Pharmacognosy-2013
International Conference and Exhibition on
Pharmacognosy, Phytochemistry & Natural Products
October 21-23, 2013 Radisson Blu Plaza Hotel, Hyderabad, India

Bioenhancers: Role in modifying Drug bioavailability, metabolism and targeting

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Abstract

In developing countries, the treatment cost is a major concern for modern medicine. So, there is need to reduce these costs. This article reviews the concept of bioenhancers to reduce treatment costs by increasing the drug bioavailability. This concept, based on the Ayurvedic system of medicine, works for a wide range of ingested substances, and has been applied to modern drugs, particularly single chemicals. It offers a fine example of the benefit of integrating an ancient system with modern medicine in both theory and practice. A bioenhancer is an agent capable of enhancing bioavailability and bioefficacy of a particular drug with which it is combined, without any typical pharmacological activity of its own at the dose used. Piperine has shown major benefits in combination with antitubercular, leprosy, antibiotics, NSAIDS, CVS and CNS drugs. Dose requirement of rifampicin is reduced by about half when piperine is used as a bioenhancer. Similarly, anti-cancer drugs like Taxol have been reported to show increased bioavailability with such substances. Bioenhancers act through several mechanisms of action. Different herbal bioenhancers may have same or different mechanisms of action. They may increase bioavailability of nutraceuticals by acting on gastrointestinal tract to enhance absorption, or by acting on drug metabolism process. Thermogenic and bioenergetic mechanisms are believed to be triggered by activation of thermoreceptors and release of catecholamines and/or direct action as beta 1, 2, 3-adrenoceptor agonist. Glycyrrhizin-mediated enhancement in the cell division inhibitory action of anticancer agent “Taxol” (paclitaxel) in the animal cell culture experiments has been reported underlining its role as bioenhancer. Other compounds like Carvone, Allicin and Zingiberine are also showing increased response in bioenhancement. The global focus is now on methods aimed at reducing drug dosage, and thus drug treatment cost. Bioenhancement may thus be explored as a potent method for the same.

Biography

Dr Sandeep Arora carries a professional experience spanning 20 years—3.5 years in pharma production and quality assurance, and 16.5 years in teaching/training and research—in the fields of pharmacognosy and natural products, regulatory affairs, industrial pharmacy, and management. He is the author of the book titled, **“Pharmaceuticals – Issues for Industrial Management”;** has been the **honorary editor of “Advanced Drug Review”—**a quarterly drug pharmacology review index—since 2005 and **Editor, Journal of Pharmaceutical Technology, Research and Management.**He has to his credit about 50 national and international research and review publications. His area of specialization and research are medicinal natural products (phytochemical, pharmacological evaluation and standardization), development and regulatory aspects of herbal and other products, and industrial management. He has guided 5 Ph.D. and 20 Master of Pharmacy thesis work and eight Ph D projects being underway.