Clinical effectiveness of psychotropic drugs: Pharmacokinetic and pharmacogenetic determinants

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As nowadays, the introduction of novel psychotropic drugs is a relatively rare event, the use of those presently available should be optimised in order to increase their efficiency. Ideally, medication should be personalized, in order to obtain a maximal efficacy and minimal risks for adverse effects. Knowledge about the neurobiological basis of the major psychoses and the biological consequences of pharmacological treatments has dramatically increased. This situation has prompted the development of tests in patients, to be carried out at baseline and during the treatment, in the aim to improve the diagnosis of the underlying disease, to select the optimal treatment and to monitor the clinical evolution of the patient. These tests are available both on the pharmacodynamic and on the pharmacokinetic level: (1) analysis of neurotransmitters (biogenic amines, neuropeptides, hormones) in blood or CSF; (2) pharmacogenetic tests at the pharmacodynamic (receptor proteins, neurotransmitter transporter proteins) and the pharmacokinetic (drug metabolising enzymes (e.g. cytochrome P-450), drug transporter proteins (e.g. P-glycoprotein)) levels; 3) monitoring techniques (drug receptor binding in the brain using imaging techniques, therapeutic drug monitoring in the blood, phenotyping for metabolising enzymes). There is much evidence about the usefulness of these techniques for diagnostic and monitoring purposes, but also about their limits in the clinical context and in their performance regarding sensitivity and specificity. In particular, there is a lack of studies, which combine pharmacodynamic and pharmacokinetic tests. The present state of research suggests that tests in relationship with the pharmacokinetic behaviour of a drug are useful tools to personalise drug treatment.

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