



Review Article

A PARADIGM OF RESEARCH IN AYURVEDA: BARRIERS AND OPPORTUNITIES

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ABSTRACT

Globalization has created a better market for Ayurveda formally and informally influencing consumer behavior. To get succeed in the international market, research in Ayurveda must be conducted in areas like health care, education and Industry. This can be accomplished by the dynamic participation of the Governing bodies with PPP (Public Private Partnership) and III (Industry Institution Interaction). As we are in the area of globalization, issues like Innovation and quality plays a vital role. There are certain key areas we must focus on like literary research, meta-physical theories of Ayurveda for data collection. The areas under limelight like drug discovery, standardization of herb- mineral preparations, diet and lifestyle, probiotics, nutraceuticals and also awareness require herb-drug interaction. Findings indicate that policy makers focus on long term issues needed and to solve the challenge before them by creating the network for research and development. PPP,FDI model should be utilized in the proper way to encourage innovation and road map to have to be introduced for teamwork between the government bodies, academia, industries.

Keywords: Ayurveda, herb, research.

INTRODUCTION

The Healthcare sector in India is at an articulation point and is organized for rapid growth in the medium term. The Indian Healthcare sector currently represents a USD 40 Billion industry. Indian health care system mainly classified under two headlines, one is a contemporary system of medicine i.e. Modern allopathic system and the other one is an Indian traditional system of medicine like Ayurveda, Siddha, Yoga, Naturopathy or Unani, etc. and it is estimated that around 65-80% of Indian population depends upon the Indian traditional system of medicine. Since the last two decades, traditional medicines which are mainly prepared from plant sources are in great demand. India is an enchanting country with rich biodiversity and has over 45,000 plant species. About 1500 plants with medicinal use are mentioned in ancient texts and around 800 plants have been used in traditional medicine.¹

Ayurveda the science of life is one of the oldest medical civilizations that exist in India as well as in the world. We will get 1900 terms indicative of drugs but only about drugs 950 references are available in the Ayurvedic treatise (Bruhatrayi).²

According to the World Health Organization (WHO) report, herbal products will contribute about five trillion US dollars by the year 2050.³ But India's share in this area will not meet expectations even though we are in the era of Globalization, Privatization, and the fantastic achievement ITBT sector.⁴ The main issue of concern here is a lack of research in this field. The main problem of research is the lack of funding agencies, lack of proper identification and information of pharmacological principles and ecological variations plants influences to attain

uniformity in the formulation. Research to be carried out to evaluate the efficacy of various drugs mentioned in the various Ayurvedic sculptures.⁵⁻⁸

Major concentrations should be given to the Reverse pharmacological studies of extra pharmacopeial drugs as well as controversial drugs. It will revalidate the safety efficacy and therapeutic exploration of new drug and this will bring innovative changes in Ayurvedic Research by the involvement of Pharmacology, nanotechnology, chronopharmacology, pharmacogenomics etc⁹⁻¹² Scholars who are working in this area must focus on strengths, weaknesses, opportunities and threats in the following disciplines of research.

Literary research

Literary research plays a vital role in any discipline and it purely depends on the availability of Literature.¹³ The need of an hour is documentation of data, as scholars finding very difficult to gather the relevant data.¹⁴⁻¹⁷ Research data on Ayurveda is scattered and many times it is in vernacular language.¹⁸ It is very important to conduct literary research to solve controversial drugs. In this area, proper usage of Information technology plays a vital role, like proper usage of the digital helpline for Ayurveda Research Articles (DHARA) online resource, which has a repository of 54389 Ayurveda and allied science articles.¹⁹

The most important one is PubMed Database which has more than 3696 citations on the word Ayurveda as well as Ayurvedic Research.²⁰ Additionally, the Software's and Data collecting systems like Ayusoft, RUDRA, etc. also contribute in its way.

Meta-Physical Theories of Ayurveda

Every science has its own concepts. The Metaphysical theories are the fundamentals of Ayurveda. These concepts assist physicians to diagnose illnesses. Research on Ayurvedic concepts is required to evaluate both experimental and clinical data. The concept of the Ayurveda is derived from the theory of five basic entities (Panchamahabhutas), seven body tissues (Sapta Dhatu), Mind (Manas), Intellect (Buddhi) and Soul (Atma).

There is a rich explanation available on metaphysical theories of Ayurveda. While it is observed that, almost Ayurvedic research methods on metaphysical theories are qualitative and not quantitative.²¹ This is the right time to work on the basic principles of Ayurveda with sufficient scientific data.

Drug discovery

In drug discovery, we required a lot of strategic planning. It has been observed that in the world around 223 companies were engaged in screening active principles of the plants for medicinal usage.²² The study must be carried out on the feasibility of various dosage modality processing etc.^{23,24} Apart from this Scholars must concentrate on issues like palatability, precision in dosage, shelf life period etc.²⁵ without changing Ayurvedic pharmaceutical basic principles.²⁶

Research on controversial drugs

The controversy created the main drawback in Ayurvedic research especially in the area of identification and standardization of plant species. This can be solved by proper utilization of Ethnopharmacology and focusing on the pharmacodynamics and pharmacokinetics of a drug and its therapeutics. Countries like China, Korea invested largely in their traditional medical system and they are also keeping an eye on the smooth flow of funds for rejuvenation of their traditional medicinal system. An elaborate study should be conducted in this area to solve the controversy. In this regard, we must open to accept our failures and perform corrective measures.

Standardization of the products

Standardization of Ayurvedic dosage modalities always rises as a question by scientific folk. This is the right time to focus on quality to acquire global acceptance. Standardization and quality assurance both are two faces of the same coin. Standardization can be achieved at various levels like organoleptic evaluation, Physical evaluation, chemical evaluation, biological evaluation. By using contemporary tools like foreign organic matter, ash values, moisture content extractive values, chromatographic and toxicological studies all these help the standard of drug molecule to fulfill the minimum requirements for assessing the safety, efficacy and quality of herbal products according to WHO parameters.²⁷⁻³¹

Herbo-mineral Preparations

The medicines used in Ayurvedic therapeutics are originated from three sources viz. Herbal, Animal and Metals. The medicines prepared by using minerals, gems and precious stones and herbs are popularly known as Herbo-mineral (Rasa aushadhis) drugs. They are effective even in minute doses and found to be preventive, curative and promotive in health. The most common problems in using herbo-mineral drugs are nephro and hepato toxicities when they are used in impure state and without proper purification process mentioned in the classical texts. Research to be carried out to study the chemical change and

detoxification during the preparation of Bhasmas (Calcinated metals) by adding herbal essences.^{32,33} AYUSH must come with definite strategies with a Central institution like CSIR, IITR (Indian Institute of Toxicological Research) Lucknow, IIT's etc.³⁴

Probiotics and Ayurveda

India nurtures both the youth and the geriatric population. Aging is a process with progressive changes at the cellular level of the body. The free radical formation and oxidative stress play a major role in the body. The concept of Rasayana (Rejuvenation) is inimitable only in Ayurveda. This system of healing is considered to be probiotic in nature which is in complete contrast to the concept of antibiotics. As far as the Ayurveda is concerned, this is the core area of concern in the present era. Thus, the process of rejuvenation may be considered as that of free radicle scavengers and the concept of Rasayana can also be understood as immunomodulations.

Rejuvenation (Rasayana) drugs may enhance or influence memory, intelligence, arrests aging, stress and influences the metabolic process and thus can be used for both preventive and curative purpose.³⁵⁻³⁸

The most commonly used Rasayana drugs are Amalaki, (*Emblica officinalis*), pippali (*Piper longum*), Brahmi (*Bacopa monnieri*), Guduchi (*Tinospora cordifolia*), Triphala, Shilajit (*Bitumen*) Formulations like chyavanprash, Ashwagandha Lehya, Dhatri Rasayana, Brahma Rasayana etc.³⁹⁻⁴²

Diet and Lifestyle

In the present-day context diet and lifestyle is the main cause of many diseases. Ayurveda advocates the multidimensional concept of health, Ayurvedic treatise Sushruta Samhita clearly explains modes of disease transmission and principles of preventive medicine most simply E.g. Cancer.^{43,44}

Elaborate research is required to explore the efficacy of exercise, massage, meditation, breathing exercise, following daily and seasonal regimen, use of herbs in the diet such as ginger, turmeric, garlic, pepper, cloves, tulsi, saffron and taking seasonal detoxifiers and antioxidants such as Triphala, amla etc.⁴⁵⁻⁵⁰

Natural Supplements

The world market has a turnover of Nutraceuticals around USD 27 billion.⁵¹ Bolland and colleagues studied the role of calcium and its supplement that plays a vital role in osteoporosis but it has adverse action on the vascular system and this can be prevented by taking alternative measures by using dietary supplements like substances contain Phytoestrogens.⁵² Phytoestrogens source like Lignans which are generally present in the cell walls of the seed, fruits, vegetable grains, nuts and soya. Elaborate research is required in this area as the Ayurveda gives importance to dietary habits and food supplements.

Herb-drug interaction

Since the last two decades, there has been growing interest in the use of natural products particularly plant products.^{53,54} Many patients take herbal products in combination with prescribed drugs without their family physician's advice. The combined ingestion of herbs with prescribed drugs may raise potential herb-drug interactions.⁵⁵

The main cause for this is they are freely available, cost effective and a preoccupied and also free from side effect.⁵⁶ Recent

Medical literature has recorded on increase in herb-drug interactions.⁵⁷ Even though many studies are from case reports and limited clinical observations. For instance, an aspirin a non-steroidal anti-inflammatory drug possesses the potential to interact with herbal supplements such as garlic, turmeric, ginger, etc. and result in an antiplatelet activity. It is quite enigmatic to the present-day context of medical science. This can be studied as per modern pharmacodynamics as well as pharmacokinetics.⁵⁸ Here the areas should be concentrated on the Standardization of content of Natural products. A Collection of information (dose, route and time of administration, etc.) related to the co-administered drug.^{59,60}

DISCUSSION

A Minimum of 800 million US Dollars required for a new drug molecule to finish phase IV study. India is a great platform for science and technology for decades. Science has depended upon the systematic studies that make the research-based observation as an evidence-based one.

Ayurveda an old Indian traditional medicine is based on its principles and philosophy, but modern science is not an art, as it influences the manner of thinking. Research may be empirical, experimental as well as survey based. For the development of Ayurvedic medical science as evidence-based one likes other disciplines of science and to get global acceptance.

The Benefits of Research in Ayurveda should focus on

- Cost efficiency and higher quality patient care
- Proper utilization of the human resource
- Economies of measure and consumer satisfaction.

It is very necessary for the field of Ayurvedic research that both basic research and applied research should go hand in hand. The healthcare sector has attracted huge investment lately but the fund reserved in India for Ayurvedic research is very minimum for quality research outcome.

Usually, research that we conduct consumes a small portion of the total R and D budget. How we will bring change, it can be achieved by a commitment to purpose. The research in the Healthcare sector, in India, can be done by following modes

- PPP (Public-Private Partnership)
- Contract Research in India
- Foreign Direct Investment.

The projects are designed in such a fashion to harness science and technology, to solve problems or create opportunities. It is very important to mine various level data to raise quality research and execution should be done by careful quantitative analysis with the proper time frame.

A close and synergistic relationship between these basic and applied research is safeguarding, developing new scientific tools, it also influences to advance standards and approaches to assess safety, efficacy as well as quality. Research also helps to bring out better performance, services and training.

CONCLUSION

Herbal research is a long-lasting process; it is not a solitary step to complete the achievement. The junction of the abundant knowledge from the different traditional medical systems can lead to a new route in herbal research. So, the first and notable

step in the process of research is the knowledge of previous establishments and this works should be carried out at different places of Ayurvedic Institutes.

We also think over facts like privatization by giving autonomy to the institution.

The Prime Minister, Mr. Narendra Modi emphasizes focus on skill development and as an opportunity we have to introduce the interdisciplinary culture and cooperation like multicentric research, encouraging research by proper implementation of open-mindedness, creativity and creating opportunities.

The main drawback is the lack of infrastructure and the public sector is keen to continue to encourage private investment in this sector to tackle particular problems. PPP model is the best way to bind India's innovation competences and the government should take a step to promote PPP in innovative research projects.

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