LETTERS

# Letters to the Editor

## Pharmacogenomics and drug therapy

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I thank Andrew Somogyi and Elizabeth Phillips for their article on the role of pharmacogenomics in drug therapy.[1] However, I am surprised and concerned that their discussion is limited to recently identified genes and will mislead the casual reader about the importance of genetic testing in daily practice.

For example, glucose 6-phosphate dehydrogenase (G6PD) deficiency has been acknowledged as 'the most common enzyme deficiency in the world'.[2] Its role in acute drug-induced haemolytic anaemia has been known for over half a century.[3] Medicines including primaquine and rasburicase are definite triggers for drug-induced haemolytic anaemia in patients with G6PD deficiency, but other commonly used drugs can also possibly cause it, including some sulphur-containing antibiotics, quinolones, high doses of aspirin and paracetamol.

Genetic testing also enables early diagnosis of other haemoglobinopathies such as sickle cell anaemia and beta-thalassemia. Many patients with these are also sensitive to drug-induced haemolytic anaemia via oxidative stress from medicines similar to the list above.[4]

Testing for G6PD deficiency is rebateable on the Medicare Benefits Schedule, but genetic testing for haemoglobinopathies are often not. More importantly, most direct-to-consumer genetic testing kits would include these conditions for investigation. In our increasingly multicultural society, awareness of these genetic conditions is ever so relevant to those of Asian, Mediterranean and African ethnicities.

Many recent review articles continue to list G6PD deficiency as an important exemplar when discussing advances in pharmacogenomics.[2,3,5,6] I fear that its conspicuous absence in this *Australian Prescriber* article will only reinforce the mistaken triviality of this common condition in the psyche of prescribing doctors.

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### REFERENCES

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*Andrew Somogyi and Elizabeth Phillips, the authors of the article, comment*:

We thank Dr Goh for raising the relevance of G6PD deficiency and the indication for testing when prescribing primaquine and rasburicase. These drugs and others associated with haemolysis are invariably prescribed and monitored by specialists, and their use is infrequent. Indeed, for both drugs, G6PD deficiency has often been a contraindication in specific areas of the world where severe deficiency is common. As such, it is a subsidised test that should be performed before commencing treatment.

Like many of the genetically associated adverse drug reactions we draw attention to in our article, the prevalence of G6PD deficiency differs according to population and ethnicity, and is most prevalent in people of Mediterranean, African and Southeast Asian descent. This distribution of disease was likely driven by a protective effect of G6PD deficiency for falciparum malaria. In contrast to many of the adverse drug reactions that we discuss however, G6PD deficiency is inherited in a predicable X-linked recessive pattern – women are typically not affected as half of their red blood cells express the normal G6PD allele and are functionally normal – and infection or other illness precipitating oxidant injury rather than drugs is the most common precipitant of haemolysis.

Although haemolysis can be severe and prolong hospitalisation, it is easy to monitor through routine blood tests. It rapidly resolves either on discontinuation of the medicine or food, or resolution of the underlying acute illness, and is not a cause for significant ongoing morbidity or mortality.

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