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Lansoprazole and simvastatin reduces the ability of clopidogrel to inhibit platelet aggregation in patients undergoing percutaneous coronary intervention in a tertiary health care system: a prospective drug–drug interaction study

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Clopidogrel, a prodrug is found to be less effective in inhibiting the platelet aggregation when administered along with PPI's and statins in patients undergoing cardiac stent, ST segment elevated Myocardial infarction (STEMI) followed by percutaneous coronary intervention (PCI). Clopidogrel binds to CYP2C19, a hepatic enzyme to get converted to its active metabolite in order to achieve desired pharmacological activity. The cytochrome P450 3A4 which is partially involved in the metabolism of clopidogrel also metabolizes PPIs like omeprazole, lansoprazole and pantoprazole; statins, mainly atorvastatin, rosuvastatin and simvastatin to the greater extent. In the current study, patients on PPI's with dual antiplatelet therapy and patients on PPI's and statins with dual antiplatelet therapy are considered to understand the potential drug–drug interactions (pDDI) among the South Asian population. Platelet aggregation was measured in 91 patients undergoing coronary artery stent implantation treated with clopidogrel and aspirin along with PPI's and statins.

It was observed that lansoprazole and simvastatin, but not omeprazole, pantoprazole and atorvastatin, rosuvastatin, inhibited the antiplatelet activity of clopidogrel. The percent platelet aggregation was 81 ± 2 (p = 0.012), 72 ± 6 (p = 0.001), and 43 ± 23 (p = 0.027) in the presence of clopidogrel with lansoprazole, omeprazole and pantoprazole respectively. Aggregation was found to be 91 ± 4 (p = 0.001), 51 ± 3 (p = 0.009) and 12 ± 23 (p = 0.031) in the presence of clopidogrel with atorvastatin and rosuvastatin respectively.

A prominent drug–drug interaction was observed with patients on dual antiplatelet therapy along with lansoprazole and simvastatin.

Biography

Jinesh Bahubali Nagavi has completed his PhD in Analytical Chemistry at JSS University. He has worked as an Instructor and Lecturer at RAK Medical and Health Sciences University, UAE. He has published more than 15 papers in reputed national and international peer reviewed journals, presented his research work in more than 10 International & national conferences. He has been serving as an Assistant Professor of Pharmaceutical Chemistry at Sarada Vilas College of Pharmacy, RGUHS, Karnataka, India. Dr. Jinesh has special interest in bioanalytical method development and validation with hyphenated techniques, pre-clinical trials, drug interactions, pharmacokinetic studies and clinical research.

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