Implementation of pharmacogenomics in Clinical Practice

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Pharmacogenomics is the study of genetic variability affecting an individual’s response to a drug. Its use allows personalized medicine and reduction in ‘trial and error’ prescribing, leading to more efficacious, safer and cost-effective drug therapy. Technical developments have moved the field from reactive genotyping to a pre-emptive panel approach: in this latter approach, patients are tested for a panel of genetic variants even before drug prescribing has taken place. When these data are included in a patient’s electronic medical record, this allows physicians and pharmacists to use this information at the time of drug prescribing and medication surveillance.

Due to its highly developed infrastructure, The Netherlands healthcare system is at the forefront of implementing pharmacogenomics into routine clinical practice. Pre-emptive testing of f.e. DPYD before the use of 5-fluorouracil or capecitabine and of TPMT before the use of 6-mercaptopurine or azathioprine is standard in many centers in The Netherlands and patient’s drug dosages are personalized based upon the pharmacogenomics test result. In this presentation, an overview will be given of several pharmacogenomics implementation programs both in primary care and hospital care.

 Recently, an EU Horizon2020 project Ubiquitous Pharmacogenomics (U-PGx) was funded and investigates the approach of pre-emptive panel testing using a randomized clinical trial design in 7 EU countries and including a total of 8,100 patients. Feasibility, health outcome, especially the reduction of adverse drug events, and cost-effectiveness will be studied. The U-PGx consortium ultimately aims to formulate European strategies for further improving the implementation of pharmacogenomics.