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Developmental Strategies of Herbal Medicine in the Scientific World: Research Based Approaches

Mohammad Nazrul Islam*

Department of Unani Medicine, Hamdard University, Bangladesh

***Corresponding author:** Mohammad Nazrul Islam, Assistant Professor, Department of Unani Medicine, Hamdard University, Bangladesh, Sonargaon Narayanganj-1440, Bangladesh, Tel: 008801732780912; E-mail: dr_sayemnazrul@yahoo.com

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Abstract

Herbal medicine has been empirically used for treating the different curable and incurable diseases from ancient to till now. To study the pharmacodynamic and pharmacokinetic properties of the existing herbal formulations are very difficult task due to compound formulations. Now-a-days, raising the consumers claim about the safety and efficacy of prescribed herbal medicine by herbal medicine practitioners. I will try to amalgamate some prospective and retrospective views in the article. I would also like to conclude the article by a set of suggestions and research based strategic approach togeneralize the herbal medicine in the world.

Keywords: Pharmacodynamic; Pharmacokinetic; Prospective; Herbal medicine; Retrospective

Introduction

Herbal medicine has been used to cure the health ailments from the beginning of human civilization to till now. All forms of herbal medicine usually obtained from six major sources like plants, animals, mineral/earth, synthetic and semi synthetic, microbiological and recombinant DNA technology [1]. The quality of herbal medicine depends on the parts use for formulation like leaves, flowers, fruit, seeds, stems, wood, bark, roots, rhizomes or other plant parts or entire plants, fragmented or powdered, herbal materials, herbal preparations and their evidence based therapeutic efficacy [2]. By adopting macro to nano-technology and conduct extensive research on source of drugs, collection of drugs, preservation of drugs, sort out of drugs, storage of drugs, formulation development, titration of dosage forms, safety and efficacy profiles, side-effects, pharmaco-dynamic and pharmaco-kinetic actions, drug interactions, drug reactions, drug resistance, assessment of the safety of potentially hazardous substances in herbal medicines and the post marketing surveillance, the medicine will become a world famous systems in the upcoming world.

In the Field Based Strategies

It has been observed that raw materials used in the herbal medicine are collected in the wrong season, at wrong time and the wrong stage of their growth due to lack of knowledge of collector. That's why; the products made by adulterate raw materials are not given the expected result or outcome. By ensuring the process of raw materials identification, cultivation, collection and the preservation, the medicine will become a popular herbal medicine to the consumer. It is needed to follow standard operating procedure (SOPs) of current Good Manufacturing Practices (cGMP) for process, store or stock of raw or finished materials or products to achieve the desire goal of the products.

Manufacturing Unit Based Strategies

To follow the earlier assumption based pharmacopeia is a great problem of herbal medicine in the scientific era. It has been empirically proved that herbal formulations developed by following earlier pharmacopeias and revalidation with scientific techniques and technology are very difficult task. To ensure appropriate quantity of recipients and the revalidation of the formulation are very important factors to prepare the safe and effective herbal medicine. By adopting new technology and preparing patient centric novel herbal formulation, the medicine will become more popular among the consumers for their curable and incurable disorders. Dose titration is also playing an important role to declare a therapeutically effective drug. Proper dose for proper disease is very important factor to combat the disease. So, randomize clinical trials especially from second phase to fourth phase in the multicentre, multinationals, multicultural environment are vital approach to propagate the herbal medicine in the world.

Consumer Based Strategies

Most of the herbal medicines are traditionally formed. Experiment based animal studies are minute quantities. To know the safety profiles, indications, contraindications, drug-drug interactions, level for toxicity, efficacy and safety, identify the possible side-effects and minimizing procedure of side effects of herbal medicine are basic demand of consumers. Adverse drug reactions (ADRs) may follow by administering a single dose or at normal dosage and/or due to overdose or prolonged administration of a drug or result from the combination of two or more drugs. So, extensive clinical trials and huge data collections are utmost important for propelling the herbal medicine to the consumer. It is also needed to detect the biological activity form, secondary metabolites of the extract and establish of a bioassay system to permit identification of the active fractions.

Laboratory Based Strategies

Evaluation of pharmacokinetics (absorption, distribution, chemical changes of the substance in the body, the effects and routes of excretion

of the metabolites of the drug) and pharmacodynamics (biochemical and physiological effects of drugs on the body or on microorganisms or parasites within or on the body and the mechanisms of drug action and the relationship between drug concentration and effect) activities are very important for drug development. Typically, interactions were observed in drug-drug interaction, drug-food interactions and drug-plant interactions. These interactions may occur due to accidental misuse or lack of knowledge about the active ingredients involved in the relevant substances. By placing the proper skilled person in proper place, proper time and set up a biosafety level [3,4] standard containments and applying the sophisticated instruments for *in-vivo* and *in-vitro* studies are vital approach to achieve the desire goal of herbal medicine in the world.

Host Based Strategies

Drug resistance (DR) refers to reduce the effectiveness of a drug for curing a disease or condition due to failure of dosages or intolerance. Resistance may be intrinsic or acquired. Drug resistance develops naturally, but careless practices in drug supply and use are hastening it unnecessarily." Resistance to first-line drugs in most of the pathogens causing these diseases ranges from zero to almost 100% [5]. The four main mechanisms for DR are drug inactivation or modification, alteration of target site, alteration of metabolic pathway, reduced drug accumulation. Socioeconomic factors such as race and poverty affect the accessibility of and adherence to drug therapy [6]. Racial diversity, host-defense variability's and genetic shift and drift are non-modifiable inhibiting factors to claim the safety and efficacy of herbal medicine. So, multicentre, multicultural and multi-racial trials may help to overcome the problem to propagate the herbal medicine in the world.

Recommended Approaches Can Be Adopted to Develop Herbal Medicine in the World are as Followings

- Proper identification or selection, collection of the medicinal plants and extraction procedure of the identified plant with suitable solvent are mandatory to develop the herbal medicine in the world.
- Detection of biologically active compound, metabolites from the crude extract and establish of a bioassay system for identification of the active fractions are important approaches to claim the therapeutic efficacy.
- Isolation of the active compound by chromatographic or other suitable techniques and purification of the isolated compounds by repeated chromatography and crystallization.
- Establish the chemical structures of the pure compounds by various physico-chemical techniques and determine of their biological activity by various pharmacological and toxicological tests.
- To develop quality control methods for medicinal plant materials.
- To follow good agricultural and collection practices (GACP) for medicinal plants.
- To follow International pharmacopoeia (if needed).
- To follow good manufacturing practices, guidelines for methodologies on research, assessment and evaluation for pharmaceutical products and storage practices.
- To follow good trade and distribution practices (GTDP) for pharmaceutical materials.

References

1. http://howmed.net/pharmacology/sources-of-drugs/
2. WHO guidelines for assessing quality of herbal medicines with reference to contaminants and residues. Accessed on 05 Oct, 2016.
3. Ghani A (2003) Medicinal plants of bangladesh with chemical constituents (2ndedn.).
4. (2009) National Prescribing Service.
5. WHO Global Strategy for Containment of Antimicrobial Resistance (2010) World Health Organization. Accessed on 05 Oct, 2016.
6. Farmer PE, Nizeye B, Stulac S, Keshavjee S (2006) Structural Violence and Clinical Medicine. PLoS Med 3: e449.