

A study of clinical pharmacogenetics

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DESCRIPTION

Pharmacogenetic is the study of variation in the targeted genes or group of genes for variability in drug response. Pharmacogenetic is also defined as the study of inherited variation in drug metabolizing enzyme and drug responses. All proteins are gene products and many exhibit genetic polymorphism. Single Nucleotide Polymorphisms (SNPs), gene deletions, and gene amplifications determine protein structure, configuration concentration. The term pharmacogenetic was coined by Vogel in 1959. Pharmacogenetic derived from two words Pharmakon which means drug and Genetikos which means generative.

Pharmacogenetics is of 2 phenotypes:

1. Variation affecting pharmacokinetics.
2. Variation affecting drug receptor or target.

The pharmacokinetics of a drug can be changed by sequence variation in drug disposition genes. The pharmacodynamics of a drug can be changed by the sequence variation in drug target genes. Goals of pharmacogenetics are maximize the drug efficacy, minimize the drug toxicity, predict the patient who will respond to intervention, aid in the new drug development. Pharmacogenetic have three main roles on the pharmaceutical industry. Which are studying the drug metabolism and pharmacological effects, Predicting genetically determined adverse reactions, Drug discovery and development and as an aid to planning clinical trials. Pharmacist plays the major role in applying pharmacogenetic discoveries to patient care. Pharmacist can take lead in application of pharmacogenetic in clinical practice, since they are expert in pharmacokinetic and pharmacodynamics. Pharmacist responsibilities are promoting the optimal use and pharmacogenetic test, interpreting the pharmacogenetic test, educating the pharmacist, fellow healthcare professionals, patients, and the public about the field of pharmacogenetic. Advantages of pharmacogenetic are to predict the patients responses to the specific drugs, to develop customized prescription, to improve the efficacy patients compliances, to improve

rational drug development, pharmacogenetic test should only conducted once in the life time, to screen and monitor certain diseases, to develop powerful vaccines. Pharmacogenetic is focused on patient variability and useful in patient disease specific healthcare. While pharmacogenomics focused on drug variability, predict drug efficacy and useful in drug discovery and drug development. Limitation of pharmacogenetics are : drug responses is affected by multiple genes, the drug responses is probably predicted from certain pattern of polymorphism rather than single polymorphism, holding sensitive information on someone's genetic makeup raises question of privacy and security. Pharmacogenetic plays important role in drug development and drug safety. Pharmacogenetic deals with the effect of multiple drug responses. Healthcare provider need to take pharmacogenetic into consideration while prescribing medication. Each patient's history, physical condition, gender must be consider with prescribing drug. Pharmacogenetic has great potential in drug therapy. Pharmacotherapeutics decision will soon become fundamental for diagnosing the illness and guiding the choice and dosage of medication. Pharmacogenetics is not a new subject area but its relevance to drug prescribing has become clearer in recent years due to developments in gene cloning and DNA genotyping and sequencing. Current pharmacogenetics knowledge can be considered on an individual gene, therapeutic area or individual drug basis. Variation in drug metabolism is one of the best studied areas in pharmacogenetics.

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CONFLICT OF INTEREST

The authors have declared that no competing interests exist.

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