The Hydroxylation of Omeprazole Correlates with S-Mephenytoin Hydroxylation in a Korean population

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Racemic mixture of mephenytoin has been used to measure the CYP2C19. However, mephenytoin is not available in Korea, and its sedative effect limits its use in poor metabolizer (PM) in an Oriental population. The purpose of this study was to evaluate the usefulness of omeprazole as a probe drug for S-mephenytoin polymorphism. Single oral doses of omeprazole or mephenytoin were administered at least 2 weeks apart to 50 healthy volunteers. The capacity of S-mephenytoin hydroxylation was measured using the amount of hydroxymephenytoin excreted in 8-hr urine after taking 100 mg of mephenytoin, and omeprazole hydroxylation activity was defined as $\log_{10}$[omeprazole /hydroxyomeprazole] determined in plasma collected 2 hr after taking a 20 mg of omeprazole. Both methods separated PM or extensive-metabolizer (EM) phenotypes of polymorphism with complete concordance. Omeprazole hydroxylation index correlated well ($r=0.861$; $p<0.01$) with the $\log_{10}$% hydroxymephenytoin excreted were also assigned as PMs of omeprazole with the antimode of 1.0. The results suggest that the hydroxylation index of omeprazole appears to be a safe and convenient tool to identify the capacity of S-mephenytoin hydroxylation.