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THE ROLE OF PHARMACOGENETICS IN THE TREATMENT OF CARDIOVASCULAR DISEASES

Pharmacogenetic/ pharmacogenomic (PGx) describes inter-individual variations in drug response, which widely play an important role in drug safety and efficacy, avoiding therapeutic failure. PGx focuses on variations of genes that may affect both drug pharmacokinetic and pharmacodynamic. According to McDonough, in order to determine the cardiovascular PGx candidate genes through different types of studies, the cardiovascular trait or disease state and drug response in patients as the two main factors involving the cardiovascular PGx phenotype, should be primarily considered. Defining the cardiovascular drugs which are used by patient is also known as an important relative factor. The collection of genetic data from the study population, including single nucleotide polymorphisms (SNPs) and genome-wide association studies (GWAS), is one of the main components of cardiovascular PGx studies. [2]. It is worth noting that, there are various organizations which provide clinical PGx guidelines for different sphere of healthcare systems including cardiology; the most popular of which are, Clinical Pharmacogenetics Implementation Consortium (CPIC), Pharmacogenomics Knowledge Base (PharmGKB), European Medicines Agency (EMA), US Food and Drug Administration (FDA) and the American Heart Association/ American College of Cardiology (AHA/ACC) recommendations [1,3]. Notably, FDA provides the list of potential PGx biomarkers in drug labeling, as well as polymorphism in genes which affects drug receptors, transporters and targets (drug-gene interaction) [4]. Definitely, there are multiple genes across the full genome, which are involved in developing cardiovascular diseases, concluding that patients' responses to cardiovascular drugs are polygenic. Recently, published results of Randomized Controlled Trials (RCTs) have proven a marked improvement in patients' outcomes after PGx-guided cardiovascular drug therapy such as Warfarin therapy [3]. In conclusion, implementation of cardiovascular pharmacogenomic information in clinical practice, focusing on clopidogrel, statins, and warfarin may optimize cardiovascular therapies for patients.

References:

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