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ADVERSE EFFECTS OF FENTANYL AND GENETIC POLYMORPHISMS IN THE ABCB1 GENE IN KOREANS

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P-glycoprotein is a polymorphic transporter encoded by the ABCB1 gene that contributes to the access of xenobiotics into the brain. There is no report on associations between genetic polymorphisms in ABCBI and the clinical effects of fentanyl, although fentanyl may be a substrate of P-glycoprotein.126 unrelated Korean patients under spinal anesthesia with intravenous fentanyl were recruited. Clinical effects were monitored and these were compared between genotypes for three single nucleotide polymorphisms in ABCB1 (1236C>T, 2677G>T/A and 3435C>T). The allele and genotype frequencies were similar to previous data from Asians; the three major haplotypes, TTT (30%), TGC (24%) and CGC (24%), were expected among nine known haplotypes. During the initial 10 minutes, there were differences in suppression of respiration rate by fentanyl among the three genotypes, but the differences in bispectral index among genotypes were not observed. Furthermore, patients carrying the linked 3435T and 2677T alleles showed a significant difference in level of respiratory suppression; those with genotypes susceptible to fentanyl (1236TT, 2677TT and 3435TT) showed early and profound suppression of respiration compared with other resistant genotypes (1236CC, 2677GG and 3435CC). Also, there was a trend for increased demand by patients carrying both of 1236T and 3435T alleles (P = 0.0847). Our results suggest that analysis of ABCB1 polymorphisms may have clinical relevance to prevent respiratory suppression by intravenous fentanyl or to anticipate its clinical effects.

Key Words: ABCB1, Fentanyl, Genetic polymorphism, Respiratory suppression