



## RELEVANCE OF INTEGRATION OF AYURVEDA AND MODERN 4-P MEDICINE IN PREVENTION OF NON-COMMUNICABLE DISEASES

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### ABSTRACT

Statistics shows that the current measures for controlling non-communicable diseases are not adequate. This signifies the need of emergence of new concepts in health care system. In contrast to the infectious diseases, non-communicable diseases necessitate early diagnosis and personalized prevention. In tune with the new world trends Russian government approved the strategy of development of the technological platform "preventive environment". Platform is an integrated program of research in priority areas of health research, aimed at creating innovative products and technologies of personalized medicine. In the current scenario the concepts of modern 4-P medicine become more relevant. 4-P medicine is integrating with world's best schools of medicine to broaden its understanding of personalized approach. This article highlights the need of integration of 4-P medicine and Ayurveda. To a greater extent the concepts of Ayurveda-ancient Indian system of medicine corresponds ideologically with 4-P medicine. Therefore an integrated effort in this direction will be of great help in prevention and cure of non-communicable diseases. Integrated approach of 4-P medicine and Ayurveda can play a major role in the strategy development of 'preventive environment'.

**KEYWORDS:** personalized medicine, personalized prevention, Ayurveda, medical platform, preventive environment, healthy lifestyle, non-communicable diseases.

### INTRODUCTION

According to the WHO statistics<sup>[1]</sup>, 38 million deaths (63% of total deaths) due to non-communicable diseases (NCDs) occurred globally in 2014. The main causes of NCDs - cardiovascular, diabetes, lung disease and cancer - are considered to be unhealthy lifestyle and bad habits (alcohol, tobacco, unhealthy diet, physical inactivity). Half of died people were younger than 70 years. The epidemic of "lifestyle diseases" brings much greater threat to health than any other epidemic, known to mankind - Shanthi Mendis (the representative of WHO, the author of the report), noted. Worldwide, 42 million children under five years old are obese, and 84 % of teens do not get enough exercise. Unhealthy lifestyle is slowly progressive disaster for public health throughout the world. It is expected that by 2030 the total number of deaths from non-communicable diseases will reach 55 million per year, and the financial losses in the next two decades in the treatment of such patients in Europe will amount to more than 35 trillion euros<sup>[2]</sup>. Previous standard approach in treatment and rehabilitation of NCDs does not bring positive results. Therefore, reducing NCD morbidity by improving and implementing preventive methods as well as treatment and rehabilitation of these diseases is an urgent priority for public health policy of any country.

In the structure of global trends the concept of interdisciplinary approach to early diagnosis and personalized prevention of NCD in people of working age in order to maintain mental, physical health and longevity

becomes one of the long-term priorities of development of medical science<sup>[3,4]</sup>.

The prerequisites for the formation of a new concept of preventive and personalized medicine were the following factors:

- The emergence of the health industry, the development of health tourism, which has provided new opportunities for exploring traditional systems of Indian, Chinese and Tibetan medicines;
- The opening of a network of sports - recreational, SPA, Fitness - centers in residential and industrial complexes, hotels and increase their availability;
- The creation of new high-tech medical systems for early diagnosis and the risk of social diseases, to determine the biological age;
- Development of new medical technologies for personal assessment of the functional state in dynamics, for example, to control the exercise (personal pedometers, blood pressure monitors, heart rate monitors, and others.);
- The completion of the project on the human genome in 2003.

The studies revealed that most polygenic multifactorial diseases (comprise more than 85% disease), and environmental factors can influence gene expression. Several polymorphic variants of genes predispose to common multifactorial diseases, such as atherosclerosis, coronary heart disease (CHD), diabetes, osteoporosis, tumor and so on. These genes are called genes

"predisposition". Genetic research and the creation of individual "genetic passport" - DNA Data Bank of man and his family, containing an analysis of the chromosomes (karyotyping, as well as various genes), formed the basis for developing a set of preventive measures for a particular patient and made the conceptual basis of a new scientific and practical direction - prediction (predictive medicine).<sup>[5]</sup>

The generalized concept of the XXI century medicine was formulated by the American biologist Leroy Hood in 2008 as a "4 P» Medicine: Preventive, Predictive, Personalized and Participatory. Modern medicine has to be predictive (based on the molecular and genetic characteristics and genetic predisposition), preventive, personalized and, necessarily, "participative" - a conscious human beings, wellness programs, implementation of the recommendations. The direction of Personalized medicine is dynamically developing sphere in public health care system and medical science, that enables to predict individual predisposition before onset the disease, to provide targeted preventive measures and create personalized treatment algorithms tailored to the person. On realization of this purpose, European Personalized Medicine Association (EPMA) is promoting the advancement of multidisciplinary approach, dissemination of knowledge and involves a lot of different professionals and scientists into collaborative Projects.<sup>[4]</sup>

According to the Program "Horizon 2020", European perspectives and priorities in healthcare sciences are devoted to creation of the new concepts in preventive, predictive and personalized medicine with EU grant support<sup>[2]</sup>.

Entry into the post-genomic era means, that doctors and patients have to share responsibility for their health. Genetic testing as part of the diagnostic program, together with recommendations of the doctor has to change a man's attitude towards their health. Analysis of multifactorial diseases allows geneticists to conclude - whether a person belongs to the group of risk.<sup>[5]</sup> But polymorphisms may occur or may not occur. A person with genetic changes can't get sick, and without them can get the sick, because the role of genetic factors account about 20-25%, environmental factors are given 15-20%, the role of medicine is 8-10% and the role of lifestyle is 55% in the structure of health.

Therefore, we start to pay much more attention to such concepts as human health reserves, "norm corridor" - to internal conditions that allow to the genetic programs realize themselves in the best way and support mechanisms for self-regulation.<sup>[6,8]</sup>

Analysis of the scientific achievements and world trends allowed the Russian government approved the strategy of development of medical science in Russia for the period up to 2025 and to establish 14 scientific platform of medical science (its priority areas), the importance of which is the technological platform "preventive environment".

The purpose of the platform "preventive environment" is scientific support of the unified preventive environment formation as a complex of information, physical, social and economic factors, providing a healthy lifestyle (HLS) and the prevention of

chronic non-communicable diseases (NCD) for the reduction of mortality in the Russian Federation.

The tasks of the "platform" are:

1. The scientific foundation and providing of methodological support for the development and implementation of software mechanisms of formation of healthy lifestyle and prevention of NCD in different organizational models and population groups (primarily for children and adolescents);
2. The improvement of prevention of NCD is by developing methods for early diagnosis and effective correction of risk factors.

The scientific platform of medical science "Preventive environment" (hereinafter the "platform") is the most current, breakthrough, rapidly developing area. Platform is an integrated program of research in priority areas of health research, aimed at creating innovative products and technologies of personalized medicine (PM), which is realized by leading research teams and researchers.<sup>[3,6,7,8]</sup>

### Landmarks of the Platform development lay in two planes keys:

- Social Plan means the fight against common and complex multifactorial diseases;

- Economic Plan means the creation of scientific capacity and technology solutions major research problems that will be integrated into the international scientific space. Creating a platform should ensure that in the future the shift from "medical illness" to predictive and personalized as the most optimal in terms of quality of life, and economic burden of responding to requests of the labor market. Personalized medicine in many countries regarded as one of the priority areas, with obvious contribution to improving the quality and length of life.<sup>[3]</sup> For the interdisciplinary study of PM technology is necessary to study the experience of the world's best schools (especially schools of the East), where the culture of health is part of general culture, and advice on healthy lifestyles and disease prevention into account the individual characteristics of a person.

The medical system of Ayurveda - a holistic system of knowledge of ancient India contains the full range of diagnostic, preventive and therapeutic approaches and tools for the preservation of health and active longevity. This Indian doctrine of health and longevity is now popular in many countries around the world. If we make an analysis of the modern concept of 4-P of Medicine, Ayurvedic medicine is the most fully corresponds to it. Today, as never before, the basic principles of Ayurveda sound most actually.

### 1. Personalized approach of Ayurveda

Ancient sages of India adopted principle of generality (*Samanya*) and Specialty (*Visesha*) as the fundamental concept to structure then prevailed empirical medical practice into a medical science. Initially they observed the generality of elemental constituents of matter both in living being and non-living being. They observed the special characteristics of each element and named it as earth, water, fire, air and ether. Further they noticed that living being has special component called consciousness. Elements are perceivable by sensory

organs whereas consciousness is perceived only with consciousness itself. Hence existence of living being is perceived by a complex of sensory organs and consciousness. These functional-structural complexes due its varied permutations and combinations have umpteen numbers of special features. For the practical reasons they were generalized into 3 easily distinguishable *Doshas* (humours) viz, *Vata*, *Pitta* and *Kapha*. The proportion of *Doshas* at the time of the formation of zygote which is unchangeable throughout the life determines the *Prakriti* (constitution). Further structural development of the person maintains his own *Dosha* ratio of the constitution. When the structural and functional features of these *Doshas* corresponding within the range of these *Dosha prakriti* it is considered as state of health. A deviation from this normal range is considered as disease. Ayurveda has a deeper understanding of interrelations of *Vata*, *Pitta* and *kapha* with age, mental activity, metabolism, food, day, night, season, geography and functioning of the autonomic systems of adaptive, compensatory and pathological human reactions. Long before the decoding of the human genome Ayurvedic doctors used a constitutional approach to determine the health and disease. Because of Ayurveda assess the health of the person at par with the features of his *Prakriti* diseases also is assessed in interrelation with *Prakriti*. For example a slightly elevated temperature is normal for a *Pitta prakriti* person, whereas a in a *Kapha prakriti* person it is considered as fever. Similarly a *Kapha prakriti* person can express a high feverish condition with a mild temperature whereas a *Pitta prakrit* person can express a mild feverish condition with high temperature.

Mostly intrinsic diseases are psychosomatic in origin. The core reason for intrinsic diseases is considered as intellectual error (*Prajnaparadha*). Any act committed regardless of intellect, willpower and memory is considered as an intellectual error. For example, inability of a person to control smoking due to lack of 'willpower' to stop smoking can cause serious complication to himself. Memory is the recalled experience. Usage of an antibiotic that caused allergy before is an example for improper memory. Ignorance is an error of intellect. Non avoidance of etiological factors due to ignorance also is to be considered as intellectual error. Therefore a personalized approach is essential to identify the core etiology of the disease. Best mode of treatment is the avoidance of etiological factor. Ayurveda insist a personalized approach to identify the psychological reason for the diagnosis of a disease. [9,10]

Many researches are undergoing to investigate the correlation between Ayurvedic concept of *Prakriti* and individual human genotypes. A pioneering study showed significant correlation between HLA alleles and Ayurvedic *Prakriti* type. [11] Later, it was also hypothesized that different *Prakriti* may possess different drug metabolism rates associated with drug-metabolizing enzyme polymorphism. In another genotyping study, significant correlations between CYP2C19 genotypes and major classes of *Prakriti* types have been reported. [12] With respect to treatment Ayurveda often prescribes different procedures, medicines, formulations, diet, activities for same disease considering the constitution.

A double blind, randomised placebo controlled clinical trial that compared a personalized protocol of classic Ayurveda treatment for rheumatoid arthritis with an allopathic drug Methotrexate has reported. 43 patients were grouped as following treatment 3 groups: Methotrexate plus Ayurvedic placebo (n=14), Ayurveda plus Methotrexate placebo (n=12), or Ayurveda plus Methotrexate (n=17). The classic Ayurvedic treatment consisted of 46 formulations in multiple dosage forms like decoctions, medicated wines, pills, herbal powders, medicated oils and medicated jam. These formulations were customized for each patient and it was found that no two patients received the same prescription. In other words, the treatment was completely personalized. It was found that all three treatments were approximately equivalent in efficacy, within the limits of a pilot study. Adverse events were numerically fewer in the Ayurveda-only group. [13]

## 2. Preventive approach in Ayurveda

Prevention has prime importance in Ayurveda. The basic approach in prevention is to identify the root causes and its avoidance. As mentioned earlier the intellectual error (*Prajnaparadha*) is the core reason for disease. Ayurveda psychotherapeutic tools are effective in identifying the cardinal reasons of psychosomatic diseases. *Smriti* meditation technique is found to be effective in rectifying such cardinal causes and associated symptoms. [14]. Apart from intellectual error (*Prajnaparadha*) influence of time (diurnal and seasonal), contact of sense objects and improper actions have significant role in disease generations.

## 3. Predictive Medicine

Based on Ayurveda principle it is possible to predict the disease patterns considering the constitution, season, place of living, diet and activities.

It is also important to understand the phase of disease dynamics related to the various symptoms and observations. Due to wrong life style when the etiological factors are causing the increase of a particular *Dosha* initially it gets accumulated on its own seat (*Chaya*). Further accumulation causes aggravation (*Prakopa*) leads to spilling out from its place. If again *Dosha* increases it moves to other location (*Prasara*). Later as consequence of channel blockage *Dosha* stops and start accumulate there (*Stanamsraya*) and manifest as disease (*Vyakti*). As an impact of disease damage takes place in that location which is most often is irreversible (*Bheda*). Hence understanding the phase of disease is quite essential to predict the prognosis of disease.

## 4. Participatory medicine

Health and diseases are primarily a responsibility of the individual. Hence proper health is maintained only with proper awareness. Therefore the classical text of Ayurveda mentioned that the prime goal of the text is to give proper awareness to those who seeks the longevity and good health. The Sanskrit term for health is that *Swastha* means consciousness on its own place. Hence all effort to achieve health in Ayurveda is to bring back to the consciousness in its place so that the person will be totally aware of what is happening in and around. Active participation in expanding the awareness helps him to

correct the intellectual error. So the person can be free from diseases.<sup>[10]</sup> Ayurveda insist multidimensional awareness for prevention disease and maintenance of health. Detailed regimens of diet are proposed according to seasons, climatic changes, and diurnal variations. Apart from that certain codes of conduct, behavioral instructions and meditation practices are suggested for the expansion of mental and spiritual awareness.

### CONCLUSION

1. Changes taking place in health scenario necessitate a judicious integration of most effective health concepts of the world.
2. Emergence of 4-P medicine gives a wider platform for the integrations of various systems of medicine.
3. Philosophy of Ayurveda has a personalized and holistic perspective in the maintenance of health and treatment of diseases.
4. Ayurveda concept of *Prakriti*, etiology of diseases, disease pathogenesis useful in predicting the disease and determining the prognosis.
5. Awareness oriented approach ensures the participation of the individual in the process of prevention and cure.
6. Integrated approach of 4-P medicine and Ayurveda can play a major role in the strategy development of 'preventive environment'.

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