**CYP2C19 GENETIC VARIATION AND INDIVIDUALIZED CLOPIDOGREL PRESCRIPTION IN A CARDIOLOGY CLINIC**

**S.A. Mirabbasi1,2**, K. Khalighi1,2, B. Khalighi1,3, A. Kodali1,2, Y. Wu1,2, W. Fan1,2

1. Cardiovascular Institute, Department of Medicine, Easton Hospital, Drexel University, Easton, PA, USA

2. Internal Medicine Residency, Department of Medicine, Easton Hospital, Drexel University, Easton, PA, USA

3. Temple University, School of Pharmacy, Philadelphia, PA, USA

*Background*: Cytochrome P2C19 enzymes play a major role in clopidogrel metabolism and may alter their enzymatic activity in patients undergoing cardiovascular procedures. Subsequently the Food and Drug administration (FDA) has recommended genetic evaluation and genotyping of patients requiring clopidogrel as part of their therapy.

*Objectives*: To customize clopidogrel therapy and its efficacy by utilizingCYP2C19 genotypic and phenotypic information to improve clinical outcome in patients.

*Methods*: 465 consecutive patients, who met the enrolment criteria and agreed to participate in this study, were followed for 2 years. The data was then reviewed by a cardiologist and reviewed with each patient, prior to any further dose adjustment or modifications.

*Results*: Of 465 patients, 183 were wild-type homozygotes (\*1/\*1), 87 were heterozygotes (\*1/\*2), 3 were (\*1/\*4), 1 was( \*1/\*8), 1 was ( \*1/\*10), 35 were (\*2/\*17), 1 was (\*8/\*17),1 were (\*9/\*17), 18 were homogygotes (\*2/\*2), 121 were (\*1/\*17) and 14 were (\*17/\*17).Distributions of variant alleles, genotypes and phenotypes were analyzed. Individual clopidogrel recommendation and a follow up plan was made. According to the current guidelines following changes have been made in the past year: 1) switching to prasugrel in Poor metabolizer genotype which improved clinical outcome; 2) Discontinuing or lowering clopidgorel doses in Rapid or Ultra rapid Metabolizer genotype to decrease bleeding risk. For those who were not on clopidogrel but carried abnormal allele(s), “clopidogrel caution” was documented. Patients have been followed up for one year. There were not any cardiac clinical symptoms, cardiac death or excessive bleeding.

*Conclusions*: The relatively high frequencies of both gain-of-function (18.8%) and loss-of-function (19.8%) alleles in our patients make genotyping CYP2C19 clinically relevant. None of the patients had cardiac symptoms after modification which demonstrates that improved the quality of treatment with less complications.