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Relationship between cytochrome P450 polymorphisms and prescribed medication in elderly haemodialysis patients

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Background: Elderly patients on haemodialysis treatment have polypharmacy. The drug response can be influenced by age, smoking, as well as through the genetic variations in the cytochrome P450 (CYP) enzymes system. More than 80% of all prescribed drugs are metabolized by CYP enzymes. Aims of this study were to describe the prevalence of polymorphism in 3 CYP isoenzymes and the relationship between CYP polymorphism and prescribed drugs.

Methods: 51 elderly haemodialysis patients aged ≥65 years were included. CYP-genotyping was carried out in whole blood by a real-time PCR method for detecting common variant alleles in *CYP2C9*, *CYP2C19* and *CYP2D6*. The allele frequencies were calculated using the Hardy-Weinberg equation.

Results: The overall prevalence of CYP polymorphisms (heterozygous and homozygous) was 77%. The prevalence of heterozygous carriers of variant alleles coding for defective *CYP2D6*, *CYP2C9* and *CYP2C19* was 64%, 22% and 55%, respectively. The prevalence of homozygous carriers was 6% for each of the *CYP2D6*, *CYP2C9* and *CYP2C19* enzymes. The prevalence of *CYP2D6**6, *CYP2D6**9 and *CYP2D6**41 variant alleles did not differ from that in a European Caucasian reference population (p=0.31). 23 patients (45%) had at least one CYP mutation and used drugs that are metabolized by CYP isoenzymes. Metoprolol and proton-pump inhibitors were the most commonly used drugs that could be affected by a heterozygous or homozygous mutation.

Conclusions: Polymorphisms of *CYP2C9*, *CYP2C19* and *CYP2D6* are common in elderly haemodialysis patients. Many of these patients have a phenotype with altered CYP enzyme activity and could benefit from close drug monitoring.

Biography

Krystina Parker is a Specialist in Internal Medicine with ten years of experience. In the last five years, she has been a Consultant in the Nephrology department of Akershus University Hospital. She is currently working on her PhD at the University of Oslo which includes teaching medical students at various stages of their study. She is a Co-author in various projects including "Increased levels of inflammatory mediators and proinflammatory monocytes in patients with type I diabetes mellitus and nephrology" and "Glucarpidase (Carboxypeptidase G2) intervention in adult and elderly cancer patients with renal dysfunction and delayed methotrexate elimination after high-dose methotrexate therapy".

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