

Estimating the prevalence of potential and actionable drug-gene interactions in Irish primary care: a cross-sectional study

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Abstract

Aims: Pharmacogenetics (PGx) is increasingly recognised as a strategy for medicines optimisation and prevention of adverse drug reactions. According to guidelines produced by the Clinical Pharmacogenetics Implementation Consortium (CPIC) and the Dutch Pharmacogenetic Working Group (DPWG), most medicines with drug-gene interactions (DGIs) are prescribed in primary care. This study aimed to estimate the prevalence of potential and actionable DGIs involving all medicines dispensed in Irish primary care. **Methods:** Dispensings of 46 drugs to General Medical Services (GMS) patients in the Health Service Executive Primary Care Reimbursement Service (HSE-PCRS) Irish pharmacy claims database from 01/01/21-31/12/21 were analysed to estimate the national prevalence of total dispensings and incidence of first time dispensings of drugs with potential DGIs according to the CPIC and/or DPWG guidelines. Phenotype frequency data from the UK Biobank and the CPIC were used to estimate the incidence of actionable DGIs. **Results:** One in five dispensings [12,443,637 of 62,754,498; (19.8%)] were medicines with potential DGIs; 1,878,255 of these dispensed for the first time. On application of phenotype frequencies and linked guideline based therapeutic recommendations, 2,349,055 potential DGIs i.e. (18.9%) required action, such as monitoring, guarding against maximum dose, drug or dose change. One in five [369,700 (19.7%)] first time dispensings required action, with 139,169 (7.4%) requiring a change in prescribing. Antidepressants, weak opioids and statins were most commonly identified as having actionable DGIs. **Conclusions:** There is a high prevalence of DGIs in primary care in the Irish setting, identifying the need and opportunity to optimise drug therapy through PGx testing.

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