Pharmacogenomic and Pharmacovigilance in Clinical Practice

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Abstract

The use of pharmocogenomic in drug development is effective in personalied medicinal therapy for patient. Pharmacovigilance become more effective in clinical practice due to understanding phenomenon of pharmocogenomic tools and its application of enzymes & metabolizer types etc. in effects of beneficial and adversity of drugs

KEYWORDS: Pharmacogenomic, Pharmacovigilance, Drug Metabolizer

1. INTRODUCTION

Pharmacogenomic & Pharmacovigilance both are interrelated in betterment of ADR protection in human being. Pharmacogenomic identify patient drugs and ADR affected in variant genes. Pharmacogenomic & Pharmacovigilance both deals in different individual drug response for ADR prevention by application of drug discovery drug therapy fer individual genetically based profile for disease management in legal and ethical basis in genetic medicinal protection.

There are certain disease in which ADR & Drug failure are common like oncology, cardio vascular, infections, mental disorders. The Pharmacogenomic & Pharmacovigilance are effective in altered nutrition, age, environment, ethnically and geographically, genetically variant genes.

Systemic work on ADR are cost effective in hospitalization during adverse drug reactions and therapeutic failure. During multiple drug therapy because of interactions and inter-individuality variation of physiological and patho-physiological for life style modification and drug affected to drug response, is complex procedure to understand.

2. METHODS:

DNA sequencing, gene mapping, bioinformatics allow to identify the genetic basis for drug efficacy, metabolism and transport in the genome is wide research for the responsible genes. Tissue transcript profiling is essential in cancer and human genome project will be covered for DNA micro arrays analysis and RNA analysis for bio-markers on drug induced toxicity will be estimated. Major pharmaceutical firms are responded for individual therapy like Pfizer, Novartis, Astra- Zeneca, Bayer etc.

3. DISCUSSION

There is individual variation in absorption, distribution, metabolism, excretion with individual enzymes, ions, receptors, channels and modification because of rapidity of individual metabolism and interaction with the receptors involvement.

The genetic polymorphism is assessed with normal population of different types:

1. Extensive Drug metabolizer, phenotypes.
2. Intermediate Drug metabolizer, phenotypes.
3. Poor Drug metabolizer, phenotypes
4. Ultra- Drug metabolizer, phenotypes

5-20 % of patient can belongs to one of above risk factor for therapeutic failure and drug concentration. 1% population have tendency to mutate in above sequences, So genetic code in polymorphism for mechanism as delete, insertion tandem repeats, mirco-arrays for point mutation or SNP for more than 90%. Some of altered problem unable to produce because of problems at expression level so the new development of genome and lab-card or genetic card for individual for genomic analysis are made.

Pharmecogenetics co-relates phenotypes drug analysis or drug toxicity with genetic variations and Pharmecogenetics DNA sequence with gene mapping for drug efficacy

There are pharmacodynamics genes as serotonin transporters or dopamine receptors are found but not in clinical practice but pharmacokinetics single genes are in practice as CYP2D6 & CPYP2C9 are in clinical practice.

Multiple genes for pharmacokinetics CYP2D6 & CPYP2C19 and these are dependent on drug metabolism enzymes and drug transporter. Polymorphism, pharmacodynamics drug metabolism interaction to the receptors ions, enzymes, channels are detected for CYP450 enzyme family.

4. CONCLUSION:

Clinicians only work upon the physical examination and therapeutic decisions facilitated by lab support and therapeutic drug monitoring tools for decision making in therapeutic failures and ADR's and Drug Resistance, now it has been altered by the pharmacogencmics in enhancing the support for decision making and quality controls and standardization upgrading the morbidity and mortality rates due to ADR will be systematically assessed by pharmocogentics testing.

5. RESULTS:

Pharmocogentics information require in therapeutic drug monitoring in future to standardize in the genetic variation makes safer in distribution of medication by pharmacist, environmental toxicology, forensic for targeted drugs by pharmaceutical company are now regulated and estimated for the, ADR's in individual predictions for personalized medicine and prevent death and serious fatal reaction.

6.FUTURE CHALLENGES AND RESEARCH

Considering regulatory evolution and approval of pharmacogenamics in clinical practice prior to treatment initiation to check the ADR's. and lower events of death and fatal reaction

7. REFERENCES:

1. Lazarou J, Pomeranz BH, Corey PN, Incidence of adverse drug reactions in hospitalized patients. JAMA 1998: 279:1200-1205
2. KOO SH, Lee EJ. Pharmacogenetics approach to therapeutics. Clinical and Experimental Pharmacology & Physiology 2006;33 (5-6): 525-32.
3. McLeod HL. Pharmocogenetic analysis of clinically relevant genetic polymorphisms. Clinical infectious Diseases 2005;41 Suppl;7:S449-52.
4. Davies SM. Pharmocogenetics, Pharmacogenomics and personalized medicine are we there yet? Hematology 2006;2006:111-7
5. Elizabeta topic Pharmacogenomics and personalized medicine university deparment of clinical chemistry school of medicine & school of pharmacy and biochemistry university of Zagreb, Zagreb, Croatia
6. Laviero mancinelli Maureen Cronin and wolfgang sadee pharmacogencmics the promise of personalized medicine AAPS pharmsci2000;2 (1) article 4 (http://www.aapsphatmsci.org/)