

INDIAN HEALTH AND MEDICINAL SYSTEM: FROM ANCIENT INDIA TO PRESENT WORLD.

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ABSTRACT

Today we have number of therapeutic agents, techniques, methodologies and ways for treatment of different diseases but the astonishing aspect is that what was being done and how these diseases were cured and treated in the ancient time. Ancient Indian health system includes practice of yoga for maintaining balance of physical and spiritual energy/health, shastrakarma dealing with surgery and ayurveda. The ayurvedic treatment plans were having many valuable medicinal plants. Sushruta Samhita (6th century BC) describes 700 medicinal plants. Actually our past and present medicinal system is connected in some way like the ayurvedic plants which were the

treatment source are now undergoing the research for exploring their utility. The phyto-constituents of these plants are being processed for development of semi-synthetic analogues or the formulations of these are in market. Like the today's concept of digestion, metabolism and immune system the Charak Samhita also discuss it in detail. The present system is categorized on the basis of different systems of body like respiratory, digestive, reproductive, genetics etc. These were worked under category of root cause of disease of different system under the imbalance of three doshas-bile, phlegm and wind. The genetic concept of Charak and theory about blindness arising due to the defect in the ovum and the sperm is surprising here. Although deep insight shows connectivity of ancient and present era medicinal system yet the form and execution techniques and practice of medicines have been changed to a great extent. But if again moving back and capturing from our present we can generate a better fit for the health and medicinal system of future.

KEYWORDS: Ancient indian medicine, therapeutic agents, medicinal plants, semi-synthetic analogues.

1. Introduction to ancient indian health and medicine system

How medicine was transformed we can understand if we see its journey:

2000 B.C. – “Here eat this root”.

1000 B.C. – “That root is healthen, say this prayer”.

1850 A.D. – “That prayer is superstition, drink this potion”.

1940 A.D. – “That potion is snake oil, swallow this pill”.

1985 A.D. – “That pill is ineffective, take this antibiotic”.

2000 A.D. – “That antibiotic is artificial. Here, eat this root”.^[1]

What is ancient health and medicine system?

It includes:

- 1.1 AYURVEDA-The science of longevity
- 1.2 SHASTRAKARMA- The art of surgery
- 1.3 YOGA - Health of the body and mind

1.1 AYURVEDA-The science of longevity

Ayurveda is an ancient indian system of medicine, tried and tested over a few thousand years. It's a way of life that goes beyond addressing ill-health, to encompass a lifestyle conducive to good health.^[2]

Ayurveda = *Ayu* + *Veda*

Ayu= time from birth to death, Veda= knowledge.

Ayurveda literally means Ayu (time from birth to death) and Veda (knowledge or learning).^[3] Its distinctive feature is sole dependence on herbs and herbal compounds. *Charaka* (the first physician) presented the concept of digestion, metabolism and immunity and discussed about physiology, etiology and embryology in his book '*Charak samhita*'. Illness is the result of imbalance among the three *dosha* namely, bile, phlegm and wind and medicinal drugs can restore this balance. Charaka also knew the fundamentals of genetics. For instance, he knew the factors determining the sex of a child. A genetic defect in a child, like lameness or blindness, he said, was not due to any defect in the mother or the father, but in the ovum or sperm of the parents which is today an accepted fact. Dhanvantari the practitioner of this art of healing was deified as the God of Medicine even ordinary practitioners of this art - the

Ashwini kumars - were given a special status in mythology and folklore.^[4] Purpose of ayurveda is to maintain the health and cure the disease.^[5]

1.1.1 Ayurvedic definition of health and disease

Rogastu Doṣavaiṣamyam Doṣa Sāmyam Arogatā |

Tridosha Imbalance in is disease. Perfect balance is health.

1.1.2 Types of medicines according to ayurveda

Śodhanam Śamanam Ceti Samāsāt Auśadham Dvidhā || Śarīrajānām Doṣāṅām Krameṇa Paramauśadham | Basti: Vireko Vamanam Tathā Taila Ghṛtam Madhu: ||

There are two types of medicines.

1. **Shamana** – Palliative treatment – which brings the *dosha* to normalcy, useful in initial stages of diseases.

2. **Shodhana** – Purification treatment – which expels imbalanced *dosha* out of body. – Useful in aggravated stages of diseases.

Examples

For *Vata* – *Basti* (suppositories) is the *Shodhana* treatment, and oil is *Shamana* treatment.

For *Pitta* – *Virechana* (Purgation) is *Shodhana* and Ghee is *Shamana*.

For *Kapha* – *Vamana* (emesis) is *Shodhana* and Honey is *Shamana*.

1.1.3 Purpose of life: Essential quality to learn ayurveda

Āyu: Kāmāyamānena Dharmārtha Sukhasāadhanam | Āyurvedopadeśeṣu Vidheya: Paramādara: |

The purpose of life is

- Dharma – following the path of righteousness
- Artha – earning money in a legal way
- Kama – fulfilling our desire
- Moksha – achieving Salvation,

To achieve this purpose of life, one should concentrate on having a long life. To learn the science of Ayurveda, which explains how to achieve this purpose, ‘obedience’ (*Vidheya*) is the most important quality.

1.1.4 Branches of ayurveda

Kāyabālagrahordhvānga Śalyadaṃṣṭrā Jarāvṛṣān || Aṣṭāvāṅgāni Tasyāhu: Cikitsā Yeṣu Saṃśritā

1. **Kaya Chikitsa** – General medicine
2. **Bala Chikitsa** – Paediatrics
3. **Graha Chikitsa** – Psychiatry
4. **Urdhvanga Chikitsa** – Diseases and treatment of Ear, Nose, Throat, Eyes and Head (neck and above region)
5. **Shalya Chikitsa** – Surgery
6. **Damshrta Chikitsa** – Toxicology
7. **Jara Chikitsa** – Geriatrics
8. **Vrushya Chikitsa** – Aphrodisiac therapy.^[6]

These eight sections are called "Astanga Ayurveda".^[2]

1.1.5 Body tissues and waste products

Rasa Asrk Māṃsa Medo Asthi Majja Śukrāṇi Dhātava: | Sapta Dūṣyā: Malā: Mūtra Śakṛt Svedādayo 'pi Ca ||

Body tissues and waste products are called as *Dushyas*. Means, there are influenced and affected by Doshas. Body tissues are –

- **Rasa** – the first product of digestion, Soon after digestion of food, the digested food turns into Rasa. It is grossly compared to lymph or plasma. But it is not a complete comparison.
- **Rakta** – Also called as *Asruk*. – Blood
- **Mamsa** – Muscle
- **Meda** – Fat tissue
- **Asthi** – Bones and cartilages
- **Majja** – Bone marrow
- **Shukra** – Semen / Ovum or entire male and female genital tract and its secretions are grossly covered under this heading.^[6]

1.2 SHASTRAKARMA- The art of surgery

(*Shastrakarma*) is one of the eight branches of Ayurveda the ancient Indian system of medicine and has been recorded in India around 800 B.C. The oldest treatise dealing with surgery is the *Shushruta-Samahita* (*Shushruta's* compendium). *Shushruta* was one of the first

to study the human anatomy and worked on rhinoplasty (Plastic surgery) and ophthalmology (ejection of cataracts).

Eight heads of surgery were

- *Chedya* (excision)
- *Lekhya* (scarification)
- *Vedhya* (puncturing)
- *Esya* (exploration)
- *Ahrya* (extraction)
- *Vsraya* (evacuation)
- *Sivya* (Suturing)

1.3 YOGA - Health of the body and mind

Yoga is a system of exercises for physical and mental nourishment. The term Yoga is itself derived from the Sanskrit word "*yoktra*" meaning a yoke. The self-discipline aspect of Yoga are:

- Holding the breath (in Pranayama)
- Absolute stillness (in Shavasana)
- Celibacy (Bramhacharya)

It was as early as the 2nd century B.C. i.e. 2100 years ago that the fundamentals of Yoga were systematically presented. The person who is credited with having done this is Patanjali and his treatise is known as *Yogasutra* giving eight stages as

- *Yama* (universal moral commandments),
- *Niyama* (self-purification through discipline),
- *Asana* (posture),
- *Pranayama* (breath-control),
- *Pratyahara* (withdrawal of mind from external objects),
- *Dharana* (concentration),
- *Dhyana* (meditation) and *Samadhi* (state of super-consciousness).^[4]

2. Introduction to ayurvedic medicinal plants and their therapeutic role

Ghrit kumara (*Aloe barbadensis*), sargandha (*Rauwolfia serpentina*), brahmi (*Bacopa monnieri*), tulsi (*Ocimum sanctum*), gugglu (*Commiphora mukul*), amla (*Emblca officinalis*), ashwagandha (*Withania somnifera*), arjun tree (*Terminalia Arjuna*), turmeric (*Curcuma longa*, figure 1), neem (*Azadirachta indica*) etc. are the some examples out of the list of the medicinal plants which were the part of our ancient medicinal system^[7] and surprisingly it is shown that the phytochemicals found in these plants were able to fight with a number of diseases as shown in figure2.^[8]



Figure 1: Turmeric powder; a source of curcuminoids.

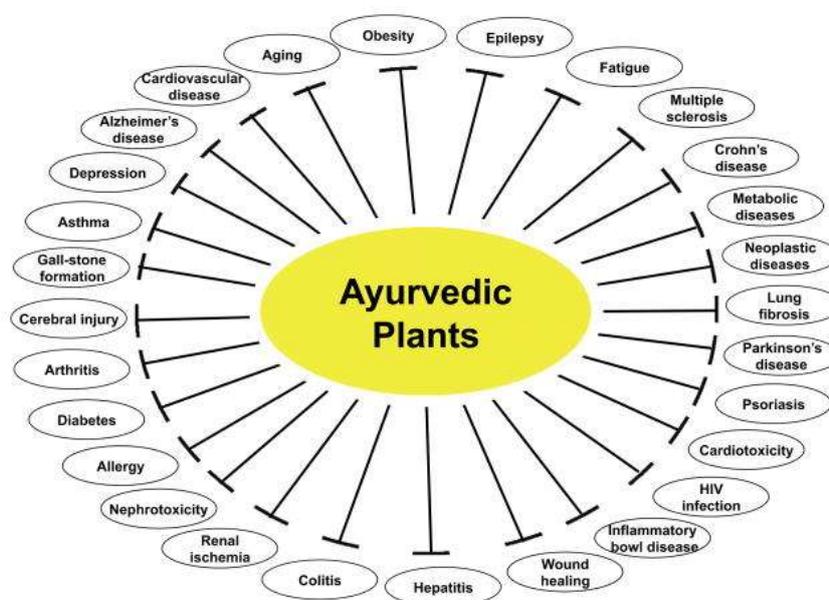


Figure 2: Diseases which were treated with ancient Indian plants.^[7]

The Indian system of medicine was not about illness and standalone treatment multi-dimensional combination of diet, climate, beliefs, supernatural, empirical and culture for treatment of the person.^[9] A single species is having its role in different bio-space so find its place for treatment of multiple diseases.^[10]

3. Present status about the effectiveness of ayurvedic medicine research

The problems associated with research designs, or lacked appropriate control groups causes the decrease in number of Ayurvedic research but carried out clinical trials supports the Ayurvedic approaches.

- Researchers found inconclusive scientific evidences for Ayurvedic approaches for schizophrenia and diabetes.
- A *clinical trial* in 2011, funded in part by NCCIH, showed the similar effectiveness of 40 herbs in an Ayurvedic treatment and methotrexate for treatments of rheumatoid arthritis.
- With the limited research, clinical trial presented the role of turmeric in digestive disorder and arthritis, which support the use of turmeric for inflammatory conditions in Ayurveda.
- A 2011 preliminary clinical trial found that osteoarthritis patients receiving a compound derived from *B. serrata* gum resin had greater decreases in pain compared to patients receiving a placebo.^[11]

4. Research bridging ancient and present medicinal system: exploration of ancient bioactive molecules as semi-synthetic analogue

Many *Taxus* species (Himalayan Yew) have been claimed to be used in treatment of cancer in Ayurveda practices. Ayurvedic medicinal plants exert their activity by means of activation or inactivation of signaling pathways. Thousands of years ago, Ayurvedic medicinal system used many medicinal plants in the treatment of cancer (when there was no modern medicinal knowledge existed). Drugs derived from many of these traditional plants are now well established inhibitors of the targets responsible for different cancers such as *Vinca rosea* and *Taxus* species were widely used in the treatment of different cancer types. Vincristine and paclitaxel isolated from these plants showed strong anticancer properties.^[12]

Paclitaxel (Taxol), a terpenoid, a member of a natural organic family of chemicals, is isolated from the bark of the slow growing and endangered *Taxus* species. It is commonly used for treating a variety of cancers and it is under evaluation for the treatment of Alzheimer's disease and coronary heart disease also. Unique activities of paclitaxel are that it binds to β -

tubulin in the microtubule specifically and reversibly with a stoichiometry of almost one (relative to the α,β - tubulin dimer), inhibits cell division, blocks cell mitosis, stabilizes cytoplasmic microtubules, and induces the formation of the characteristic microtubule bundles in cells.^[13] Two novel taxol derivatives with substituted phenyl rings at the C-13 N-benzoyl-(2'R,3'S)-3'-phenylisoserine side chain were synthesized, one possessing a N-(p-chlorobenzoyl)-(2'R,3'S)-3'-phenylisoserine side chain and the other one a N-benzoyl-(2'R,3'S)-3'-(p-chlorophenyl)isoserine side chain. These have shown good anticancer activity.^[14]

Another commonly used natural compound is curcumin (from the plant *Curcuma longa*, a well known plant in ayurvedic text) as shown in figure 3, is known for its antioxidant, anti-inflammatory, antiviral, antibacterial, antifungal and anticancer activities and potentially combat various other disorders including diabetes, allergies, arthritis and Alzheimer's disease.

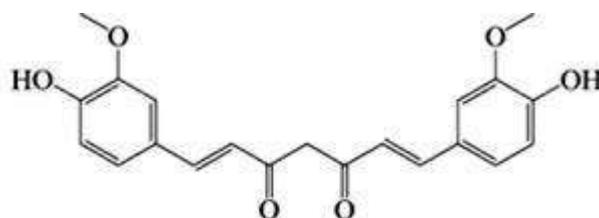


Figure 3: Structure of Curcuminoid.

Recent studies reported that curcumin decreased survival of RT4V6 and KU7bladder cancer cells in part at least through increased DNA fragmentation and other parameters associated with apoptosis.^[13]

Garlic [*Allium sativum*] is a remarkable plant, which possess antimicrobial, antithrombotic, hypolipidemic, antiarthritic, hypoglycemic and antitumor activity. The chemopreventive activity has been attributed to the presence of organosulfur compounds in garlic. The mode of action is not very understood but include its effect on drug metabolizing enzymes, antioxidant properties and tumor growth inhibition. Recently, it has been observed that aged garlic extract, but not the fresh garlic extract, exhibited radical scavenging activity. The two major compounds in aged garlic, S-allylcysteine and S-allylmercapto-L-cysteine, had the highest radical scavenging activity. In addition, some organosulfur compounds derived from garlic, including S-allylcysteine, have been found to retard the growth of chemically induced and transplantable tumors in several animal models.^[15]

Resveratrol (3,4',5-trihydroxy-trans stilbene, a component of “*Darakchasava*,” an ancient Ayurvedic herbal formulation)^[16] is a compound belonging to the stilbene class of aromatic phytochemicals existing in cis and trans forms. It is predominantly found in nature in peanuts (*Arachis hypogaea*). It has ability to inhibit cyclooxygenase (COX) activity is resveratrol. It suppresses TNF- α -induced activation of nuclear transcription factors NF- κ B, activator protein-1 (AP-1) and apoptosis, suggesting a potential role in reducing oxidative stress and lipid peroxidation.^[17]

Structure of quinine is the basis for the synthesis of the novel potent anti-malarial compounds. Some of these are mentioned in figure 4.

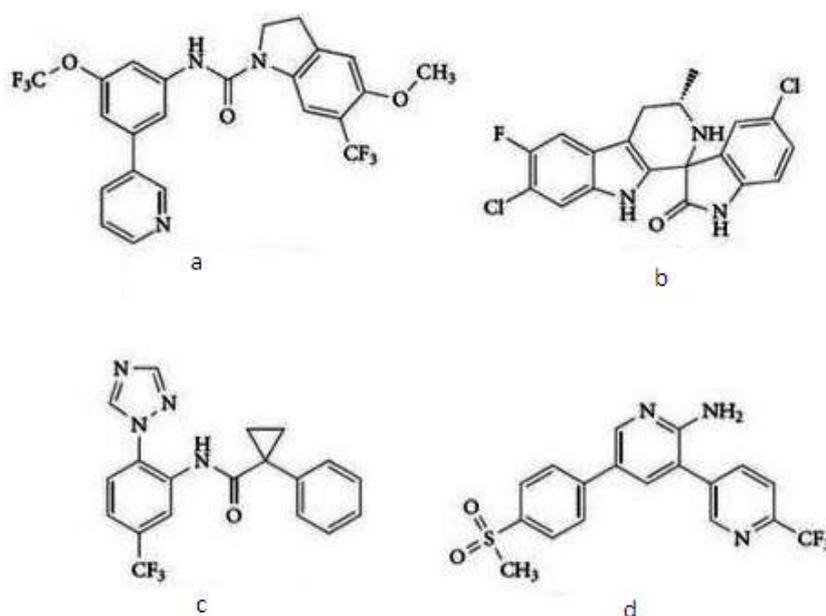


Figure 4: Structure of some novel anti malarial drugs a) TCMDC-139046 IC_{50} 80nM, b) NITD609 (KAE609) IC_{50} 0.7Nm, c) GSK1057714 IC_{50} 102Nm, d) MMV390048 IC_{50} 25nM.

The most promising molecule, KAE609 (also called NITD609), is in Phase II and is potent enough to cure *P. berghei*-infected mice with a single oral 100 mg/kg dose and prevents transmission.^[18] Another such example is found with the modification of lactone ring.^[19] *Digitalis purpurea* is known as **HRUTPATRI** in Ayurveda which is having potent effect on cardiac activity.^[20,21] The lactone ring at C₁₇ has been considered for a long time to be responsible for inotropic activity, bringing about conformational changes on the enzyme that would give rise to its inhibition. The replacement by other heterocycles in some semi-synthetic derivatives changes its interaction energy.^[19]

5. India's stand on ancient healthcare information

India believes in sharing knowledge and **the right to good health to all**. But to protect these from illegal copyrights, etc and safeguarding traditional remedies, India has embarked on the Traditional Knowledge Digital Library (TKDL).

The digitized format of documented traditional knowledge of Ayurveda, Unani, Siddha and Yoga, is available in five international languages which are English, German, French, Japanese and Spanish.

Traditional Knowledge Digital Library (TKDL)

- TKDL is a central platform to prevent the grant of wrong patents by providing information on traditional knowledge existing in the country, in languages and format understandable by patent examiners at International Patent Offices (IPOs).
- TKDL is a bridge between the traditional knowledge information existing in local languages and the patent examiners at IPOs.
- TKDL's aim is to encourage genuine innovation by preventing traditional knowledge from being passed off as invention.
- Governing bodies of TKDL are:-
 - Council of Scientific and Industrial Research (**CSIR**),
 - Ministry of Science and Technology and Department of **AYUSH**,
 - Ministry of Health and Family Welfare and is being implemented at CSIR.^[1]

5. CONCLUSION

The different aspects of ancient health system were been helpful to human being including the complete areas of health i.e. physical, mental and spiritual. By the time the treasure of magical knowledge of ayurveda has been lost somewhere. But its come back may lead to opening of new doors for treatment of several incurable diseases also. An effort in this area could be bridging or linking up of our ancient medicinal system with the present one. As we have seen in the present article that ayurveda includes treasure of many valuable medicinal plants. When we go for the approach of finding suitable receptor binding ligands then these ayurvedic herbs must be explored first in search of valuable template for developing semi-synthetic analogues. This approach from past to present will definitely proved to be fruitful in future.

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