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Editorial

Pharmacogenomics-A Step Towards the Individualized Medicine

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Pharmacogenomics is relatively a young discipline of science which focuses on the impact of human genetic variations on drug response. The field of Pharmacogenomics is an amalgamation of the two science areas i.e. pharmacology and genomic with an aim at personalizing individual medicine. With clinical practice and drug development, individual drug response variation is faced as a major challenge in terms of drug safety and efficacy [1].

The concept that genetic changes may lead to variable drug response was brought forth in late 20th century. However, recently Pharmacogenomics is pacing beyond the scope of solitary gene making up to multiple genes, possibly causing varying drug response [2].

The variations in genetic constitution alters genetic polymorphism in receptors, transporters, enzymes involved in drug metabolism inducing both, variation and toxicity amongst individuals. Pharmacogenomics digs into such variations in patient's inheritance and offers specified therapy basing on strong scientific grounds [3].

Generally, medicines are prescribed to patients on basis of gender, age, liver and kidney functions. Pretty much of the prescriptions are written as evidence based choices on dose and drug yet might result in poor outcomes. Nevertheless, pre-treatment genomic testing and correlating the inheritance variations to the drug response allows modification with better treatment and minimal adverse drug reactions [4].

About twenty years ago, following completion of human genome venture it was expected that genome guided patient prescription will takeover. To an extent, it was seen with recognition of great number of major pharmacogenomic markers with their adoption in clinical practice and resultant optimized drug response [5].

Today Pharmacogenomics stand tall, not only in terms of improved safety and efficacy of treatment but also in cutting down the overall health cost. This counts in reduced hospitalizations, pin point pre-therapies and lesser side effects. Furthermore, a reduction is observed in drug development cost owing to prescreening of solitary nucleotide polymorphism [6].

In short, Pharmacogenomics field is one of the cutting edge techniques besides current factors hindering its execution in clinical set ups. Some barriers faced to it includes: non availability of data regarding association of inheritance especially of complex disease and drug response, relationship between the phenotype and genotype is not necessarily simple or straightforward. It is not always easy to establish link between drug response and gene variations to assess the cost effectiveness of the treatment, safety and efficacy, ethical and legal issues. In addition to this, it demands training of healthcare professionals plus large scale studies are required to evaluate the optimized drug response [7].

As we discover pros and cons of Pharmacogenomics which stands challenging yet seen with implementations across established medical centers. It is paramount for further progress to introduce dedicated leadership to the institution, add in considerable resources and efforts. It also demands funding and partnership with stakeholders i.e. medical centers and hospitals with engagement of healthcare staff including physicians, pharmacists, nurses and allied health care professionals. Moreover, an investment in training and education of engaged healthcare professional group will be a great support [8,9].

Looking into prevailing scenario and preceding discussion, it is suggested to introduce comprehensive studies in this field to fill the knowledge gap. It also presents a need of establishing standards pertaining publications that present a source of information for both researchers and clinicians. Also an ease in databases curation is required with development of the guidelines and their practicable integration in clinical practice [10].

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