Editorial

Adrián LLerena

Population pharmacogenetics and global health

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From pharmacogenomics to therapeutics: personalized therapy

There are great interindividual differences in the treatment of a given disease, which could be due to interindividual variability in response to the drug(s) used, and/or other xenobiotics (i.e., drug-food interactions) and/or endobiotic interactions. Besides well-known genetic factors that may strongly influence variability in drug response, other demographic and environmental factors such as gender, age, food intake, comorbid conditions, concomitant drug therapy, etc., have been also identified as factors affecting these differences.

Keeping in mind the importance of interindividual differences in treatment, the journal Drug Metabolism and Drug Interaction (DMDI) has been renamed Drug Metabolism and Personalized Therapy (DMPT). The new title reflects the extended scope of the journal that covers not only pharmacogenetics but also other factors affecting therapeutic response. DMPT aims to provide a forum for quality research focusing on the critical examination of any genetic and environmental factors influencing variability in treatment response to drugs, other xenobiotics (i.e., herbal medicine) and endobiotics.

This therapeutic variability can be manifested over time in a single individual (intraindividually), between individuals (interindividually) or between populations (interethnically). The existing pharmacogenetic knowledge of not only interindividual but also interethnic differences in drug response should be taken into account when a new drug is rolled out. Accordingly, DMPT has recently started with a series of articles each reviewing the interethnic differences in pharmacogenetics across countries and world [1].

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There is scientific evidence of the existence of interethnic differences in the response to certain drugs [2]. There appears to be patients who do not respond to standard pharmacological treatments designed for a given population or who present adverse drug reactions. Identical drug guidelines and dosage recommendations may not be appropriate for populations with different racial or ethnic backgrounds than those who participated in the clinical trials. As a result, population pharmacogenetic studies should be aimed at identifying both the patients in an ethnic group who do not respond to standardized pharmacological treatment and those patients who may be at risk of adverse drug reactions (i.e., percentage of poor or ultrarapid metabolizers). Results of these studies are integral to public health.

Although Western countries may be the first to benefit from any kind of genetically tested drug, it is crucial to improve knowledge of drug treatments for those who are considered minorities (e.g., autochthonous populations). The FDA and the EMA support studies on pharmacogenetics and ethnicity. First results of those studies have already initiated the FDA to develop specific drug treatments for Black minorities. Pharmacogenetic studies may help adapt therapeutic recommendations for each population group which are based on ethnic and cultural identities. Population pharmacogenetic studies could help in three ways: first, to optimize pharmacovigilance by identifying the percentage of individuals at risk of adverse drug reactions; second, to recommend therapeutic dosage regimens of specific drugs for specific populations; and third, to improve clinical trials by stratifying group populations based on ethnic and cultural identities.

DMPT population pharmacogenetics series

In order to promote the knowledge of population pharmacogenetics this journal has launched a series of articles evaluating geno- and/or phenotype frequencies of world-wide populations. Fourteen articles are published under a newly introduced section entitled “Reviews in Population Pharmacogenomics”. Thirteen articles have been published so far that focus on population studies, including an article from the RIBEF-CEIBA Consortium, which is a population pharmacogenetics initiative from...
the Iberian-Latinoamerican Pharmacogenetic Network RIBEF [3]. Additionally, population studies from several countries have been published within the DMPT population pharmacogenetics series, namely studies from Mexico [4, 5]; Eastern-Europe (Slavic populations) [6]; Lebanon [7]; Brazil [8]; Greece [9] United States (Jewish populations) [10]; Venezuela [11]; Central America [12] United States (US Hispanics) [13]; Italy [14]; Denmark, Faroe Islands and Greenland [15]; and the United Kingdom [16].

The results of these studies will improve the clinical use of available drugs and improve new drugs under development by promoting the importance of pharmacovigilance programs and recommended drug dosage regimens for specific populations affected by relevant global health diseases. Further, the results will produce the knowledge required for implementing pharmacogenetics and personalized medicine into relevant public and global health affairs.

In conclusion, the costs of the most relevant global diseases for individuals, families and society could be decreased by adapting drug recommendations to the characteristics of each population.

References


Prof. Adrián LLerena
CICAB Clinical Research Center,
Extremadura University Hospital and Medical School,
Badajoz, Spain, Phone: +34924218040,
E-mail: allerena@unex.es