

REVIEW ARTICLE

Prevention and management of chronic Non-Communicable Diseases (NCD) with integrated Modern and Ayurvedic principles

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ABSTRACT

Lifestyle diseases are caused by unhealthy dietary and lifestyle behaviors. Currently worldwide NCDs is the major cause of morbidity and mortality. The incidence of lifestyle diseases like Hypertension, Diabetes Mellitus, Obesity and Cardiovascular Diseases is on the rise and drawing considerable attention.

Modern medicine is an evidence-based system with its efficient investigative tools, surgical procedures and continued research at molecular, genetic and pharmaceutical levels. Modern medicine has been developed extraordinarily with the fusion of technology in the field of diagnostic, prognostic, and curative procedures.

Ayurveda is a circuitous system of healing which is being practiced in India since time immemorial. This science still holds its significance in modern era in health promotion. Ayurveda usually has its two basic objectives; [i] to preserve the health of a healthy person, and [ii] to treat the disease of unhealthy person. However, there exists a wide gap between the principles of these two health care systems.

This review highlights the basic principles of modern medicine and Ayurvedic system of medicine to obtain holistic health.

Key Words: Modern medicine, Ayurveda, Integrated approach, life style diseases, NCD.

Concept of health and disease

According to the World Health Organization "*Health is a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity.*" Later this statement has been amplified to include the ability to lead a "socially and economically productive life"¹ with the establishment of WHO, for the first time the right to health was recognized internationally.

There have been many attempts to define disease. Some define it as "a condition in which body health is impaired, a departure from a state of health, an alteration of the human body negatively impacting the performance of vital functions". Disease is a state of discomfort in which the normal functioning of the body is affected.² Non-Communicable Diseases (NCDs) or lifestyle diseases are long duration (chronic) illnesses and are the result of a combination of genetic, physiological, environmental and behaviors factors. They are not transmissible by people, vector or contaminated objects.

Problem statement

Chronic non-communicable diseases are assuming increasing attention among the adult population in both developed and developing countries. The burden of chronic disease is showing an upward trend in most countries and for several reason this trend is likely to increase. Developing countries are now warned by experts to take appropriate steps to avoid the "epidemics" of non-communicable diseases likely to come with socio-economic and health developments coupled with effects of climate change.

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A total of 57 million deaths occurred worldwide during 2016. Of these, 41 million were due to NCDs, principally cardiovascular diseases, cancer and chronic respiratory diseases. Nearly three quarters of these deaths (28 million) occurred in low-and middle-income countries. The leading causes of NCD death in 2016 were: cardiovascular diseases (17.9 million deaths or 44 per cent of NCD deaths), cancers (9 million or 16 per cent of NCD deaths), respiratory disease, including asthma and chronic pulmonary disease (3.8 million or 9 per cent of NCD deaths), and diabetes (1.6 million or 4 per cent of NCD deaths)³. NCD hampers progress towards the 2030 Agenda for Sustainable Development, which includes a target of reducing premature deaths from NCDs by one-third by 2030. Poverty has been found to be closely linked with NCDs. The rapid rise in the prevalence of NCDs is predicted to adversely affect poverty reduction initiatives in low-income countries, particularly by increasing household costs associated with health care. Poor and vulnerable get sicker and die sooner than people of higher socioeconomic positions, especially because they are at greater risk of being exposed to harmful products, such as tobacco, alcohol, unhealthy dietary practices, and usually have limited access to health care services. In low-income groups, health-care costs for NCDs quickly drain household resources. Various studies across the world have shown the association between NCDs and accelerated decline of cognitive function leading to mild cognitive impairment.⁴ Yuvraj and colleagues in their study found that one in ten NCD patients had mild cognitive impairment.⁵

Causes and Risk factors

Lifestyle diseases are diseases which occur as a result of daily habits of people and an inappropriate relationship of people with their environment. Most epidemiologists accept that a set of "risk factors" are responsible for a major share of non-communicable disease morbidity and premature mortality. People of all age groups, regions and countries may be affected by NCDs but often associated with older age groups. Evidence shows that about 15 million of all deaths attributed to NCDs occur between the ages of 30 and 69 years. Among these "premature" deaths, about 85% are estimated to occur in low- and middle-income countries. A large percentage of NCDs are preventable through the changes in these factors. Four behavioral risk factors are responsible for significant proportions of these diseases - tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol. Major metabolic risk factors are obesity, raised blood pressure, raised blood glucose and raised total cholesterol levels.⁶ Tobacco alone accounts for over 7.2 million deaths every year (including from the effects of exposure to second-hand smoke), and is projected to increase markedly over the coming years. 4.1 million Annual deaths have been attributed to excess salt/sodium intake.⁷ More than half of the 3.3 million annual deaths attributable to alcohol use are from NCDs, including cancer. Around 1.6 million Deaths annually can be attributed to insufficient physical activity. The probability of dying between ages 30 and 70 years from four major NCDs is 23 per cent (27 per cent in men and 20 per cent in women), which means that a 30-year-old individual has a one-fourth chance of dying from these diseases before the age of 70 years.⁶

There are many gaps in our knowledge about the natural history of chronic diseases. These gaps cause difficulties in etiological investigations and research. These are:

1. Absence of a known agent
2. Multifactorial causation
3. Long latent period
4. Indefinite onset

One wing of prevention which is unfortunately lacking in modern medicine is primary prevention though it works well at secondary and tertiary prevention. Primary prevention can be very well achieved with the help of basic principles of Ayurveda.

Prevention and Management

Lifestyle diseases lead to reduction in productivity and development of the country as a whole. A WHO report shows that the world's poorest countries can gain US\$350 billion by 2030 by scaling up investments in preventing and treating chronic diseases, like heart disease and cancer, that cost an additional US\$1.27 per person annually. Appropriate and timely actions would save more than 8 million lives over the same period. It shows that for every US\$1 invested to address NCDs in low- and lower-middle-income countries (LLMICs), there will be a return to society of at least US\$7 in increased employment, productivity and longer life.⁸ Therefore, there is an increasing concern for their prevention. The preventive strategies of chronic diseases are based on the knowledge that they are multifactorial in causation, so their prevention demands a complex mix of interventions. Previously only tertiary prevention seemed possible to prevent or delay the development of further disability or the occurrence of premature death. But, now with the identification of risk factors, health promotion activities aimed at primary prevention are being increasingly applied in the control of chronic diseases.

The Global Coordination Mechanism on the Prevention and Control of Non-communicable Diseases, GCM/NCD, established in 2014, is the first and only WHO instrument aimed at facilitating multi-stakeholder engagement and cross-sectoral collaboration to prevent and control NCDs. The National Programme for Prevention and Control of Diabetes, Cardiovascular Diseases, Cancer and Stroke (NPCDCS) has been launched to tackle the situation effectively and India has committed to achieve the WHO global NCD targets by 2025 and the Sustainable Development Goals by 2030 through an integrated approach. The Global Action Plan provides member states with a road map and menu of policy options which when implemented collectively between 2013 and 2020, will contribute to progress on 9 global NCD targets including that of 25 per cent relative reduction in premature mortality from cardiovascular diseases, cancer, diabetes and chronic respiratory diseases by 2025. It will target four behavioral risk factors - tobacco use, diet, physical inactivity and harmful use of alcohol. The Sustainable Development Goals include a specific target for NCDs and several NCD - related targets. Target 3.4 calls for a one third reduction in premature mortality from NCDs by year 2030 and is an extension of the global NCD mortality target.

Ayurvedic concept of health, disease, and prevention of NCDs

Ayurveda is an ancient science of life with its root origin in *Atharva Veda*. In order to fulfill its two objectives of health promotion and treatment of disease *Ayurveda* has two important domains known as *Svastavrtta* and *Aturavrtta*. The first conduct deals with the promotion of health of a healthy individual and second one is for diseased person for cure of disease. A code of virtuous conduct has been mentioned which spared no aspect of an individual's life – his attitude to nature, relatives and friends; diet; work; physical and sexual activity; sleep; personal hygiene; clothes and adornments, and even such chores as haircuts and paring of nails. All these points actually add to the causative factors of life style disorders. Thus, by considering the mentioned elements dream of fit India can be achieved clearly. Also reduced incidences of Non-Communicable or lifestyle disorders can be evident by adopting the above lifestyle measures.

Mandagni (diminished digestive power) has been considered as main cause of diseases. Recent researches have shown that lifestyle modifications suppress down the occurrence of *Mandagni* related disorders.⁹ Besides these preventive measures *Ayurvedic* treatise are enriched with numerous curative medicines and procedures as well. Many researches are going in different fields of *Ayurveda* such as *Rasayana*, *Panchakarma* etc., for establishing their action in all fields of therapeutics. Effect of Ayurvedic medicines like *Amalaki*, *Guduchi* and *Mamajjaka* in Type 2 Diabetes mellitus has been well-documented¹⁰

From severe heart diseases to mild non-ulcer Dyspepsia can be managed by following Ayurvedic principles of living.¹¹ Hence, this health care system shares much with health promotion. Ayurvedic nutritional guidelines would also make sense within the healthy eating and focus of health promotion. It is the only known system of medicine across the world which believes the need of regular purification of the human biological system from gross level to the molecular level to render it suitable for self-recovery and therapeutic responsiveness. The different biological system of the body continuously undergoes wear and tear and needs to be repaired and rejuvenated regularly. To achieve this objective, *Ayurveda* advises *seasonal Panchakarma* as preventive/therapeutic measure for maintenance and promotion of physical as well as mental health. The key principle followed in the *Ayurveda* is *Swasthyashya Swasthya Rakshanam*, which means to maintain the health of the healthy, rather than *Aturashya Vikara Prashamanancha*, means to cure the diseases of the diseased.¹² For this purpose the *Dinacharya* (daily regimen) and *Ritucharya* (seasonal regimen) have been mentioned in the classics of *Ayurveda*.¹³ In contrast to modern curative medicine Ayurvedic theory focuses on the individual, not on group or community health. *Yoga*, which is already widely practiced pan India, is also in line with health promotion principles of self-care and self-knowledge of the body and mind. *Yoga* is a holistic science, which embraces physical, moral, social, mental and spiritual well-being. Most *yogasans* assist in maintaining vigor and rejuvenating the internal organs. Pranayama (breathing exercises) has assisted people with *vata* disorders such as bronchial ailments. *Dhyana* (meditation) an integral part of yoga has been shown to stabilize emotional imbalances, prevent the abnormal functioning of vital organs and restrain and control the nervous system. People with diabetes and epilepsy have greatly benefited from the practice of yoga.¹⁴ By changing dietary habits, many health ailments can be cured without using any medicine, while with several good medicines a number of diseases of the human organism cannot be cured if the food is wrong. Appropriate food is the key to good health.¹⁵

So, it is now evident that ancient techniques, therapeutics (*Rasayana*), *Panchakarma* and *Yoga* etc are being accepted to accomplish the following goals of treatment –

1. Strengthen immune system.
2. Efficient detoxification system.
3. Responsive inflammatory system.
4. Optimal metabolic system.
5. Balanced regulatory system.
6. Enhanced regenerative system.
7. Harmonize the life force.
8. Free radical scavenging or anti-oxidant

Need of Holistic health approach

Already designated as diabetes capital of the world, India now appears approaching towards gaining another dubious distinction of becoming the lifestyle related disease capital as well. A study conducted jointly by the All India Institute of Medical Sciences and Max Hospital shows that the incidence of hypertension, obesity, and heart disease is increasing at an alarming rate, especially among young, urban population.¹⁶ Modern medicine with its continued on-going research programmes has led to remarkable achievements in understanding various disease processes, their causative agents and developing newer therapeutic measures and technologies to deal with them. It has successfully controlled the prevalence of infectious diseases and significantly improved the quality of life of patients with chronic medical conditions. So, we cannot design of holistic health approach without the help of modern medicine.¹⁷ But the newly emerging diseases and health problems are still outnumbering the therapeutic efforts. Challenges like Diabetes, Hypertension, AIDS, different malignancies, infertility etc. are still a constant cause of worry. In spite of the billions of dollars spent on cancer research and the availability of the best health care in the world, cancer is one of the leading

causes of death in the US and around the world. Lifestyle has been named as one of the major contributors to the incidence of cancer.

Ayurveda, the world's oldest recorded system of health care is widely used in India as a system of primary health care, and interest in it is growing worldwide as well.¹⁸ we are now in an era of modern epidemic in the form of chronic non-communicable diseases though we have conquered communicable diseases largely. *Ayurveda* with its age-old principles is undoubtedly a boon to redress these problems. With the recent development of the National Rural Health Mission, some of the principles and remedies are being used very effectively to combat the public health problems.

Although modern science has made remarkable success in understanding cancer and its molecular basis, the knowledge about how to prevent or treat cancer completely is still lagging behind. Though the biology of cancer is much better understood today still, the search continues for an ideal treatment that has minimal side effects and is cost-effective. Diabetes and hypertension have emerged like an epidemic over last few decades. These are perceived lifestyle disorders and believed that once you get them you have to live with them. To overcome this scenario many such patients prefer alternative forms of therapies like *Ayurveda*. A time has come to fill the gap between these two healthcare systems and for that matter we must try to understand the fundamentals behind *Ayurvedic* system of practice. It is designed to promote good health and longevity rather than to fight disease and was practiced by physicians and surgeons. It is estimated that about 80% of Indian population use *Ayurveda* medicines for their healthcare needs.¹⁷ Also, use of *Ayurveda* in the Western countries is increasing.¹⁹ So instead of just debating which healthcare system is better, a time has come to follow an integrative approach for the betterment of our patients. With the resurgence of SARS Corona virus in the form of COVID-19, nature has once again startled humanity as it does at frequent intervals with its enormous power and unpredictiveness. When this paper was being written, there was no cure of COVID-19. We have to rely only on preventive measures and boosting of overall immunity of our body.

Thus, on one hand we have modern system of medicine with all the glamour as well as attention from higher authorities but lacking holistic approach and on the other hand our thousands of years old traditional healthcare system having holistic approach but seems to be in a pathetic condition due to various factors. Doctors however, advice a strict balanced diet, regular exercise along with cholesterol controlling drugs can go a long way in checking lifestyle diseases. Applying the knowledge of *Ritucharya* we can surely avoid these by practicing regimen in accordance with the *Ritu* to maintain the harmony of the *Tridosha* and to stay healthy ever. Increasing public awareness, improving attitudes with the support of the government and corporate wellness programs may help arrest the rapid increase in the incidence of such diseases, saving lives and crores of rupees in costs. Government of India felt the importance and established Ministry of Ayush in 2014 to ensure the development and propagation of AYUSH systems of medicine. The curriculum should be designed in such a way that it will incorporate the key concepts and treatment modalities of traditional system into modern medicine. Banaras Hindu University (BHU) has tried such integration in early 20th century. Due to lack of Gov. support the process has remained slow and unorganized in past but this is not the scenario now. Govt of India is giving due importance by Enhancing AYUSH in its different health policies. If *Ayurveda* and modern medical world works hand in hand, many problems of health care can be solved and expenditure can be reduced to a large extent. In July 2020, Govt of India stating that healthcare education in the country needs to be re-envisioned, the new National Education Policy 2020 (NEP 2020) that has been approved by the cabinet calls for a healthcare education system that must be integrative. Specifying on the word "integrative", the vision document that was recently released by the HRD ministry states that all students of allopathic medical education must have a basic understanding of *Ayurveda*, Yoga and Naturopathy, Unani, Siddha, and Homeopathy (AYUSH), and vice versa. The document besides this, stresses on greater knowledge and skills on primary as well as preventive healthcare for students.

Conclusion

Ayurvedic health care concentrates on the health and well-being of the individual as a whole, and as a member of society, which is exactly in line with the principles of community medicine reflecting primordial prevention. Following a healthy regimen is undoubtedly one of the keys for good health. The way of living should be managed despite a hectic routine to lead a healthy life. Apart from conventional drug approach, non-pharmacological aspects of prevention of disease should also be included in managing a patient. GOVT. bodies, AYUSH and NMC (National Medical Commission) to follow an integrative approach, which will be based upon needs assessment, need aggressive efforts. Moreover, extensive collaborative research using multi-specialty network is also the need of time to integrate more effectively for the betterment of humanity.

Modern medicine with its advanced technology and ancient Ayurveda with its age-old techniques if go hand in hand then the day is no longer when India will become a global leader in complete health solutions. We feel that the time has come to build the bridges between these two healthcare systems to achieve the goal of complete health to all and lead globally in healthcare. This is also reflected during the COVID-19 pandemic in 2020, when government of India released various advisories concerning the principles of Ayurveda to address the problem and its management more effectively.

Author's contributions: IAK and KB: reviewed different journals and online search engine and wrote the manuscript relating modern medicine. (ikhan0046@gmail.com)

HSJ: reviewed the entire manuscript and done needful amendments.

PS: reviewed different journals and online search engine and wrote the manuscript relating Ayurvedic concepts.

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