Pharmacogenetic testing as a tool in precision medicine for statin therapy

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AIM

The aim was to classify a cohort of cardiac patients on simvastatin according to SLCO1B1 genotype, SLCO1B1 function and risk of myopathy.

Methodology

Patients (N=110) on simvastatin were recruited by convenience sampling from the cardiac catheterisation suite at MDH. An EDTA-blood sample was collected from each patient after obtaining informed written consent. Genomic DNA was extracted and real-time PCR SLCO1B1 genotyping was performed using the Sacace® Biotechnology kits and Rotor-Gene™ 6000/Q for fluorescence detection. The patient cohort was classified into three genotypes; TT (homozygous wild-type, normal SLCO1B1 function), TC (heterozygous, intermediate SLCO1B1 function) or CC (homozygous variant, low SLCO1B1 function).

Results

The 110 patients (all Caucasian, 90 male, mean age 65 +1.02 years,) were genotyped as TT (78.2%, n=86), TC (20.0%, n=22) and CC (1.8%,n=2). Fifteen patients genotyped as TC or CC were on a higher simvastatin dose (40mg daily) than suggested by the 2014 Clinical Pharmacogenetics Implementation Consortium (CPIC) guideline for SLCO1B1 and simvastatin-induced myopathy (SIM).

Discussion

Patients genotyped TC (n=22) have mild risk of SIM, while patients genotyped CC (n=2) are at a higher risk of SIM compared to patients genotyped TT or TC. The guideline suggests decreasing the dose of simvastatin from 40mg to 20mg daily or switching to an alternative statin (rosuvastatin) in patients genotyped TC or CC.

Conclusion

The CPIC guideline suggests prescribing a lower simvastatin dose (20mg daily) or to considerprescribingrosuvastatin instead of simvastatin in TC and CC patients. This study serves as an example of pharmacogenetic testing to attain precision medicine.

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