
IS7. PHARMACOGENETICS ROLE IN FORENSIC TOXICOLOGY

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Accidental or deliberate deaths caused by chemicals are of always great interest throughout the human history. Forensic toxicology is one of the oldest branches in toxicological sciences and its main task is isolation, identification, quantification and interpretation of poisonings that cause injury or death. Multidisciplinary approach is the best rational solution in the investigation of a medico legal cause of death. Experienced professionals from toxicology, chemistry, biology, biochemistry, genetics forensic medicine and pathology are contributing to explanation of unexpected death especially in challenging cases.

Considerable number of people dies each year as a result of adverse drug reactions to prescription medications. Many factors have influence on medicine related deaths including patient characteristics (condition of liver and kidney, age, gender, weight, and number of comorbidities), drug administration (dosage, administration route, number of concomitant drugs), environmental factors and finally individual genetic make-up. Recent advances in understanding the human genome and the development of new technologies using DNA as an analytical sample together within toxicology field are of great interest for cause of death investigation in drug induced morbidity and mortality. Pharmacogenetics is the study of the influence of genetic variations on medicine response and development of adverse drug reactions. These genetic variations are indels, gene deletions, duplications, micro- and macrosatellites, and single nucleotide polymorphisms (SNPs). In human genome some of these differences cause altered protein, truncated protein or unstable protein in drug metabolising enzymes, drug transporters and receptors. Since pharmaceutical agents are one of the most commonly identified causes of adverse events, resulting in significant morbidity and mortality, the application of pharmacogenetics in forensic toxicology may provide a rational basis for the understanding of various drug associated fatalities.

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