

INTRODUCTION

Complementary and alternative medicine (CAM) is not routinely taught in conventional medical schools. It is used by over 30% of rheumatology patients across the world. Indian Systems of Medicine are presently called as AYUSH (Ayurveda, Yoga, Unani, Siddha and Homeopathy) and their training is imparted through institutions and universities approved by government. A large survey of 45000 patients from 35 selected districts across India showed that about one third patients preferred indigenous medical systems (18.7% Ayurveda, 1% Siddha/Unani) and Homeopathy (12.7%) for common ailments¹. A survey by Government of Delhi (<http://delhiplanning.nic.in/Reports/Ayurvedic.pdf>) indicates that 13.8% of all patients (n=212) attending Ayurvedic dispensaries are those of arthritis (next to GI disorders 15%). Two Indian studies in patients of rheumatoid arthritis indicate usage of CAM in nearly 40% cases^{2,3}, indicates usage of alternative therapy whereas another report of case records by 72% patients. Ayurveda (28%), Homeopathy (20%), Yoga (17%) and Pranayama (12%) are most preferred alternative therapies in rheumatoid arthritis⁴. Some patients also use Siddha, Tibetan and Chinese medicine. Medical practitioners all over world now have a more open attitude towards alternative therapies as research in these fields is growing both qualitatively and quantitatively. It is, therefore, necessary for Indian practitioners to recognize significance of these medical systems and include evidence-based modalities in their day to day practice.

Common fundamentals

The basis of these therapies covers a varying degree of soul-mind-body medicine. The emphasis is on restoring harmonious balance of diverse physiological determinants of health. The philosophical foundation of these determinants may vary slightly across the systems. However, the text of AYUSH therapies deals with fundamental axioms in a logical sequence. Traditional medicine views human beings (microcosm) as a part of universe (macrocosm) and further that change in universe affect human beings directly or indirectly.

It views disease as imbalance between the body and the milieu rather than Unitarian microbial or biochemical etiology. Therapy is directed to reestablish this balance. Emphasis on disease prevention rather than treatment, maximization of inherent healing capacity, individualized diagnosis and disease management with complex modalities are some of the peculiarities of these therapies.

The patient factor

Users of alternative medicine are generally of two types: 1) disease-specific users i.e. intending to treat the disease and 2) general health users ('good for health') due to cultural and other reasons. Sources of CAM include friends and relatives, medical doctors, books and magazines, newspapers, television and Internet. Pharmacoepidemiological studies have indicated various factors that influence patient decision to use CAM (Table 1).

Table 1. Factors influencing decision of CAM usage

Ethnicity e.g.non Hispanic whites in RA	Female sex
Higher income	Age under 55 years
Higher literacy	Earlier age of diagnosis
Perceived 'no side effects' of treatment	Longer duration of disease
'No cure' in allopathy	Poorer functional status
Lower cost of treatment	Higher level of pain
	Sleep disturbances

Patients can use multiple therapies at the same time. Many CAM users use therapies as self-medication and OTC purchase of medicine rather than approaching a CAM therapist whereas some patients continue drug usage without a follow up visit to the practitioner. Most patients do not reveal usage of CAM to the treating physician unless specifically enquired into. Patient satisfaction with CAM, though considerable, does not necessarily mean improvement in disease condition. Discontinuation of therapy is usually attributed to lack of clinical benefit and occasionally to adverse events. Patients who use allopathic medicine perceive 'slow cure' as the main reason for not preferring indigenous systems.

Adverse events and related issues

A) *Heavy metal contamination*: Lead (*Naga*), mercury (*Parada*) and arsenic (*Hartala*, *Manshila*, *Somal*) are the metals of concern found in indigenous drugs. Mercury is a component of innumerable drugs whereas lead is used in antidiabetic, aphrodisiac, nervine tonics and other preparations. Lead is an important constituent of Mahayograj guggulu and Vatavidhwans, commonly used by Ayurvedic practitioners for degenerative and inflammatory arthritis respectively.

To make them bio-compatible, Ayurvedic texts describe various purification processes before use of these metals. Metal containing drugs must be used under strict expert supervision in small doses for a limited period of 2-3 months only. Inappropriate detoxification and prolonged administration by way of self-medication seem to be determining factors. It must be emphasized that lead is found, as in case of vegetables, in pure herbal (nonmetal) compounds too. Environmental contamination (pesticides, fuel, paints, rubber, plastic, etc.) must be taken into account while evaluating clinical safety of AYUSH drugs.

- B) *Potential drug interactions* : Ginger and garlic have antiplatelet and other anticoagulant effects. Increase in risk of NSAIDs or steroid related bleeding needs further evaluation.
- C) *Adulteration* : Many reports indicate presence of steroids in Ayurvedic products. Charak calls such physicians as *Chadmachar* (dishonest, deceptive, fraudulent, feigned physicians-quacks).
- D) *Cost of therapy* : Cost of CAM therapy varies widely and higher prices do not necessarily mean more effective treatment. This leads to wastage of valuable resources in some cases.
- E) *Delay in diagnosis* : Delay in seeking medical help while pursuing alternative therapies can be detrimental and may at times be life-threatening. This is especially true in early rheumatoid arthritis, inflammatory connective tissue diseases presenting as arthralgias, lupus nephritis and vasculitis.

The future

There is increasing global interest in traditional systems of medicine. Many hospitals are initiating CAM services and universities introducing training programs in recent times. Government of India is

also planning to introduce basic principles and concepts of Indian systems of medicine and Homeopathy in MBBS curriculum. World health Organization has pledged itself to foster a realistic approach to traditional medicine and to promote the integration of proven valuable knowledge and skills in traditional and western medicine. Indian Medicine is a dynamic and experientially proven holistic system of health care. Its rich phytopharmacy offers an immense scope for reverse pharmacology and new drug development. Aspirin and colchicin are plant derived molecules. Some other Indian plants are currently under intense research, nationally and internationally. Evidence based practice of traditional medicine can be easily implemented with more research and scientific approach. Synergistic and integrated functioning of different systems of medicine can then follow after identification of appropriate role of each of these systems for promotion of health as well as prevention and treatment of diseases.

The following write-up deals with relevant fundamentals and therapies along with important evidence in each of AYUSH and some other systems. More details are available in literature devoted to these sciences. Some other therapies such as music therapy, aroma therapy, hydrotherapy, massage, magnet therapy, etc. could not be included due to technical reasons. Many clinical and experimental studies in Indian medical systems are published in Ayurvedic journals, publications in regional languages, Indian scientific journals (non-indexed) and in other literature such as post-graduate and doctoral thesis. This work is difficult to locate in net-searches although the literature is substantial.

AYURVEDA

Ayurveda⁵ is a health care system prevalent and being practiced in India and its subcontinent since ancient times. Ayurveda (Sanskrit: *Ayu*-life, *Veda*-to know) is a knowledge system to understand life. Its purpose is to protect health, prevent diseases and restore life. The fundamental axioms of Ayurveda are primarily derived and developed from ancient Indian philosophical systems viz. *Sankhya*, *Vaisheshik*, *Nyaya*, *Yoga*, *Vedant* etc. Ayurveda is based on various important fundamental principles. Charak Samhita (1500 BC), Sushrut Samhita (1000 BC) and Ashtanga-hridaya (150 AD) are the main Ayurvedic reference texts of ancient times, while Madhavanidana (700 AD), Sharangdhar Samhita (1300 AD) & Bhavaprakash Nighantu (1700 AD) are important reference books of relatively recent period of medieval.

Relevant fundamentals

Panchamahabhoota doctrine proposes that entire universe is made up 5 basic elements viz. *Pruthvi*-Earth, *Aap*-water, *Teja*-fire, *Vayu*-air, and *Aakash*-space. Every substance, living or non-living, is made up of these five basic elements called *Panchamahabhoota tatva*. The living beings have, in addition, *chetana tatva* which is made up of *manas* (mind) and *aatman* (spirit). Entire human body and its physical constituents are made up of these five basic elements. Ayurvedic physiology is largely explained in terms of *dosha*, *dhatu* and *mala*. *Vata*, *Pitta* and *Kapha* are the three doshas (vital biological forces) which govern every living body. *Vata dosha* is the supreme amongst these three *dosha* and is manifested by all bodily movements and functions. *Pitta dosha* is manifested by biotransformation and metabolism while *Kapha dosha* is manifested by cohesiveness of body constituents. Homeostasis of these *dosha* brings health whereas imbalance leads to disease. Human body is constituted of 7 basic tissues called *dhatu*. These are *rasa*-plasma, *rakta*-blood, *mamsa*-muscles, *meda*-fat, *asthi*-bone, *majja*-marrow and *shukra*-sperm/ovum. Quantitative and qualitative optimization of these tissues is desirable to maintain health and longevity. *Mala* are waste products which are separated from body tissues and are excreted out of the system.

The maintenance of human body depends on the kind of food intake and food is also made up of *panchamahabhoota*. *Agni*, present in human system, is responsible for digestion, metabolism and assimilation of food substances. *Agni* is broadly classified into 3 types viz., *Jatharagni*, *Bhootagni* and *Dhatwagni*. *Jatharagni* is primarily responsible for digestion of food substances, *bhootagni* plays a major role in the process of metabolism to make these food substances bio-compatible, while *dhatwagni* contributes in the assimilation of these digested and metabolized food products into specific tissue components. The entire process of bio-transformation & transportation takes place in *srotas* (body channels). Human system is made up of innumerable body channels-gross or subtle. An exemplary gross body channel is the gut, also called as '*maha-srotas*'. Obstruction in or derangement of any *srotas* and hypo functioning of *agni* are the major contributors in the pathogenesis of a disease. Ayurvedic pathophysiological concept of *aam* is more relevant in the context of inflammatory connective tissue diseases. *Aam* is a toxic substance generated in the human body due to several factors such as improperly digested food substances

within gastro intestinal tract, inadequately biotransformed macro molecules within circulation and inefficiently cleared waste products retained in body tissues. Inadvertently ingested or injected non food substances also have potential to produce '*aam*' in human system. *Aam*, which can be correlated with antigenic substances or antigen-antibody complexes, is considered to be central pathogenic factor responsible for many diseases. Pain is a cardinal manifestation of rheumatic diseases and so is a feature of dominance of *Vata dosha*. *Vata dosha* (Sanskrit: *Va-* to move) is considered as the supreme one amongst the *tridosha* i.e. *Vata*, *Pitta* and *Kapha*. It governs all the bodily functions, anabolic and catabolic. *Vata dosha* tends to increase by diverse reasons pertaining to diet, lifestyles, climatic conditions and age. It can also get aggravated or vitiated secondary to other diseases and mental or physical trauma. Bitter, pungent and astringent food items, stale and stored food substances, hectic lifestyle and frequent traveling, cool and dry climate, advancing age etc are *Vata* aggravating factors. Although the major site of *vata dosha* is the pelvic region, its predominance also exists in bones, thighs, ears and skin. Based on its functional territories *Vata dosha* is further sub-typed into five varieties-*Prana*, *Vyana*, *Udana*, *Samana* and *Apana*.

Several classical diagnostic methods described in Ayurvedic texts are primarily clinical. Emphasis is essentially on analyzing the *dosha* involvement ascertaining the affection of *dhatu* (various body tissues/organ/system) and evaluating functional abilities of excretory systems with status of waste products. The balance between *Rugna-bala* (General resistance power and immunological status) and *Vyadhi-bala* (Virulence of causative factors and severity of pathogenesis) determines the prognostic outcome. Human constitution (*Prakruti*) is considered important to decide individual treatment.

Management principles are as follows:

1. *Nidaana parivarjan* - avoiding causative and precipitating factors
2. *Sanshamana chikitsa* - restoration the physiological homeostasis through drugs, dietary (*Ahara*) and behavioral (*Vihara*) modification
3. *Sanshodhana chikitsa* - expelling out increased and vitiated dosha or toxins for correcting the human system
4. *Rasayana chikitsa* - reparative & rejuvenative medicine

Rheumatology in Ayurveda

Details of 360 bones and 210 joints in human body are described in Sushruta Samhita. Joints are categorized mainly into two types viz., *chala* (diarthrosis) & *sthir* (fixed); which are further classified into pivot joints, gomphosis, sutures etc. Synovial membrane (*sleshmadhara kala*), which secretes synovial fluid (*sleshaka kapha*) is also described. Clinical features of arthritis viz. pain, swelling and stiffness are described as *Sandhigata vata*. Several such clinical syndromes mentioned in Ayurvedic literature can be classified under the category of rheumatic diseases. Table 2 gives a shortlist of these Ayurvedic diseases comparable with conventional rheumatic conditions. *Sandhigata vata* and *Aamvata* are prototypes of noninflammatory and inflammatory arthropathies respectively. Bhruhu Samhita describes synovial fluid along with its diseases and remedies. Detailed clinical description and etiopathogenesis of *Aamvata* was mentioned first in Madhav Nidaana whereas principles of treatment were described by Chakradatta (1100 AD). *Vatarakta* is another clinical condition described in most of the classical Ayurvedic texts. Clinical features of *Vatarakta* (*Gambhir*) are akin to those of acute gouty arthritis whereas other types are comparable with systemic connective tissue diseases and vasculitides.

Table 2 : Modern rheumatologic disorders in Ayurveda

<i>Sandhigata vata</i>	Osteoarthritis
<i>Aamvata</i>	Rheumatoid arthritis
<i>Vatarakta</i>	Systemic connective tissue diseases
<i>Kroshtukasheersha</i>	Infective arthritis
<i>Grudhrasi</i>	Sciatic neuralgia
<i>Avabahuk</i>	Frozen shoulder
<i>Vishvachi</i>	Brachial neuralgia
<i>Vatakantaka</i>	Heel pain
<i>Manyastambha</i>	Torticollis
<i>Katishool</i>	Low back pain

Aamvata

Aamvata (inflammatory arthritis including spondyloarthropathies) is described in Madhav Nidaana as follows: An individual, having suboptimal metabolic capacity (including genetic predispositions), when exposed to incompatible food and contradictory physical activities leads to the generation of *aam*. This *aam* gets further vitiated by *tridosha* to form '*dooshit aam*' (equivalent of immune complexes). *Dooshit aam*,

under the influence of *vata*, tends to get lodged particularly at the sites of *Sleshma sthaana* (connective tissues and joints) to produce *Aamvata* (immunoinflammatory rheumatic diseases). In advanced cases (*Atyartha vidagdha*), arteries and blood vessels are also influenced (*dhamni pratipadhyate*).

Six treatment modalities are advised for *aamvata*. These are *langhana* (fasting), *swedana* (fomentation), *tikta-dipan-katu dravya* (medicinal substances with specific activity against *aam*), *virechana* (laxation), *sneha-paan* (oleation) and *basti* (medicated enemas). The former 3 modalities are primarily targeted against '*aam*' whereas the later 3 are targeted against *Vata* component of the disease. These treatment modalities are recommended in a sequential order for early disease. In chronic and advanced cases, these modalities can be implemented in combinations and not necessarily in sequential order. *Langhana*, *virechana* and *basti* are contraindicated in certain circumstances. Several formulations are indicated for *aamvata* in classical Ayurvedic texts. Table 5 gives list of selected formulations commonly used in *aamvata*.

Sandhigata vata

Sandhigata vata is a prototype of non-inflammatory, degenerative joint diseases. *Vata* aggravating factors including senility lead to derangement of *vata dosha* which influences the *Asthi dhatwagni* (bone and cartilage related metabolic processes). This adversely affects the metabolic homeostasis of cartilage in favor of degradation (*hanti sandheen*). Continuation of *Vata* aggravating factors accelerates the process of 'joint failure'.

Management of *sandhigata vata* includes avoidance of *vata* aggravating factors (*nidaana parivarjan*) and external as well as internal treatment. External treatment is essentially oil massage, medicated steam, local application of medicines and local heat therapy. In cases of inflammatory effusions, massage is avoided and medicines recommended in *aamvata* are used. *Basti* (medicated enema) of decoctions and oils is also frequently recommended for different treatment durations. Internal treatment includes oral medications having *anti-vata* and *asthi rasayana* (bone and cartilage promotive and protective) properties. See table 6 for commonly prescribed formulations in *sandhigata vata*.

Asthi-kshaya

Asthi-kshaya (loss/waning of bones) is a prototype of osteoporosis and other metabolic bone diseases. A proper diet is essential for healthy bones as all *dhatu*s including *Asthi* are manufactured from food by respective *Agni* (parathormone, vitamin D, etc). Senility leads to Asthi-kshaya due to *Vata*-dominance. Other factors such as female hormones and advantages of exercise are also indicated in literature⁶. Loss of hair, nail abnormalities, dryness, bone pains, joint laxity and fatigue are described as clinical features. The therapy is directed to osteoid with oral or rectal (*Basti*) oleation and use of bitter drugs such as Guduchi (*Tinospora cordifolia*), Nimba (*Azadirachta indica*), Ativisha (*Aconotum heterophyllum*) and marine products like *Praval* (Coral), *Shankh* (Conch shell), *Shukti* (Pearl oyster), etc. Many of these plants contain significant quantities of phytoestrogens where as marine products are cheap sources of natural calcium. A few selected scientific and research evidences regarding anti-rheumatic activity of plants, formulations and therapies in Ayurveda are summarized in following paragraphs.

Guggulu

Guggulu (*Commiphora wightii*) is the most commonly prescribed anti-rheumatic drug in Ayurvedic clinical practice. Several in-vitro and in-vivo experimental studies have documented its anti-inflammatory, anti-arthritis, immunomodulatory, hypolipidemic, antiatherogenic activity. Guggulu extracts have shown to induce down regulation of macrophage released TNF-alpha & IL1beta in-vitro model⁷. Guggulu is combined with other drugs in various formulations used in arthritis. 11 out of 26 refractory cases of erosive RA treated with Yogaraj Guggulu (3-6 gm/d) over a period of 6 months showed significant improvement in Ritchie's articular index, swelling score and pain score. No significant adverse drug reactions (ADR) were noted. An observational study⁸ of guggulu compounds (Yogaraj and Gokshuradi, 2-4 gm/d) in patients of RA and Osteoarthritis (OA) reported ADRs in 19 out of 225 patients, gastritis and dermatitis being the most frequent.

Bhallatak

Bhallatak (*Semecarpus anacardium*) is a potent but potentially toxic plant. Severe allergic reactions are known. However, several experimental investigations indicate its anti-inflammatory, anti-arthritis, antioxidant, immunomodulatory,

anticytokine, chondroprotective and anti-cancer activity⁹. A 4-week clinical trial with Bhallatak-processed milk (*ksheerapak*) showed positive response in cases of peri- arthritis of shoulder, sciatica, RA and ankylosing spondylitis. However, the study reports ADRs in 25% of patients in the form of itching, maculo-papular rashes, urethritis and stomatitis¹⁰. Another classical formulation, Amrut-Bhallatak, showed substantial pain relief in more than 60% patients of OA (n=45) in a 6-week study. Persistence of pain relief after withdrawal of drug and reproducibility of the results on reintroduction of medicine were interesting findings.

Ginger

Ginger (*Zingiber officinalis*) is a common culinary spice used across different cultures. Amongst diverse clinical effects, anti-emetic and anti-inflammatory are the two prominent activities documented¹¹. Ginger modulates biochemical pathways activated in chronic inflammation and inhibits chemokine expression in human synoviocytes. Ginger root extract has inhibitory effects on Nitric oxide and prostaglandin E₂ production by sow osteoarthritic cartilage. Ginger extract showed moderate effect in OA knee with good safety profile and mild gastrointestinal adverse events in a 6 week double blind placebo controlled, randomized multi-centric study¹² of 261 patients.

Ashwagandha

Ashwagandha (*Withania somnifera*) root is a reputed *Rasayana* plant in Ayurveda. It possesses anti-inflammatory, anti-tumor, antistress, antioxidant, immunomodulatory, hemopoietic and rejuvenating properties with little or no associated toxicity. Aqueous suspension of root powder showed potent inhibitory activity towards complement system, mitogen induced lymphocyte proliferation and delayed type hyper sensitivity reaction in rat model¹³. A 32 week, randomized, placebo controlled clinical study of a compound containing Ashwagandha in patients of knee OA showed significant efficacy over placebo group with no significant adverse events¹⁴.

Turmeric

Turmeric (*Curcuma longa*), a common spice of Indian diet, has been used in Ayurvedic medicine for diverse indications. Curcumin, an active ingredient, is a potent immunomodulatory agent. It down regulates the expression of various proinflammatory cytokines¹⁵, prevents

experimental RA and has shown beneficial effects in patients of RA in a preliminary study¹⁶. Herbal¹⁴ and herbo-mineral formulations of turmeric have shown efficacy in OA in double blind placebo controlled clinical studies.

Other formulations

Innumerable studies have been carried out on various plants and formulations (classical and proprietary) in rheumatologic disorders. Anti-inflammatory effects of Nirgundi (*Vitex negundo*), Pippali (*Piper longum*), Rasna (*Inula helenium*), Guduchi (*Tinospora cordifolia*), Eranda (*Ricinus communis*), etc are well established and require further clinical evaluation. Various guggulu compounds, gold-*bhasma*, Triphala, Vaishwanara choorna, Sukumar ghrita and many other drugs including those listed in Tables 3 and 4 need more clinical studies with larger sample size as reliability of present data appears questionable.

Fasting and diet

Fasting (*Langhana*) is an important and early intervention recommended in Ayurvedic treatment for inflammatory rheumatic diseases especially RA. Modification of diet by eliminating certain food items is also a common practice. Fasting up to 7-10 days has shown significant clinical improvement. Ayurvedic fasting therapy is always followed by *sansarjan-krama* (gradual reintroduction of food). Continuation of beneficial response following fasting is observed on subsequent meticulous dietary manipulation¹⁹. Individualised dietary revision regulates TNF-alpha and IL-1-beta in selected RA patients. Hypoallergenic protein-free diet over 2 weeks has shown clinical improvement in RA patients similar to prednisolone 15mg./day¹⁸.

Table 3: Classical Ayurvedic formulations commonly used for 'Aamvata'

Name of the formulation	Nature of formulation	Average dose/day
Yogaraj Guggulu	Herbal; tablets/pills	500mg-1gm t.i.d.
Arogyavardhini	Herbo-mineral; tablets/pills	250-500mg t.i.d.
Eranda shunthi	Herbal; oil powder	5-7.5ml o.d. 2-3gm o.d.
Sinhananda Guggulu	Herbal; tablets/pills	250-500mg t.i.d.
Vishatinduka vati	Herbal; tablets/pills	125-250mg t.i.d.
Rasnasaptak kwatha	Herbal; Decoction	10-20ml b.i.d.
Ajmodadi churna	Herbal; powder	2-4gm b.i.d.
Khandashunthyavaleha	Herbal; Electuary	4-5gm o.d.
Bhallatak ksheerpak	Herbal, milk processed	1.5-6gm (incremental)

Table 4 : Classical Ayurvedic formulations commonly used for 'Sandhigata vata'

Name of formulation	Nature of formulation	Avg dose/day
Gokshuradi Guggulu	Herbal, tablets/pills	250mg- 1gm t.i.d.
Nirgundi tail	Herbal, local application	As per area
Dashamoola kwath	Herbal, decoction	10-20ml b.i.d.
Ashwagandha choorna	Herbal, powder	2.5-5gm b.i.d.
Chandraprabha vati	Herbo-mineral, tablets/pills	250mg b.i.d./t.i.d.
Dashanga lepa	Herbal, local application	As per area
Trayodashanga Guggulu	Herbal, tablets/pills	250mg-1gm t.i.d.
Bhallatakasav	Herbal, Decoction	10-20ml b.i.d.
Abha Guggulu	Herbal, tablets/pills	250-750mg t.i.d.
Mahavatavidhvansa	Herbo-mineral, tablet/pills	125-250mg b.i.d./t.i.d
Mahayograj Guggulu	Herbo-mineral; Pills/tablets	125-250mg b.i.d./t.i.d

Basti

Rectal administration of drugs (*basti*) is an important Ayurvedic therapy in rheumatologic diseases. *Basti*, one of the *Panchakama* therapies, is particularly useful in *Vata*-disorders. Two main types of *basti*, *nirooha* (evacuation) and *anuwasana* (retention of oils prepared with plants), are used in inflammatory and non-inflammatory arthritis respectively. They may be used in various combinations using different herbs according to *dosha*-dominance. Rectal drug delivery is faster acting as it avoids pH variations of gastrointestinal tract and bypasses enterohepatic circulation.

OTHER INDIAN SYSTEMS

Unani Medicine

Unani (Greek: Ionian; called as *hikmat*) Medicine, supposed to be originated from Hippocrates, is based on theory of four elements (air, water, fire and earth) in Universe and four humors (blood, phlegm, yellow bile and black bile) in the body. Temperament (*mizaj*) of one individual differs from another due to qualitative differences of humors (hot/cold, moist/dry). *Medicatrix naturae* (power of self preservation, *Quwwat-e-Mudabbira*) maintains humoral balance and diseases are caused by their imbalance. Therapy is directed to regain this *Medicatrix naturae*. Regimental therapy (*Ilaj bit tadbeer* including *Hajamat*-cupping, massage, cauterization, etc.), diet and drugs (90% herbal) are used in treatment of medical conditions. With its largest manpower and infrastructure, India is the world leader of Unani Medicine. Due to turbulent conditions in ancient Egypt and Mesopotamia, *hikmat* was evolved mainly in India and adjoining countries. Many Ayurvedic drugs, therefore, find place in Unani medicine. Guggulu, Ashwagandha, ginger and turmeric are included in Unani pharmacopia. National formulary of Unani Medicines includes 7 drugs for use in joint disorders including RA, gout and sciatica (jograj gugal, garlic, nux vomica, colchicum, etc). Clinical trial of unim-301 (coded drug) along with drug-fomentation and oil has shown promising results in a large number of cases of arthritis (*Waja ul Mafasil*) including RA although further scientific validation is necessary. A small study (n=20) showed encouraging results of cupping in RA¹⁹.

Siddha Medicine

Siddha medicine²⁰ is another ancient system of Dravidian origin prevalent in Tamil speaking parts of India. It is believed to be originated from

Agasthiyar, one of the 18 Siddhars (wise men) with divine powers. The Varma branch of Siddha medicine, based on 100 vital body points, deals with traumatology. The principles of this system, both fundamental and applied, appear to be similar to those in Ayurveda.

The classification of majority of diseases is based on clinical symptoms or disequilibrium of humors (*Doshas*). Use of metals and minerals is predominant in Siddha therapeutics though herbal and animal products are also used. The mystic alchemy of Siddha system classifies metals and minerals according to their properties. Elaborate processing of these minerals with herbs, use of *muppu* (a natural salt) and use of proper adjunct with the drug are some of the peculiarities.

Despite growing global concern about metal content of drugs, Siddha system claims to offer remedies for a variety of chronic diseases including articular and spinal disorders. Clinical therapeutic trials have been performed on drugs like Gauri Chintamani, Lingachendooram, Vettumaran gutika compound and Amukkara choornam compound in RA.

HOMEOPATHY

Founded by Dr. Samuel Hahnemann (Germany) in 1790s homeopathy has significant presence in India. The first homeopathic medical college was founded at Kolkata in 1881. Arthritis stands 9th amongst 10 most common conditions treated by homeopaths²¹.

Homeopathy believes that disease is intimately associated with life of an individual and is a result of internal concealed causes. Illness occurs only when resistance within the body is disturbed. The entire individual person rather than organ systems needs to be treated for effective cure. Effects of drugs on various healthy individuals (Proving) are recorded in *Materia-Medica* (Repertory). A patient is accurately assessed on the basis of all symptoms including psychological and matched with similar picture in *Materia-Medica*. Finding the right remedy is a challenge to the practitioner. Drugs are then used on the principle of 'like cures like'. The goal is to provoke vital force within the body so that it will elevate body systems to a higher level and eliminate disease. Therapy thus differs amongst patients of same conventional diagnosis in classical homeopathy. Avoidance of 'antidotes' such as coffee, mint, camphor, acupuncture, etc. is also important. Concurrent use of modern drugs is usually discouraged on the basis of antidoting.

Remedies prescribed for a particular ailment without detailed assessment of individual patient is called as 'nonclassical' homeopathy. Combination drugs are also available for ailments such as arthritis pain. Bryonia, Apis, Pustallia, Rhux-tox, Kali-Carb, Colchicum, Ledam Pal and Nat Mur are important drugs used in arthritis.

Although homeopathy claims success in treatment of autoimmune disorders, it is not generally advised in long standing arthritis with damaged cartilage. Clinical studies are difficult due to individualization of treatment in classical homeopathy and challenges in selection of drugs for an individual patient. A double-blind prospective study of classical homeopathy treatment in rheumatoid arthritis showed significant improvement than placebo controls over 3 month period. Reduction in tender points and improved relief of pain were noted in a study of fibromyalgia. In a meta-analysis of 186 double-blind and/or randomized placebo controlled clinical studies 89 out of 119 studies meeting inclusion criteria showed combined odds ratio of 2.45 (95%CI, 2.05-2.93) in favor of homeopathy²². All 4 studies in rheumatoid arthritis favored homeopathy over placebo whereas one study in osteoarthritis did not.

NATURE CURE THERAPIES

Naturopathy is a drug free, noninvasive system of primary health care based on theory of self healing capacity of the body and principles of prevention of diseases by way of natural methods and healthy living. While treating the whole person including physical, psychological and social factors, the physician allocates more time towards patient education. A good doctor-patient relationship, thus, is of immense value in this eclectic form of therapy. Naturopaths are expected to have basic scientific knowledge of prevention and treatment of diseases. This is probably not true in India. Based on common philosophy and principles of naturopathy, an individual practitioner can use a single form of intervention or a combination of various modalities such as diet therapy, mind-body medicine (meditation, hypnosis, etc), hydrotherapy, physical therapy, herbal medicine as well as Ayurveda, homeopathy, Chinese medicine and acupuncture.

Manual and manipulation techniques such as massage therapy, osteopathic medicine, and chiropractic (Greek: done by hand) are widely practiced in India for various rheumatologic conditions. Manual techniques appear to be

beneficial for back and neck pain when compared with no treatment or placebo. Studies have shown mixed results in several conditions such as carpal tunnel syndrome, osteoarthritis, fibromyalgia, ankylosing spondylitis and diffuse idiopathic skeletal hyperostosis²³.

Yoga

Yoga (Sanskrit: union, of body, mind and soul; 'to be one with divine') is one of the six great philosophies of India. Ayurveda has included Yoga as a part of ideal life style. Yoga has very wide and comprehensive potential for development of physical, mental and social health. Yoga needs to be practiced in 8 stages (Ashtang Yoga: eight-fold path) one after another for all round development of personality (Table 5). Yoga can, therefore, be classified as mind-body medicine.

Table 5 : Eight-fold path of Yoga

1) Yama	Self-restraint, moral attitudes towards society
2) Niyama	Self regimen, good individual observances
3) Asana	Yogic postures
4) Pranayama	Control of breathing and thoughts
5) Pratyahar	Conscious withdrawal from senses
6) Dharana	Self absorption (concentration)
7) Dhyana	Meditation
8) Samadhi	Trans

Various methods of Yoga having common ultimate goal of *Samadhi*, are broadly classified into 4 streams viz. *Karmayoga* (work, service), *Bhaktiyoga* (devotion, worship), *Jnanayoga* (philosophy, wisdom) and *Rajayoga* (mind control, meditation). *Hathayoga* (*Ha*: sun, *Tha*: moon; balance of two qualities) is a part of *Rajayoga* and controls mind through *Asana*, *Pranayama*, *Mudra* (voluntary action) and *Bandh* (voluntary action to generate positive pressure). Yoga also undertakes cleansing techniques (similar to Panchakarma in Ayurveda) without use of any drugs.

A typical Yoga session (usually one hour) consists of warm up exercises (*Surya Namaskar*) followed by 8-10 *Asanas* with intermittent rest, *Pranayama*, meditation and *Aum* recitation one after another. Proper breathing techniques are emphasized throughout the session. Ideally, Yoga needs to be practiced everyday as a way of life and a good teacher is required at least for initial training.

Most Asanas have a dynamic (assumption of posture and coming back) and static (maintenance of posture for a length of time) component. Asanas are not mere stretching exercises as heart rate should not increase by more than 6% over resting baseline in an ideal posture. Asana is an effortless assumption of a stable and comfortable posture as well as mind without any unpleasant sensation of pain. Most of the Asanas are corrective in nature and are useful in reconditioning of the musculoskeletal system by slow and smooth movements. Other Asanas are for relaxation (e.g. *Shavasana*) or meditation (e.g. *Padmasana*).

Yoga is advised for various musculoskeletal disorders. International Association of Yoga Therapists (www.iaiyt.org) also advocates Yoga for arthritis and allied conditions. Yoga and Tai-chi (Chinese counterpart of Yoga combining deep breathing and relaxation with slow and gentle movements, both isometric and isotonic, while maintaining good posture) sessions form a part of training programs for lupus patients.

Mechanical actions of Yoga, such as changes in cell shape due to mechanical and fluid pressure, can have physiologic effects at cellular level and might alter joint function²⁴. A review of research found that mind-body techniques, including Yoga, are helpful in treating musculoskeletal disorders²⁵. Pain, tenderness and finger range of motion improved significantly in patients of hand osteoarthritis after 8 week Yoga program²⁶. Patients of knee osteoarthritis also showed significant improvement in WOMAC pain, WOMAC physical function and other indices after 8 week Yoga program²⁷. Another pilot study in chronic low back pain also reported encouraging results²⁸. Yoga has beneficial effects in stress, anxiety and depression. This automatically helps improvement in quality of life for most of the patients with rheumatologic disorders.

Another review found weak or contradictory evidence on benefits of Yoga and Tai chi in osteoarthritis²⁹. Although no adverse events are reported due to Yoga practices, incorrectly performed Asanas can cause problems in several ways. Some of the Asanas such as *Padmasana* or *Vajrasana* (extreme knee flexion), can be difficult to perform and may actually be deleterious in cases of knee osteoarthritis.

Acupuncture

Chinese medicine is based on theories of *yin* (feminine, dark, cold, passive, negative factors) and *yang* (opposite factors- similar to pairs of qualities in Ayurveda) and presence of *chi* (*Chetna* in Ayurveda, Vital force in homeopathy) as physiological basis of living body. *Chi* flows in human body by various pathways called meridians (*Srotasas* in Ayurveda, *Nadi* in Yoga) and symptoms of disease signal problems in the flow of *chi*. Circulation of *chi* within the body is influenced by five elements (similar to Ayurveda except wood and metal in place of *Vayu* and *Akash*) and health is harmonious balanced cyclic interaction of these elements. Diseases result from deficient, excessive or stagnated *chi*. Most of the musculoskeletal disorders are classified as *Bi* (*Vata dosha* in Ayurveda) disorders. The treatment is person-specific rather than disease-oriented and is directed towards normalization of *chi*.

Chinese medicine has many varieties and traditions different from each other. Traditional Chinese Medicine (TCM) uses medicinal herbs supplemented by acupuncture. Acupuncture³⁰ involves insertion of thin, sterile, stainless steel needles into points (on meridians) on the skin up to epidermis. Electrical stimulation or herbal extracts may be applied to these needles. Acupuncture, too, can be of various types such as classical, Japanese, moxibustion (burning of moxa herb on acupoint), laser beam therapy, acupressure-shiatsu (massage techniques, no needles), auricular-wrist-scalp acupuncture, etc.

World Health Organization list of conditions treatable by Chinese medicine and acupuncture includes cervicobrachial syndromes, frozen shoulder, tennis elbow, sciatica, low back pain and osteoarthritis. NIH consensus panel on acupuncture lists carpal tunnel syndrome, epicondylitis, fibromyalgia and low back pain as conditions in which acupuncture is potentially useful.

Acupuncture trials are difficult to assess because of questionable correctness of acupuncture, problems in blinding and low overall quality. Statistically significant and clinically relevant improvement was seen in all cases of osteoarthritis pain after acupuncture³¹. Sham controlled trials suggest specific effects of acupuncture for pain control in peripheral joint osteoarthritis³². This improvement does not appear to be better than physiotherapy at the end of 12 weeks in cases of severe knee osteoarthritis waiting for knee

replacement³³. Cochrane reviews of acupuncture in chronic low back pain and shoulder pain conclude that acupuncture is effective in these conditions for short term pain relief. A Bandolier review indicates that acupuncture treatment is better than sham treatment in cases of fibromyalgia. The WHO document indicates efficacy of acupuncture in gout too. No statistically significant effects could be found in cases of chronic mechanical neck pain and rheumatoid arthritis.

ACKNOWLEDGEMENT

Each of the above mentioned therapies are science and art by themselves and no single person can master all of them. The authors wish to thank various experts in their respective fields.

Dr. A. B. Vaidya (Research Director, Kasturba Health Society, Mumbai), Dr. G. S. Lavekar (Director, CCRAS), Dr. N Shrikanth (Asst. Director, CCRAS), Dr. K. C. Shah (Homeopathy), Hakim Abdul Malik Asmi (Unani), Dr. P. B. Lohiya (Acupuncture) and Drs. Dattakumar , Vikas Khare, Gayatri Paranjape, Lenu Paulose (technical assistance).

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