

AYURVEDIC MEDICINE AND ARTHRITIS

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The term *Ayurveda*, a Sanskrit word, translates into knowledge (*veda*) of life (*ayur*). Inseparable from the prebiblical roots of the Hindu civilization and religion, the ancient Hindu texts of knowledge (the Vedas, including Ayurveda) and mythology (the great epics) were written in Sanskrit, the most ancient Indian language. Centuries later, these ancient texts are available, although much has been lost to the vicissitudes of time and the changes in human perception and translations. Some of the well-known ancient Ayurvedic texts are the Caraka Samhita (CS, ?BC),¹⁵ Sushruta Samhita (?BC), Ashtanga Hridaya (600 AD), and Madhav Nidan (MN, 700 AD).¹⁸ The chronologic origins of Ayurveda (varies from 1000–6000 BC in the literature), especially with reference to the CS and Sushruta Samhita, are still controversial. The Artharvaveda, dated between 1000 and 1500 BC, contains several references to the Ayurvedic system. Caraka and Sushruta, the forefathers of the system, practiced and taught Ayurveda in the prebiblical era. The CS and MN were both written in verse form. The MN, based on the teachings of the CS, dealt exclusively with diagnosis and classification. The ancient Ayurvedic medicinal system was highly developed, and many have considered it to be the first medicinal system.¹⁶ Sushruta was probably the first doctor to practice and teach surgery.

In recent times, an interest in natural remedies, including Ayurveda, has been reawakened. A recent survey⁶ of 394 Indian patients suffering

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RHEUMATIC DISEASE CLINICS OF NORTH AMERICA

VOLUME 26 • NUMBER 1 • FEBRUARY 2000

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from chronic rheumatic disorders reported that almost 68% of patients sought relief from alternative systems (with the Ayurvedic system being the most popular) for the major duration of their illness.⁶ In half of this group, Ayurveda was coprescribed with modern medicines, and only 32% of patients adhered to pure allopathy.

This author has referred to the English translations of the CS and MN. Key Ayurvedic terms are often provided in parentheses. The author has quoted, whenever relevant, the translation of the Sanskrit verse (V), sometimes with a simplified Ayurvedic explanation. Medicinal plants have been identified by their modern botanical names along with their popular Indian names.

GENERAL AYURVEDIC CONCEPTS AND FUNDAMENTAL PRINCIPLES

Ayurveda is a holistic science that promotes health through an appropriate diet and lifestyle. Exercise and personal hygiene are emphasized. Mental discipline and control as well as adherence to moral and spiritual values are prerequisites for good health. It also promotes the practices of rejuvenation (*rasayana*) in daily life. The science also deals with seemingly disparate subjects such as rebirth, salvation, renunciation, and the soul. The understanding of the *prakriti* of every individual is critical to both health and disease. Although *prakriti* signifies constitution, it also means nature and conceptually unifies all matter. In the hierarchy of cosmic evolution, plants consist of the same basic matter (*panchbootas*) (i.e., earth, water, air, fire, and ether) and derive attributes that subsequently dictate their medicinal and healing properties.

The tridosha theory (tri means three, and *dosha* is equivalent to a biological humor) is the core concept in health and disease. The three *doshas* (i.e., *vata*, *pitta*, and *kapha*) have been made synonymous with wind, bile, and phlegm humors, respectively, but Ayurvedists resent this oversimplified version with parallels to the Greek medicinal system (believed to have originated later and based on four humors).¹⁶ The *vata*, *pitta*, and *kapha* are considered to govern biomotor, metabolic, and preservative (homeostasis) activity, respectively, as the primary physiologic forces. *Vata*, the most powerful force, governs motion and is most relevant to the nervous and musculoskeletal system. Each *dosha* has its own characteristic anatomic, physiologic, and psychological expressions. Although the colon, small intestine, and stomach are considered to be the primary locations of *vata*, *pitta*, and *kapha*, respectively, these three humors are ubiquitous. In each individual, the *prakriti* is decided by the dominant *dosha(s)*. Any imbalance in the equilibrium of the three *doshas* causes disease.

Each individual is composed of seven constituents (*dhatu*s): fluid (called *rasa*, which is plasma-like and sustains all other tissues), blood, muscle and flesh, bone, marrow, fat, and semen or ova. Rasayana, an essential Ayurvedic system component, aims to strengthen *rasa*. Fluids and life forces (*prana*) travel through channels (*srotas*) that connect tissues.

GENERAL CONCEPT OF DISEASE, DIAGNOSIS, AND THERAPY

The tridosha theory is described in the previous section. The Ayurvedic treatment is highly individualized, because the ancients believed that no two individuals are alike even when they suffer from similar disease. Great emphasis has been placed on the diagnosis (*nidan*), which is based on detailed history taking, clinical examination, and, importantly, the conclusions regarding the deranged *doshas* and *prakriti* of the individual. Deviations in diet and behavior pattern from Ayurvedic norms also are evaluated for targeting therapy. The factors that caused the disease are ascertained and classified as inherent (*samavayi*), noninherent (*asamavayi*), or initiating and instrumental (*nimitta*).

Ayurveda essentially aims to “cure” (*aturasya vyadhi parimokshah*) but accepts limitations as described later. Although the therapy is aimed at the person as a whole, the deranged *dosha* and symptoms are treated vigorously unlike the disease as perceived by the modern medicine. The *dosha*'s equilibrium must be restored (“soil is more important than the seed” concept), even when dealing with infections and trauma. The offending *dosha*(s) must either be reduced (*karshana*) or strengthened (*brimhana*); the weakened human organ or system is strengthened based on the principle of “similar” (i.e., “bone for bone”), for example, using formulations containing powdered animal bones for the skeletal system.

Major modalities of therapy, including the *panchkarma* processes used in numerous chronic difficult to treat ailments, are described below with special reference to arthritis.

ARTHRITIS AND RHEUMATISM

In the Indian community, rheumatic disorders are often loosely described as *vat* (in a different context from *vata*, or the humor), and arthritis is addressed as *sandhivat* (*sandhi*, or joint). It is interesting, if not intriguing, that arthritis should be included in the text (Chapter 28 of the CS and Chapter 22 of the MN) that deal extensively with the nervous system disorders.

In Chapter 28 of CS, it is stated that “if excess *vata* [one of the three *doshas*, or humors] is vitiated all over the body, there is quivering and breaking pain in limbs and joints, as if cracking,” (V 26) but “if it is localized in the joint[,] it produces swelling that feels like an air filled bladder and produces pain on movement” (V 37); this description is suggestive of an inflammatory arthritis. In the MN (Chapter 22), however, it is stated that “*vata* if localized in the joints causes loss of function, pain and crackling sounds” (V 21); this is likely to be a degenerative disorder rather than neuropathic arthritis. The latter chapter also describes sciatica (*gridharsi*), with pain radiating from the lumbar region into the feet. The following verse (V 57) provides a lucid description of a nerve root pain, or radiculopathy, in the upper limbs. There is no direct reference to the vertebral column apparatus in this chapter or in the descriptions elsewhere; however, a condition of stiffened hands, feet, head, back, and hip, with a “stick-like back” that is incurable, is also described (CS, V 51); but the preceding verses describe seizure. The CS also describes a painful swollen knee that begins to look like the “head of a fox” (*kroshtuka-shirsh*) because of the “combined vitiation of *vata* and blood” (*rakta*); nothing else is mentioned, but Ayurvedic doctors consider this form to be either tuberculosis or pyogenic arthritis. Descriptions of a painful and wasted shoulder joint (*amsa sosa*) and shoulder-hand syndrome (*apabahuka*) are also provided. Heel pain caused by improper placing of the feet on the ground while walking (*vata kantaka*) and burning sensations in the soles of the feet (perhaps burning feet syndrome, or *padadaha*) also are described. In another verse (CS, Chapter 28, V 15), a primary condition of dry, cracked, thinned, discolored, and stretched skin with prickling pain and loss of sensation as well as painful joints has been described, which sounds like scleroderma or Raynaud’s disease. Later (V 18), it is stated that “if bone and marrow is the site of excess *vata*[,] the patient has splitting pain in the bones and joints with loss of muscular strength, sleep and generalized body aches and pains”; this is quite akin to osteomalacia or metabolic bone disease.

Vatsonita (CS, Chapter 29), *vatarakta* (MN, Chapter 23), and *amavata* (MN, Chapter 25) have been described as painful forms of arthritis. Although all are characterized by articular swelling, they appear to differ somewhat in the pattern of arthritis, constitutional complaints, and systemic features. *Vatsonita* and *vatarakta* probably refer to the same disease and have been likened “to that of fire and wind” in the CS; although it affects multiple joints, it usually confirms its roots in the hands and feet (V 12–15). The latter picture is quite similar to rheumatoid arthritis (RA), but with succeeding verses, the picture becomes muddled and takes on hues of a gout-like condition. Ayurvedists believe that *vatarakta*, as described in the MN, resembles gout. In the MN (but not

in the CS), it is stated that in *vatarakta*, “there is overcooking in blood, and it is this bad blood that accumulates in the legs” (perhaps a catabolic state or hyperuricemia). In the CS, it is stated that “if all *doshas* are predominant,” additional symptoms or features may be seen in *vatason-ita* and *vatarakta* such as dilatation of blood vessels, contractures or crookedness of fingers and other joints, stiffness, and aversion to cold (V 24–29). Some of the complications (V 31–34) that make the latter disease incurable are also stated to be mental confusion, dyspnea, gangrene, stiffness in the head, fainting, fever, hiccups, trembling, skin inflammation, crooked fingers, blisters, and swellings (perhaps nodules or tophi).

The condition of *Amavata* (MN, Chapter 25, but not described in the CS), described as dreadful, is characterized by painful swollen joints. It produces “weakness and heaviness of the heart (V 4–5) and simultaneously affect[s] the joints.” The disease is said to become incurable when multiple joints are affected and the swellings (of joints) begin to shift from place to place with severe pain resembling that of a scorpion sting. No other features are described. Modern Ayurvedic physicians believe *Amavata* to be synonymous with RA, but the description could well that be that of rheumatic fever arthritis.

Disease caused by one *dosha* is considered to be curable, although that caused by two or three *doshas* is only controllable (difficult to treat, or *krichrasadhya*) and incurable (*asadhya*), respectively.

PATHOGENESIS (AYURVEDIC) OF ARTHRITIS

With reference to the joint, *vata*, *pitta*, and *kapha* relate to the process of motion, metabolic, and secretory functions (synovial fluid), and lubrication and preservation (perhaps of structure and homeostasis), respectively. The *vata dosha* plays a critical role in causing arthritis.

The pathogenesis of *Amavata* and similar arthritic disorders has been further explained by the *ama* hypothesis. Simply defined, the hypothesis attributes the affliction of the joints to the excess accumulation of a vicious substance called *ama* (not isolated or characterized by modern chemistry to date) that is produced in the gut as a result of “weakened” digestion and metabolism (*agni*), food indiscretions, and disturbed *tri-dosha* equilibrium. The *ama*, sometimes with the *vata dosha*, while spreading along *srotas* (channels connecting organs but not defined anatomically), vitiates them and causes obstruction, leading to numerous diseases, including arthritis. The ancient Ayurveda linked arthritis with the gut; it is fascinating that modern medicinal science should authenticate that link in several forms of seronegative spondyloarthritis and postinfective and reactive arthritides.

Dietary indiscretions appear to be the major etiologic factor; some foods causing *vatarakta* (perhaps because of similarities to gout) are leguminous and leafy vegetables, alcohol (*sura*), animal flesh (aquatic and marshy). It is also stated that "delicate persons who eat delicious things at pleasure and are not in the habit of walking may suffer from *vatarakta*" (CS, Chapter 29, V 9). Psychological stresses (especially anger, grief, and worry), trauma, prolonged and undue physical exertion, and sexual intercourse (perhaps because of sexually acquired infections) are other etiologic factors.

ANTIRHEUMATIC THERAPIES

An overview of the current treatment is provided along with some of its ancient links (and logic). Some of the orthodox therapies in practice today remain quite unchanged; besides being complex and time-consuming, they are difficult to standardize and cumbersome to administer. Treatment usually begins with the two basic processes: *svedna* (sweating, heating) and *snehana* (lubrication). Although measures such as diaphoretics and steam baths may be used to execute the former, oily preparations are administered orally or through medicated enemas (*basti*) and massages. The latter aim at cleansing and purifying the body and begin to restore the *tridoshas'* equilibrium. The drugs are administered to patients through multiple routes concurrently or sequentially; the *panchkarma* (translates into five processes) doctrine describes treatment by emetics (*vaman*), purgatives (*virechana*), oily enema (*anuvasana*), dry enema (*niruhana*), and oleation and nasal purgation (*shirovirechana*). The *panchkarma* is considered to be curative to the offending *dosha(s)*. Extracts of antiarthritic medicinal plants (e.g., *Ricinis communis* and castor oil seeds) are often added to the drug vehicle (often oils, butter, curds, or milk). Guided by the therapeutic response, the various procedures described above often are repeated cyclically.

Most antiarthritic plants and drugs in current use are described in the CS. All medicinal plants are classified according to their attributes (taste, *dhatu*s [matter], potency, post-digestive effect, dominant effect on *doshas*). They are used singularly or in combination (sometimes with minerals and other constituents derived from animal sources). Herbal preparations are administered orally as powders (*churanas*), decoctions (*kadas*), and tablets, as well as medicated enemas and other applications described below. Some of the ancient oral plant-based multicomponent drugs (e.g., *dashamula*, *triphala*, *cyavanaprasa*) are still popular. Plant and tree gum resins called *gugullu*,¹⁴ (e.g., *Commiphora mukul*, *Boswellia serrata*) have been used invariably in all forms of arthritis since ancient times. Antiarthritic plants generally improve digestion, digest *ama*, or correct

the offending *dosha* (e.g., *Emblica officinialis* [amlaki], *Zingiberis officinale* [adrak, or ginger], *Circuma longa* (circumin,⁷ *Tinospora cordifolia* [auduchi], *Allium sativus* [garlic], *Pluchea lanceolata* [rasna], *Asparagus racemosus* [shatavari]¹⁷ *Terminalie chebula* [haritaki]). The formulations also contain extracts from tree bark, vegetables, spices, pulses, and cereals. The animal sources for preparing certain plant-based formulations described in the CS include the bones and flesh of goat, fish, and pecking birds, but such formulations find less use currently. Preparations made from the “meat of aquatic, snatching and marshy animals, and mixed with herbal-mineral drugs and oily uncating substances are used as poultice to alleviate the stiffness, pain, swelling, and immobility of body parts” (CS, Chapter 29, V 124–155). Certain complex preparations like massage oils (e.g., *balataila* in CS, Chapter 28, V 142–156) contain more than 50 ingredients, which are mostly herbal. Plants that promote positive health (described in Ayurveda under *rasayana*) are also used (CS, Chapter 28, V 241). Most of the plants mentioned above (including *antiamavata*) have rasayanic properties, but the prime example is that of *Withania somnifera* (*aswagandha*), which has often been compared with the Chinese plant ginseng and has been studied extensively.^{1, 3, 11, 17, 22}

The antiarthritic minerals (e.g., gold, iron, zinc), which are usually administered mixed with herbs, are prepared as an “ash” through a complex oxidation processes. The process is believed to convert the metal into a nontoxic form while retaining its healing properties.

Dietary restrictions form the mainstay of treatment, and physical exercises and yoga are advocated at the appropriate stage of recovery. Some patients of *Raktavata* and *Amavata* are often made to fast (*langhana*) in the initial stages of acute arthritis so that the body can strengthen its digestive and metabolic systems to combat the accumulated *ama*. Similarly, some patients are offered a special easily digestible diet.

In addition, blood-letting (perhaps to remove excess *dosha*) to relieve pain and swelling by the application of leaches, bleeding, and venesection has been advocated in inflammatory arthritis (detailed method is described in the CS, Chapter 29, V 35–40) but is not in common practice today.

The pain in arthritis is considered to have a multifaceted dimension, and its relief is given prime importance. It is stated in the CS (Chapter 29, V 124), and still practiced widely today, that milk boiled with *dashamula* (prepared from root extracts of 10 medicinal plants) removes pain immediately. The neuropsychological factors have been described in the ancient literature, and some fascinating healing methods have been advocated, for example, “the patient lying on a bed moistened with dews of moonrays covered with flax and lotus leaves and fanned with breeze cooled by contact of sandy beach should be attended by beloved and sweet spoken women with their breasts and hands pasted with sandal

and with cold and pleasing touch who remove burning sensation, pain and exhaustion" (CS, Chapter 29, V 129). Of course, during his search, this author could not come across any Ayurvedic center or hospital where such a healing method is in practice today.

RASAYANA AND ARTHRITIS

As summed up in the ancient CS and Sushrita Samhita texts, the aims of *rasayana* are to increase the body's resistance to disease (*vyadhi-kshamatva*, which is akin to immunity), increase the life span and delay aging, and promote intellect and strength. The science of *rasayana* and its plants have been the focus of research in the modern context of immunomodulation and arthritis.^{3, 19} Numerous Indian workers from Ayurveda and modern phytopharmacology have been engaged in testing ancient *rasayana* plants for potent antimicrobial, anticancer, and immunomodulation effects. The *rasayana* concept has been translated into a hypothesis that rasayanic plants cause nonspecific strengthening of immunoresponsiveness to antigenic challenge in promoting positive health. In addition to the plants mentioned previously, *Boerrhavia diffusa* (*punaranava*), *Centelle asiatica* (*madukaparni*), *Crotalaria pluricaulis* (*shankapushpi*), *Semecarpus anacardium* (*bhallatak*), *Azadiracta indica* (neem tree), *Vitex negundo* (*nirgundi*), *Ocimum sanctum* (*tulasi*), *Piper longum* (*pippali*), and *Aloe vera* (*ghritkumari*), are known for their rasayanic properties (also described in the CS).

VALIDATION

The ancient Ayurveda emphasized repeated observations (*bhuyo darshana*) and acceptance of data as reliable only if of uniform consistency (*anvaya*) without any contradictions (*vyatireka*); thus, they laid the foundation of a validation process. In recent times, several antiarthritic plants have been tested for their anti-inflammatory and other relevant biological effects in laboratory. Such testing has included experiments in animal models. A detailed bibliography of such tests is beyond the scope of this article; however, their clinical efficacy and safety have been sparsely documented by controlled clinical drug studies.

A 12-week clinical trial study¹² using a randomized, placebo-controlled, crossover design reported efficacy of a multiple plant-based formulation (*W. somnifera*, *B. serrata*, *C. longa*, and zinc ash) in 20 patients with RA; in comparison with the placebo group, significant improvement was reported in several efficacy measures in the active group, and seroconversion of rheumatoid factor from positive to negative was reported in several patients.

In a recent study by this author,⁴ 182 patients with active RA were recruited into a 16-week randomized, double-blind, placebo-controlled

drug trial followed by an open-label phase to test the efficacy and safety of RA-1 (a standardized four-plants-based drug of Ayurvedic origin). Concurrent use of nonsteroidal anti-inflammatory drugs (NSAIDs) and disease modifying anti-rheumatic drugs (DMARDs) was not allowed, but 76 patients on a fixed daily dose of prednisone (mean dose of 5.1 mg) were enrolled. Paracetamol was allowed as the rescue analgesic. An intention-to-treat analysis showed significant ($P < 0.05$) improvement in the active group with respect to the proportion of patients with a 50% reduction in joint swelling, a fall in rheumatoid factor titer, and increased hemoglobin. Although the difference was statistically insignificant, the active group performed better than the placebo group in all other measures; however, the placebo response was remarkably high. The frequency of side effects (otherwise reported as mild and brief) did not statistically differ between the groups. A continuous improvement ($P < 0.001$) in several American College of Rheumatology core set measures⁹ and laboratory activity indices (erythrocyte sedimentation rate, C-reactive protein (CRP), interleukin-6) was seen during the open-label phase. It was concluded that RA-1 was a promising, effective, and safe drug in the management of RA and that its role was more that of a DMARD, than an NSAID.

In a further study on RA-11,⁵ an augmented form of RA-1 mentioned earlier, 90 patients with symptomatic (pain visual analog scale (VAS) > 4 cm) primary osteoarthritis of the knee joints were randomized into active ($N = 45$) and placebo groups ($N = 45$) to enter a 32-week randomized, double-blind, placebo-controlled drug trial study based on the hypothesis that similar plant-based medications are used in Ayurveda to treat different forms of arthritis. No pain medications were permitted. A functional assessment questionnaire, the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC),² was validated for Indian patients and used to measure pain, stiffness, and difficulty. The results showed a significant reduction in pain on VAS ($P = 0.006$) and an improvement in WOMAC score for combined ($P = 0.044$) and individual ($P = 0.012$ – 0.059) components. None of the patients withdrew because of drug toxicity, and significant side effects were conspicuously absent. A 24-hour urinary cortisol measurement did not differ between the treatment groups ($P = 0.73$), indicating that the action of RA-11 probably did not mediate through “steroid mechanisms.” It was concluded that RA-11 is an effective and safe long-term symptomatic treatment for osteoarthritic knees and that its chondroprotective action, although speculative, merits further testing.

From uncontrolled personal observations and review of a prospective 5-year referral patient database, this author can safely conclude (unpublished) that:

- A significant proportion of patients painstakingly follow supervised Ayurvedic therapy for prolonged periods, sometimes for several years.

