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Pharmacogenomics in anticancer medication

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Pharmacogenomics is a relatively new field of study that combines pharmacology and genomics. The study is based on how genes affect the way a person responds to certain drugs. Pharmacogenomics has shown significant potential in cancer treatment as traditional therapies have been found to have low specificity, severe toxicity, high risk of side effects, unpredictable efficacy and vast differences in the therapeutic as well as toxic responses across patient populations. Cancer pharmacogenetics has been getting a lot of attention due to its ability to establish a cancer therapy that has minimum toxic side effects and provides maximum recovery. Pharmacogenomics allows us to elucidate the effect of genetic inheritance on individuals depending on how they respond to particular drugs and the toxic side effects they might encounter. There are many genetic factors, such as genetic polymorphism in drug metabolism enzymes, drug targets, drug transporters, etc. which greatly influence the differential responses and varying tolerability of cancer chemotherapy. Hence, pharmacogenomics has great potential to improve the results of cancer treatment by reducing the chances of drug failure and even increasing the efficacy of the drug, with its ultimate goal to find customised cancer chemotherapy or altered drug therapy that is most suitable for the individual based upon the genetic profiles of each individual. Using an individual’s gene profile, we can easily adjust the dosage requirement or choose an alternate drug that will be more suitable for treatment. It allows us to predict the toxic outcomes of certain drugs, thus allowing us to omit them. Due to vast advances in gene sequencing methods, we can now easily study the genome of an individual and personalise his/her cancer treatment to get highly effective results. This kind of therapy or treatment can also be called tailored therapy as it can be altered according to one’s benefit. Hence, the field of pharmacogenomics has the potential to revolutionise the medical sector and develop a more potent method for cancer treatment.

Keywords: Pharmacogenomics, Drugs, Cancer therapy, Genome, Tailored therapy

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