



Concept Of ‘One Health’ A Modern Approach With Respect To Ayurveda.

Ganesh S. Hedaoo, Omprakash R. Gulhane

Assistant professor

B.M.A.M. Nandanwan, Nagpur.

Abstract

Ayurveda plays a key role in ‘one health care’ system concept. The ‘One Health Concept’ directly addressed human beings, animals and plants are mutually supporting each other and play major role in balance of ecosystem, if one of the above three gets vitiated that affect each other health. Although vector-borne diseases, zoonotic diseases, antimicrobial resistance (AMR) and biomedical, industrial, agriculture, radioactive and e-waste are the major factors which directly or indirectly affects the integrity of ecosystem. Being most developed creature on earth human has the capability to utilize their traditional knowledge to protect ecosystem by considering health of all creatures on earth and balancing ecosystem through one health concept.

Keywords: One health, antimicrobial resistance, Ecosystem, Ayurveda.

Introduction

‘One World, One Health’ concept recognized, acknowledged and adopted by the scientific community and policymakers as One Health. It is an integrated, approach that aims to sustainably balance and optimize the health of human, animals and ecosystems. It imparts the health of humans, domestic and wild animals, plants, are closely linked and interdependent^[1] The approach mobilizes multiple sectors, disciplines and communities at varying levels of society to work together to tackle threats to health and ecosystems along with the collective need for clean water, energy and air, safe and nutritious food considering on climate change and therefore help to take actions to prevent environment resulting and contributing sustainable development. Recently, One Health project is being contribution of Quadripartite Food and Agriculture Organization (FAO), The United Nations Environment Programme (UNEP), The World Health Organization (WHO), and the World Organisation for Animal Health (WOAH or OIE).^[2] However, One Health applies to different issues like antimicrobial resistance (AMR), which happens when germs like bacteria and parasites develop the ability to defeat the drugs designed to kill them and continue growing and spreading; similarly zoonotic disease spread between animals and people for example Ebola, avian influenza, rabies, etc. Vector-borne diseases which affect people who get bitten by a vector mosquitoes, ticks, lice and fleas and cause dengue fever, malaria, Lyme disease; food borne diseases caused by consuming contaminated food for example norovirus, salmonella, listeria, etc Environment, water pollution, air pollution and climate change affect one health concept. In this way, Human beings, animals and plants are coexisting in same environment they are interdependent therefore their health is also interdependent^[3] One Health approach can be achieved by professionals and expertise who are actively working in different sectors like public health, animal health and the environment. they effectively recognise and take actions in early stages of outbreaks of zoonoses; therefore, regularly epidemiological data and laboratory information should be shared across sectors. Government officials, researchers across local, regional, national and global level should implement joint responses to health threats. In India there are various disciplinary working to promote one health however will have reunited to achieve desirable result.^[4] Recently, Health sectors, Veterinary sectors, environment sectors are working separately with weak coordination. Educational institutes like School, colleges and university should educate one health concept in curriculum to awareness amongst student.^[5]

Aim

- To utilize the ancient knowledge of *Ayurved* to fortify basics of one health that is to develop conventional to contemporary available facilities through ayurveda.
- To achieving health through *Ayurved* medicine to overall pandemic preparedness and integrated disease control against priority diseases of human, animal and plant sectors.
- To develop early warning systems built on integrated surveillance system and response readiness using conventional ancient knowledge for endemic as well as taking actions against emerging epidemic or pandemic threat.

Concept of one health

At present public health issues have evolved into complex and difficult to handle in the world focusing on human health alone. As seen in the last few decades, emerging new infectious diseases were first observed in animals and then spilt into humans. Examples include HIV, Ebola, Nipah, Hendra, Highly Pathogenic Avian influenza H5N1, Severe acute respiratory syndrome (SARS), Middle East Respiratory Syndrome (MERS), and the current COVID -19 pandemic. In this sector All Government organisation being supreme policy maker is preparing to achieve goals. Office of the principle scientific advisor to GOI launched National one health mission in year 2022 with the aims to coordinate across achieving overall pandemic preparedness and integrated disease control against priority diseases of human, animal and environmental sectors with early warning systems built on integrated surveillance system and to develop response readiness for endemic as well as emerging epidemic or pandemic threat. Because collaboration of various disciplines is the demand of hour to integrated health and disease related surveillance in vulnerable species. Various disciplinary collaboration are as follows.

1.0 Indian council for agriculture research (ICAR)^[6]

2.0 National disaster management authority (NDMA) works collaboration focuses on developing action plans for disaster management, including climate change-related events, and addresses the prevention and control of zoonotic diseases through the National One Health Programme.

3.0 National centre for disease control (NCDC) One Health implements four National Health Programs, these are

3.1 National Rabies Control Program (NRCP) with the Objective is to prevent and control deaths due to Rabies in Humans and progressively achieving the Global target for “Rabies- Zero by 2030” Impact of animal disease in human health sixty percent of existing human infectious disease are zoonotic disease like rabies that affects the nervous system of mammals. It is caused by a virus and is typically spread by an infected animal biting another animal or person.

3.2 National One Health Programme for Prevention and Control of Zoonoses (NOHP-PCZ)

3.3 Program for Prevention and Control of Leptospirosis (PPCL)

3.4 National Programme for Prevention and Control of Snakebite Envenoming (NPSE)

3.5 Surveillance and to keep Watch for causative factor related to threatening condition.

4.0 Ministry of health and family welfare (MOHFW) Implementing integrated disease surveillance within and across human, animal, and environmental sectors to address communicable diseases of zoonotic, transboundary animal diseases and diseases of epidemic/pandemic potential.

5.0 Ministry of environment forest and climate change (MOEF&CC) Deforestation and animal habitat destruction leads to biodiversity loss and movement of animals to human habitat, thus increasing the incidence of zoonotic diseases. Wild animals are considered reservoirs of many serious zoonotic infections. Destruction of forests results in increased interaction between humans and animals, hence the spread of pathogens. Ecological changes increase migratory birds' untimely and frequent movement, responsible for transmitting highly pathogenic avian influenza (HPAI) and many other viral diseases. Inter-species jump of Ebola virus from wild animals to humans because of ecological changes. Following other viral diseases originating from non-human species jumped to humans due to ecological change. Ecological factors play an essential role in transmitting vector-borne disease (VBD). Climate change and global warming will drastically affect the geographical distribution of several vectors responsible for transmitting the diseases, e.g., Bluetongue, dengue, malaria, RVF, etc. Temperature, humidity, and rainfall influence vector populations' breeding, distribution, and density. This is why most of India's endemic parasitic, protozoan, and viral diseases are related to the monsoon. Change in temperature and humidity favours the intermediate host of vectors and free-living stage of vectors. Temperature and soil moisture affect the spore germination of anthrax and clostridium. Further, heavy rainfall stirs up dormant spores of these organisms, in this way this department conduct active and passive surveillance programs in forest.

6.0 Indian council of medical research (ICMR) has started the preparatory activities for establishment of a dedicated infrastructure in the form of National Institute of One Health (NIO) at Nagpur which will also house a BSL-IV laboratory. The institute will work with the combined holistic method of the One Health approach under the supervision of experts from different sectors like animal health (veterinarians), environmental health (ecologists, wildlife experts etc), and human health (epidemiologists, public health experts etc) and amalgamation of various bodies like WHO, various health organizations and national governments for successful application of One Health. It also developed national guideline for antimicrobial stewardship programs (AMSP) and trains clinicians to ensure antibiotics are used wisely in healthcare.^[7]

7.0 Office of the principle scientific advisor to GOI

8.0 Department of animal husbandry and dairying (DAHD) Support in animal rabies surveillance, isolation and observation of affected animals and implement mass animal vaccination against it.

9.0 Department of Pharmacy (DOP) Pharmaceutical Development and Research develop new drugs and vaccines for both human and animal health, addressing zoonotic diseases and emerging infections.

10.0 Department of Biotechnology (DBT) It is an approach to design and implement programmes, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes.

11.0 Department of science and technology (DST) Supporting Research and Development by funds research projects that contribute to a better understanding of zoonotic diseases, antimicrobial resistance, and pandemic preparedness. It encourages collaboration between various stakeholders, including human and animal health sectors, to develop integrated strategies for disease prevention and control. It provides funding and support for training programs that provide scientists and researchers skills needed to address One Health challenges by dissemination of IEC, development of diagnostics and therapeutics for disease prevention and intended to develop disease resistant plant species.

12.0 Council of scientific and industrial research (CSIR) is actively involved in One Health initiatives, particularly through the "Phenome India-CSIR Health Cohort Knowledgebase (PI-CHeCK)" project, aiming to understand India-specific risk factors for cardio-metabolic diseases. This project involves collecting comprehensive data from across India to develop more accurate risk prediction algorithms for the Indian population. Additionally, CSIR supports human resource development in various biotechnology areas, including environmental biotechnology, to address environmental challenges and build capacity for one health initiatives.

13.0 Defence research and development organisation (DRDO). It has a dedicated Life Sciences cluster that may engage in research related to biological weapons, counter measures, and biomedical engineering. The DRDO's research in biotechnology and diagnostics could contribute to the development of tools for disease detection and prevention in humans and animals.

14.0 Ministry of AYUSH. This system often use natural remedies, such as herbs and minerals, which can have fewer side effects and are more accessible and affordable for people in underserved or resource-poor communities. This can be especially important in addressing the health needs of rural or remote populations, where access to modern health care is limited. The most of antimicrobial drugs gradually losing their efficacies due to their injudicious and non-therapeutic without thinking uses in human and animal health. Because of this personalized concept in ayurveda can play a major role in treatment selection according to body personal constitution various diseases. Ayurveda focus on disease prevention by adapting daily and seasonal regimens using natural herbs and drugs, as well as therapeutic interventions for disease. Ayurveda describe four factors which could be responsible for epidemics these are vitiated air, water, region, and time. Any abnormal alteration in these four factors can significantly influence human, animal or community or environment when these factors become disrupted or contaminated, it can result in the development of illnesses and, ultimately mortality. This condition is referred to as "Janapadodhwans.[8] ayurveda also focus on Dinacharya (daily regimen), Ritucharya (seasonal routine) and Sadvritta (code of Good Conduct for Mental Health and Social Behaviour) are important rules and regulations for prevention of diseases and leading an ideal positive health. These rules are highly effective in reducing the lifestyle disorders. Ayurveda stalwarts like Acharya Charaka prescribed the list of good conduct and behaviour under heading of Sadvritta. It gives us detail knowledge about how to live, dos and don'ts for the person. One who follows the code of good conduct for the maintenance of positive health lives for a hundred years without any abnormality. Recommendation is made to explore the Sadvritta as positive approach towards healthy life in present scenario^[9]

14.1 One health concept for animals (*Pashu Ayurveda*)

Acharya Palakapya was ancient hermit write manuscript on Hasty ayurveda of Nakula Samhita described various treatment modalities in horse (Asvayurveda), cow (Gavayurveda) elephants (Hasty ayurveda), Margi-Ayurveda (animals) etc are the various Ayurvedic literature during ancient eras which describe treatment, many communities in India still using medicinal plants for ailments of cattle. Research evidence suggests the effectiveness of herbal formulations in preventing and managing diseases such as bovine mastitis, foot and mouth disease (FMD), diarrhoea, udder pox, repeat breeding, bloat, indigestion, and maggot wound, and reduction in the use of antibiotics.^[10]

14.2 One health concept for plants (*Vrikshayurveda*)

The science of plant life is also called as Vrikshayurveda mainly focusses not only on curing plant diseases and protecting plants from insects and fungi, but also to keep them healthy in a sustainable way. Ayurveda's fundamental goal is to preserve or restore the right balance of the three doshas(defects): Vata, where the air and space components predominate; Pitta, where the fire element predominates; and Kapha where the earth and water elements dominate. "vata" disorder may include dryness, wilting, or stunted growth, while symptoms for "pitta" disorder may include yellowing leaves, burning sensation. Although the use of chemical fertilizers results in visibly more robust plants, their negative impact on nutritional quality of plants as well as the environment is becoming evident with time. The ancient traditional methods used by our farmers, unlike chemical dependent techniques, certainly have no adverse effect on the environment as they are prepared from naturally available raw materials which are biodegradable. Their use in the present times has been minimal due to lack of modern scientific evidence of their efficiency and activity. incorporation of suitable traditional techniques during development of, along with currently available practices, Western countries are preferring organic farming. Kunapajala, the fermented liquid manure used in ancient India, showed practicing Kunapajala can provide soil health management as well as plant protection against pest and diseases, which finally reflects an increase in agricultural productivity. It is a fantastic invention. Agronomists all over the world currently are inclined to traditional, conservative, and organic farming methods.^[11] The philosophy of Vrikshayurveda has traditionally emphasized prevention over cure, and it also makes several recommendations for maintaining biodiversity. The ancient Ayurvedic literature contains numerous recipes for organic pesticides and manures and organic fumigation herbs, and modern agricultural experts and research facilities are using these recipes with great success.^[12] In this way Vriksha Ayurveda source of supply of nutrients (ahara) and medicines (aushadhi). Plants form the major source of medicines meeting most of health India is very rich with respect to the ethnic and native knowledge regarding the Science of farming which includes Agriculture, Horticulture and conservation of the medicinal plants, Vriksh ayurveda can also play an important role in the field of intercropping and put forward for the use of organic fertilizers and can play a crucial role to build the eco-friendly environment.^[13]

14.3 One health concept for nature in Ayurveda

Ayurveda offers a holistic approach to one's health, focusing on balancing *tridosha* and harmony between mind, body, spirit. By emphasizing personalized wellness through natural remedies, dietary choices, and lifestyle adjustments, Ayurveda promotes overall well-being and longevity. Its principles can complement with modern medicine, contributing to a more comprehensive, convenient, feasible and sustainable approach to health. Ayush systems can also play a role in addressing issues related to environmental and animal health. Ayush systems often emphasize the importance of living in harmony with nature, which can help to promote environmentally responsible behaviours. *Vrikshayurveda* and *Pashuayurveda* are also relevant in this context.^[14] Principles of Ayurveda basically unite human animal and nature perfectly with the concept of *Vasudhaiva Kutumbakam*.

15.0 Role of Ayurveda in one health approach

15.1 Preventive aspect ayurveda emphasizes dietary choices, daily routine, seasonal and ethical practices to maintain health and prevent diseases.

15.2 Treatment and management of disease through ayurveda using herbal remedies use of natural resources.

15.3 Ayurveda basically focus on Food safety, use of natural resources can contribute to strategies for addressing climate change and protecting ecosystem. The National One Health Programme for Prevention and Control of Zoonoses (NOHPPCZ) The programme was initiated with an objective to strengthen intersectoral coordination among medical, veterinary and wildlife sector to address zoonoses through joint capacity building activities, lab strengthening of the States for zoonoses, strengthening surveillance, data sharing and joint outbreak investigation and to undertake various Information, Education and Communication (IEC) activities, bringing together multidisciplinary experts on a common platform to build a consensus to have a structured, 'One Health' approach to respond to the zoonotic threats in the country.^[15] The misuse and overuse of antimicrobials in veterinary, human, and agriculture have accelerated AMR. Holistic efforts are required to address such issues related to One Health.^[16] National Health Policy 2017 (NHP 2017) supports these holistic efforts through its emphasize on "Pluralism," which enables patient to have access to Ayush care providers and ensure Government support in research and supervision to develop and enrich their contribution to meeting the national health goals and objectives through integrative practices. Recent efforts of developing country in addressing one health-related issues like pure air, stable climate, potable adequate water, sanitation and hygiene, safe use of chemicals, protection from radiation, healthy and safe workplaces, sound agricultural practices, health-supportive cities and built environments, and a preserved nature are all prerequisites for good health.

Challenges in one health implementation

Emergence of infectious diseases, antimicrobial resistance, and food safety ecosystems. These stressors include animal trade, agriculture, livestock farming, urbanization, extractive industries, climate change, habitat fragmentation and encroachment into wild areas and E-waste are major challenges.

Discussion

The COVID-19 pandemic has taken attention on the necessity of health issue of human, animals, and environmental and therefore there is call for work to expose zoonotic disease that require integrated and collaborative approaches of multiple sectors, disciplines and communities at varying levels. One-Health concept reveals deep insight of human, animal, and environmental health, tackling challenges such as zoonotic diseases and antimicrobial resistance. This holistic approach ensures a comprehensive strategy to health threats, fostering a more resilient health system. Vector-borne diseases (VBD) remain a significant public health challenge. In India, The Integrated Disease Surveillance Programme (IDSP) strengthens disease surveillance systems, enabling timely data collection and analysis. This program is critical for monitoring disease trends, detecting outbreaks early, and implementing control measures promptly, safeguarding public health. The National Vector Borne Disease Control Programme (NVBDCP) is dedicated to controlling diseases like malaria, dengue, and chikungunya. Through efforts on surveillance, prevention, and treatment, trying to control the incidence and impact of these diseases, protecting the health of millions. Effective disease surveillance is vital for early detection and response to health threats. Ayurveda traditional knowledge could be helpful integrated and collaborative approaches of multiple sectors, disciplines and communities at varying levels so as to one health concept can be strengthened by inter collaboration of various disciplinary including conventional and modern knowledge.

Conclusion

One Health is an approach is not only the health of humans but also animals and ecosystems by integrating these fields, rather than keeping them separate. Collaboration across sectors and disciplines through One Health approach is a vital solution for addressing the complex health challenges facing our society. To prevent, detect and respond to emerging health challenges, all relevant sectors must collaborate in an integrated manner to achieve together because no sector can achieve alone hence ayurveda has greatest potential to explore its knowledge in one health approach. One Health concept is comprehensive and encompasses overall health of all living beings as well as that of the environment. This includes issues such as food security, water quality, antimicrobial resistance, and climate change. These are also being handled globally through quadripartite and G-20 forum. It is demand of this era necessary to conduct high impact research and establish policies and guidelines for the safe and appropriate use of unwholesome things, integrate natural ayurvedic practices into mainstream health care, participation of healthcare providers, policymakers, researchers, and community members, play a major role to live the mother nature healthy. Therefore, for those of noble character the earth is their family called 'vasudhaivakutumbakam' the *Atharva veda* quote directly implies, "One World, One Health" stands for collaboration among human, animal and environment sectors across different scales (local, national and global) Being most developed creature on earth human has the capability to utilize their traditional knowledge to protect ecosystem by considering health of all creatures on earth aim for achieving the objective of good health for all.

अयं निजः परो वेति गणना लघुचेतसाम्।

उदारचरितानां तु वसुधैव कुटुम्बकम्॥ (षष्ठोऽध्यायः ७१- ७३ महा उपनिषद्)

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