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Precision Medicine

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Precision medicine will become the newest hot topic in the research world. The director of the prestigious NIMH, Tom Insel, explained two weeks ago in his blog: "President Obama spoke about precision medicine in his State of the Union speech on January 20, his budget released today requests $215M for precision medicine, and NIH just announced plans for a study of a million or more volunteers to explore precision medicine. What precisely is it? The White House website has a useful definition: getting the right treatment at the right time to the right person".

What does it mean for psychiatry?

In the real life, significant inter-individual variability exists in psychotropic drugs response, therapeutic dosage, and adverse effects profile. Less than two thirds of patients respond to antidepressants, or to specific antipsychotics, but psychiatrists have learned with their personal skills to adapt the medical thesaurus to their patient population. However, prolonged times to response or remission represent a period of suffering associated with an increased risk for morbidity and mortality. Improving psychiatric treatments prescription, using a more biologically informed selection of psychopharmacologic agents through genotyping, has become a reality in clinical psychiatry. Routine genotyping has now become available to search for gene variations that code for proteins involved in neurotransmission and for enzymes involved in the metabolism of many pharmacological agents. Clinical validation and reliability of genotyping, access to testing, uniformity and clarity in test interpretation, and clinician and patient education are critical to this process of innovation diffusion.

How can precise medicine be applied to psychiatry?

Psychiatric classifications have remarkably evolved with time (DSMs, ICDs) so diagnosis is not the same constant as is the case in cardiovascular diseases, patients can fluctuate at different times between anxiety, depression and even bipolarity, and treatments can be adapted accordingly.

Yet, the classical aspects of precision medicine relating genotype to diagnosis and treatment, is particularly difficult in psychiatry. De Leon (2009) argued that there is no potential for pharmacogenetic testing to ascertain the best drug for each patient, and that pharmacogenetic tests will be restricted only to excluding some drugs from unusual patients and for using genes involved in drug metabolism for personalized dosing of drugs with narrow therapeutic windows (e.g. lithium where plasma level measurement is an essential part of treatment or clozapine where blood monitoring is essential). The field of personalized medicine was also criticized by Holmes et al. (2009) in a full review of 1,668 primary research articles. He concluded that the field was polluted by reviews and commentaries in a ratio of 25: 1 compared with primary articles.

First of all, it is necessary, because of the low penetrance of single genetic polymorphisms in psychiatric disorders and the certain importance of epigenetic changes, to use many different techniques in combination (electrophysiology, imaging, in association with pharmacogenetics), in order to better understand cerebral networks, before moving towards personalized medicine. The improvement of our knowledge of the causes of certain psychiatric disorders will lead to the identification of reliable biological markers (for review see Thibaut et al., 2015), which lack to date, and therefore, to personalized medicine.

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