularly, thirteen (72.22%) medical cannabis-induced AEs were female and age range 33 - 69 years. In this study, none of the medical cannabis groups carried CYP2C9*2 variants in Thai patients. The CYP2C9*3 variants (*1/*3, intermediate metabolizer, IM) and (*3/*3, poor metabolizer, PM) were found, three of thirty nine (7.69%) and one of thirty nine (2.56%) , respectively. Conclusion: This is the first study to confirm the genetic polymorphism of CYP2C9 and medical cannabis-induced AEs in the Thai population. Although, our results indicates that there is no found the CYP2C9*2. However, the variation of CYP2C9 allele might serve as a pharmacogenetics marker for screening before initiating the therapy with medical cannabis for prevention of medical cannabis-induced AEs.

Keywords : CYP2C9, medical cannabis, adverse effects, THC, P450

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