Utilization of Ayurveda in Health Care: An Approach for Prevention, Health Promotion, and Treatment of Disease. Part 2—Ayurveda in Primary Health Care

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ABSTRACT

Ayurveda is a comprehensive natural health care system that originated in India more than 5000 years ago. It is still widely used in India as a system of primary health care, and interest in it is growing worldwide as well. Ayurveda has unique concepts and methodologies to address health care throughout the course of life, from pregnancy and infant care to geriatric disorders. Common spices are utilized, as well as herbs, herbal mixtures, and special preparations known as Rasayanas. Purification procedures known as Panchakarma remove toxins from the physiology. Research has been conducted worldwide on Ayurveda. There are encouraging results for its effectiveness in treating various ailments, including chronic disorders associated with the aging process. Pilot studies presented in this paper were conducted on depression, anxiety, sleep disorders, hypertension, diabetes mellitus, Parkinson’s disease, and Alzheimer’s disease. These preliminary studies yielded positive results and provide a basis for conducting larger, more rigorous clinical trials. Conducting research that compares Ayurveda’s comprehensive treatment approach, Western allopathic treatment, and an integrated approach combining the Ayurvedic and allopathic treatments would shed light on which treatment approach is the most effective for the benefit of the patient.

INTRODUCTION

Ayurveda, the Science of Life, is a comprehensive system of natural health care that originated in India more than 5000 years ago. It is still widely used in India as a system of primary health care. 1 Ayurveda has the knowledge base and methodologies to provide health care throughout the course of life, from the antenatal period to the geriatric stage. It provides simple, cost-effective techniques that do not have the prevalence of toxic side-effects inherent in Western allopathic medicine. There is a large body of research on Ayurveda that has been conducted during the past 100 years. 2 This research shows encouraging results in many areas of health care, especially the management of chronic disorders associated with the aging process. 2–4

AYURVEDA THROUGHOUT THE COURSE OF LIFE

In Ayurveda, many methods are described to promote the health of the pregnant woman in the antenatal and postnatal periods 5 (Gupta 1999*), (Sharma 1981*), (Gupta 1994*). Breast feeding is highly recommended for optimal growth of

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5See Appendix entitled “Research in Theses.”
the baby in the early period of life. The herb *Asparagus racemosus* Willd. (*Shatavari*) promotes lactation in the postnatal period (Ayyagari*6–7, and the herbs *Sida cordifolia* Linn. (Bala), (Rao*8, (Dixit)*8, and *Abutilon indicum* Linn. (Atibala) (Trivedi 1988*), (Srividhane*8) promote growth of the baby.

*Withania somnifera* Dunal (Ashwagandha), (Paul*)9–11 promote growth of the baby in the early period of life. The herb *Asparagus racemosus* (Singh 1995*)12 and *Tinospora cordifolia* (Willd.) (Guduchi)13 are immunity-promoting herbs that can play an important role in primary health care from the standpoint of prevention, health promotion, and treatment of disease. *Withania somnifera* also has adaptogenic, cognition-promoting, antistress, mood-stabilizing, anti-inflammatory, and rejuvenating properties.3,9,14,15 *Ocimum sanctum* Linn. (Tulsi)16 and *Azadirachta indica* (Aegle marmelos) (L. Cor) are immunity-promoting herbs that can play an important role in primary health care from the standpoint of prevention, health promotion, and treatment of disease. *Withania somnifera* also has adaptogenic, cognition-promoting, antistress, mood-stabilizing, anti-inflammatory, and rejuvenating properties.

### TABLE 1. AYURVEDIC HERBS THAT PROMOTE FUNCTIONING OF VARIOUS ORGANS AND SYSTEMS OF THE BODY

<table>
<thead>
<tr>
<th>For promoting immunity2</th>
<th><em>Sida cordifolia</em> Linn. (Bala)(Rao)(Dixit)8 and <em>Abutilon indicum</em> Linn. (Atibala)(Trivedi 1988),(Srividhane)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In childhood</td>
<td><em>Withania somnifera</em> Dunal (Ashwagandha)(Paul)9–11, (Chudasama), (Hejmadi)</td>
</tr>
<tr>
<td>In old age</td>
<td><em>Emblica officinalis</em> Gaertn. (Amalaki)13,98,99</td>
</tr>
<tr>
<td>In all age groups</td>
<td><em>Ocimum sanctum</em> Linn. (Tulsi)16</td>
</tr>
<tr>
<td>For promoting functions of the brain2</td>
<td></td>
</tr>
<tr>
<td><em>Centella asiatica</em> (Linn.) Urban (Mandukaparni)79,102, (Mishra), (Joshi)</td>
<td></td>
</tr>
<tr>
<td><em>Bacopa monnieri</em> (Linn.) Pennell (Bralna)62,103 (Singh 1977), (Singh 1978), (Pathak)</td>
<td></td>
</tr>
<tr>
<td><em>Acorus calamus</em> Linn. (Vacha)64,105, (Doshi), (Jadhav)</td>
<td></td>
</tr>
<tr>
<td><em>Celastus paniculatus</em> Willd. (Jetishmait)77,78, (Doshi), 106</td>
<td></td>
</tr>
<tr>
<td><em>Tinospora cordifolia</em> (Willd.) Miers (Guduchi)80, (Sinha 1975), (Sinha 1981)</td>
<td></td>
</tr>
<tr>
<td>For promoting functions of the heart2,107</td>
<td></td>
</tr>
<tr>
<td><em>Terminalia arjuna</em> Wight &amp; Arn. (Arjuna bark)36,37, (Joshi), 107,108, (Gupta 1971), (Chaturvedi), (Dikshit)</td>
<td></td>
</tr>
<tr>
<td><em>Inula racemosa</em> Hook f. (Pashkarmula)38,39,107,110,111, (Gupta 1982), (Sharma 1984)</td>
<td></td>
</tr>
<tr>
<td><em>Saussurea lappa</em> C.B. Clarke (Kushta)111,112, (Singh 1989), (Shanbag)</td>
<td></td>
</tr>
<tr>
<td>For promoting functions of the respiratory tract2</td>
<td></td>
</tr>
<tr>
<td><em>Cucurna longa</em> Linn. (Turmeric; Haldi; Haridra)42, (Singh 1962)</td>
<td></td>
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<tr>
<td><em>Adhatoda vasica</em> Nees (Vasa)113–116, (Dwivedi)</td>
<td></td>
</tr>
<tr>
<td><em>Glycyrrhiza glabra</em> Linn. (Yasthimadhu)120,121, (Dwivedi), 117</td>
<td></td>
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<tr>
<td><em>Albizia lebbeck</em> (Willd.) Benth. (Shirisha)122, (Agrawal)</td>
<td></td>
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<tr>
<td>For promoting functions of the stomach2</td>
<td></td>
</tr>
<tr>
<td><em>Emblica officinalis</em> Gaertn. (Amalaki)118,119, (Varma)</td>
<td></td>
</tr>
<tr>
<td><em>Eclipta alba</em> Hassk. (Bhringaraja)120, (Gupta 1976), (Triwari)</td>
<td></td>
</tr>
<tr>
<td><em>Asparagus racemosus</em> Willd. (Shatavari)7,120,121, (Batchu), (Maheshwari), (Prasana)</td>
<td></td>
</tr>
<tr>
<td>For promoting functions of the liver2, (Pandey 1975)</td>
<td></td>
</tr>
<tr>
<td><em>Phyllanthus niruri</em> auct. non Linn. (Bhumyamalaki)44, (Vora)</td>
<td></td>
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<tr>
<td><em>Piper longum</em> Linn. (Pippali)122, (Pandey 1976)</td>
<td></td>
</tr>
<tr>
<td><em>Andrographis paniculata</em> (Burm.f.) Nees (Kalmegha)43, (Tomar), (Ramju)</td>
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<tr>
<td><em>Picrorhiza kurroa</em> Royle ex. Benth. (Kutaki)123,124, (Pandey 1966), (Singh 1975)</td>
<td></td>
</tr>
<tr>
<td>For promoting functions of the alimentary canal2</td>
<td></td>
</tr>
<tr>
<td><em>Aegle marmelos</em> (L.) cor. ex Roxb. (Bilva)125, (Verma)</td>
<td></td>
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<tr>
<td><em>Terminalia chebula</em> Retz. (Haritaki)99,126, (Tripathi 1983)</td>
<td></td>
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<tr>
<td><em>Holarrhena antidysenterica</em> (Linn.) Wall. (Kutaja)127,128, (Tewari), (Singh 1981), (Trivedi 1984)</td>
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<tr>
<td>For promoting functions of the pancreas2, 23,129</td>
<td></td>
</tr>
<tr>
<td><em>Cinnamomum tamala</em> Nees &amp; Eberm. (Tejapatra)31,32,69, (Singh 1983)</td>
<td></td>
</tr>
<tr>
<td><em>Eugenia jambolana</em> Lam. (Jambul)130,131, (Badesha), (Kohli), (Upadhyay 1986)</td>
<td></td>
</tr>
<tr>
<td><em>Pterocarpus marsupium</em> Roxb. (Giloy)26,27, (Sridhpati), (Singh 1989), (Adhikari), (Chaurasia), (Pandey 1978), (Pandey 1973), (Singh 1979), (Tripathi 1977)</td>
<td></td>
</tr>
<tr>
<td><em>Momordica charantia</em> Linn. (Karela)28–30, (Sridhpati)</td>
<td></td>
</tr>
<tr>
<td><em>Swertia chirata</em> Buch-Ham (Chirayata)2,33,34, (Bhatia), (Prasad 1999)</td>
<td></td>
</tr>
<tr>
<td>For promoting functions of the urinary system2, 49, (Jain) (Singh 1969)</td>
<td></td>
</tr>
<tr>
<td><em>Boerhavia diffusa</em> Linn. (Punarnava)136,139, (Narin), (Naranayan 1988), (Painuli)</td>
<td></td>
</tr>
<tr>
<td><em>Tribulus terestris</em> Linn. (Gokshura)49,134–136, (Prasad 1998), (Singh 1993), (Upadhyaya)</td>
<td></td>
</tr>
<tr>
<td><em>Crataeva nucula</em> Buch-Ham (Varuna)47–49, (Prasad 1998), (Chopra), (Singh 1973)</td>
<td></td>
</tr>
<tr>
<td>For promoting functions of the reproductive system in men2</td>
<td></td>
</tr>
<tr>
<td><em>Mucuna pruriens</em> (Stickm.) DC. (Kapikacchu)45,46, (Agrawal), (Tripathi 1994)</td>
<td></td>
</tr>
<tr>
<td><em>Withania somnifera</em> Dunal (Ashwagandha)107, (Paul),137, (Poojari)</td>
<td></td>
</tr>
<tr>
<td>For promoting functions of the reproductive system in women2</td>
<td></td>
</tr>
<tr>
<td><em>Asparagus racemosus</em> Willd. (Shatavari)119, (Ayyagari), 6,7,138, (Agarwane)</td>
<td></td>
</tr>
<tr>
<td><em>Saraca indica</em> Linn. (Asoka)139, (Paranj)</td>
<td></td>
</tr>
<tr>
<td><em>Hibiscus rosa-sinensis</em> Linn. (Japapushpam)130, (Michael), (Pandey 1972), (Sinha 1978), 20,21, (Devi), (Pandey 1977), (Dave)</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Superscripted numbers refer to References; names in superscript are in Research in Theses appendix.
A. Juss. (*Neem*) enhance immunity and can be used for strengthening the body against possible infections. This could reduce unnecessary use of antibiotics, which have side-effects and ultimately lower the immunity.

There are Ayurvedic herbs that promote the functioning of various organs and systems of the body (Table 1). These organ-specific herbs can be used for the treatment of disease. Research conducted on these medicinal plants has shown specific action on the various organs. For family planning, the herbs *Hibiscus rosa-sinensis* Linn. (*Japapushpam*), (Michael*), (Pandey 1972*), (Sinha 1978*) have shown promising results.

A large number of Ayurvedic herbs are showing effectiveness in the management of chronic disorders. Before discussing this topic, it is important to note that Ayurveda’s approach to the diagnosis of disease is quite different from that of allopathic medicine. Singh wrote:

The *Caraka Samhita* (*Caraka* 700 BC), the foremost classic text on Ayurveda, states that it is neither possible nor necessary to “name” every disease because every patient is unique in terms of the nature of his or her illness and its precise clinical presentation and thus the needed treatment. Therefore, the label of diagnosis in Ayurveda is not always in terms of the “name” of a disease but is in terms of the nature or the phenomenon of the disease state. This phenomenon is to be depicted in terms of the *Samprāpti* (pathogenesis) of the disease in each patient. In spite of the above dictum, one may find a number of diseases described in Ayurveda by “name,” which can be clinically correlated with certain diseases as known in Western modern medicine. . . ."24

Mishra2 and Athavale25 provide details of the Ayurvedic etiology, pathology, and pathogenesis of various chronic disorders.

<table>
<thead>
<tr>
<th>TABLE 2. EFFECT OF <em>ALLIUM SATIVUM</em> LINN. ON DEPRESSION</th>
<th>Mean score*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom</td>
<td>Before</td>
</tr>
<tr>
<td>Depressed mood</td>
<td>2.23</td>
</tr>
<tr>
<td>Guilt</td>
<td>1.38</td>
</tr>
<tr>
<td>Suicidal tendency</td>
<td>0.53</td>
</tr>
<tr>
<td>Insomnia</td>
<td>1.23</td>
</tr>
<tr>
<td>Work and interest</td>
<td>3.00</td>
</tr>
<tr>
<td>Agitation</td>
<td>1.07</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>1.46</td>
</tr>
<tr>
<td>Genital symptoms</td>
<td>0.38</td>
</tr>
</tbody>
</table>

*The mean score highlights the grading of symptoms based on mild, moderate, and severity of symptom.

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<table>
<thead>
<tr>
<th>TABLE 3. EFFECT OF <em>BRAHMI</em> MIXTURE ON ANXIETY</th>
<th>Mean score*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom</td>
<td>Before</td>
</tr>
<tr>
<td>Anxious mood</td>
<td>2.88</td>
</tr>
<tr>
<td>Tension</td>
<td>1.85</td>
</tr>
<tr>
<td>Depressed mood</td>
<td>2.28</td>
</tr>
<tr>
<td>Insomnia</td>
<td>1.14</td>
</tr>
<tr>
<td>Intellectual (cognitive)</td>
<td>1.43</td>
</tr>
</tbody>
</table>

*The mean score highlights the grading of symptoms based on mild, moderate, and severity of symptom.

Pterocarpus marsupium Roxb. (*Vijayasar*),26–27 M.-mordica charantia Linn. (*Karela*),28–30 Cinnamomum tamala Nees & Ebern. (*Tejapatra*),31,32 and Swertia chirata Buch-Ham (*Chirayata*)33,34 are effective in treating diabetes mellitus. Rauwolfia serpentina Benth. (*Sarpagandha*) treats hypertension.35 Terminalia arjuna Wight & Arn. (*Arjuna*)36,37 and Inula racemosa Hook f. (*Pushkarmula*) are used to treat ischemic heart disease. Albizia lebbeck (Willd.) Benth. (*Sarsharny*),40,41 and Cuminum longa Linn. (*Turmeric; Haldi; Haridra*)32 are used in the treatment of bronchial asthma. Andrographis paniculata (Burm.f.) Nees (*Kalmegha*)43 and Phyllanthus niruri auct. non Linn. (*Bhunyamalaki*)44 are effective in treating infectious hepatitis. Mucuna pruriens (Stickm.) DC. (*Kapikacchu*) treats impotency45,46 and Crataeva nurvala Buch-Ham (*Varuna*) is used in treating urinary stones. Withania somnifera,50 Commiphora mukul,51 Boswellia serrata,52 and RA-11, an Ayurvedic drug,53 are effective in treating osteoarthritis.

**ADDITIONAL RESEARCH ON CHRONIC DISORDERS**

There is a large body of research that has been conducted worldwide on Ayurvedic methodologies. Additional research is needed that uses current scientific technologies to further validate the therapeutic efficacy of Ayurveda. In the last several years, India has taken up this challenge.1,2,54,55 The most obvious area of research involves Ayurveda’s extensive materia medica, a rich source of leads for new herbal drugs. India’s Council for Scientific and Industrial Research (CSIR) is actively pursuing this avenue of investigation in collaboration with leading medical institutions in India. Standardized herbal drugs have been developed, or are under development, for the treatment of a variety of chronic diseases.55,56 The Central Council for Research in Ayurveda and Siddha (CCRAS) has an extensive program of research on herbal drugs and has conducted research on Panchakarma therapies.2,57,58 The Indian Council of Medical Research
(ICMR) is actively investigating herbal medicines and other Ayurvedic treatment approaches.26,59

Following is a description of pilot studies carried out at one of the major Ayurvedic universities in India. These studies were conducted on chronic disorders associated with the aging process. The studies produced positive results and can be used as the basis for conducting larger, more rigorous clinical trials.

Depression

Depression is a common disorder found in elderly patients. According to Ayurveda, Allium sativum Linn. (garlic) has intellect-promoting properties that may alleviate depression. In this pilot study, dehydrated powder of garlic was administered to 32 patients with depression (Parikh*). The garlic powder was given at a dose of 1 g (equivalent to 5 g of crude garlic) three times a day for 1 month. Results showed significant relief in seven of eight symptoms tested (Table 2).

Anxiety

Anxiety is a common condition observed during old age due to elevated Vata. Two pilot studies were conducted on Ayurvedic methodologies that are used to treat patients with anxiety (Sharma 1999*). The first study investigated the effects of the Brahmi herbal formulation, which contains Bacopa monnieri (Linn.) Pennell, Asparagus racemosus, Acorus calamus Linn. (Vacha), and Saussurea lappa C.B. Clarke (Kushta). Previous research on Brahmi extracts indicated it has an anxiolytic effect.60–62 For the present study, the Brahmi mixture was administered to 7 patients with anxiety at the dose of 5 g three times a day. The study lasted 2 months, and the Brahmi mixture significantly alleviated all five symptoms tested (Table 3).

The second pilot study investigated the effects of an Ayurvedic nasal therapy known as Nasya. In this treatment, herbal drops are used to cleanse the nasal passages. Nasya is purported to balance the brain and the mind by stimulating the base of the brain via the olfactory nerve endings. In this study, a classical Ayurvedic preparation, called Chaitas Ghrita, was used for Nasya. Chaitas Ghrita contains Operculina turpethum (Linn.) S. Manso, Marsdenia tenacissima (Roxb.) Wight & Arn., Pluchea lanceolata Oliver & Hiern., Cedrus deodara (Roxb.) Loud., Tribulus terrestris, Dashamala (a mixture of 10 roots: Desmodium gangeticum DC., Uruarria picta Desv., Solanum indicum Linn., Solanum xanthocarpum Schrad. & Wendl., Tribulus terrestris, Oroxyllum indicum [Linn.] Vent., Aegle marmelos Corr., Gmelina arborea Linn., Clerodendrum phlomoides Linn., and Stereospermum suaveolens DC.), and cow’s ghee (clarified butter). This study was conducted on 6 patients with anxiety. Chaitas Ghrita was administered at the dose of 16 drops in each nostril for 7 days for the duration of 4 weeks, with a gap of 7 days. Results showed significant relief in all five symptoms measured (Table 4).

Sleep disorders

Sleep disorders are a common occurrence in elderly patients. Research studies were conducted on patients with sleep disorders to investigate the effects of two herbal formulations and the Panchakarma procedure known as Shirodhara, in which a stream of oil was poured on the forehead (Narayan 2000*). One of the herbal formulations was Mamsyadi vati, which contains Nardostachys jatamansi DC., Withania somnifera, Valeriana officinalis DC., and Convolvulus pluricaulis Chois. Previous research showed that an isolated component of Nardostachys jatamansi has a tranquilizing effect,63 and that patients suffering from anxiety slept better when given Convolvulus pluricaulis.64 In the present study, Mamsyadi vati was administered in tablet form at the dose of 1 g twice a day with milk. It was given for 2 months to 20 patients with insomnia. The second herbal mixture was Yashadadi vati, which contains zinc, Achyranthes aspera Linn., Peristrophe bicalylculata Nees, and Boerhavalia diffusa Linn. This was administered in tablet form at the dose of 1 g twice a day with milk for 2 months. Ten (10) patients with insomnia received this herbal mixture. The third group of patients received Shirodhara, using oil containing Withania somnifera (Ashwagandha). Shirodhara was administered to 8 patients for the duration of 15 days. Results showed a significant improvement in the duration

### Table 4. Effect of Chaitas Ghrita Nasya on Anxiety

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Mean score*</th>
<th>Before</th>
<th>After</th>
<th>Percent relief</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxious mood</td>
<td></td>
<td>3.17</td>
<td>1.50</td>
<td>36.82</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Tension</td>
<td></td>
<td>2.17</td>
<td>1.00</td>
<td>53.83</td>
<td>&lt;0.02</td>
</tr>
<tr>
<td>Depressed mood</td>
<td></td>
<td>2.83</td>
<td>1.33</td>
<td>47.05</td>
<td>&lt;0.02</td>
</tr>
<tr>
<td>Insomnia</td>
<td></td>
<td>1.50</td>
<td>0.33</td>
<td>77.93</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Intellectual (cognitive)</td>
<td></td>
<td>1.33</td>
<td>0.50</td>
<td>62.49</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

*The mean score highlights the grading of symptoms based on mild, moderate, and severity of symptom.
of sleep (Table 5), quality of sleep (Table 6), and mood upon awakening (Table 7) with all three therapies. Subsequent research on *Valeriana wallichii*, one of the herbs in *Mamsyadi vati*, showed that flavonoids isolated from it have sleep-enhancing properties.65

**Hypertension**

Hypertension is a common disorder described in Ayurveda as *Raktaaghata* and *Raktavritavata*. In this pilot study, 36 patients with essential hypertension were divided into three groups (Patel48). Group 1 received an herbal formulation containing *Bacopa monnieri*, *Convolulus pluricaulis*, *Withania somnifera*, *Nardostachys jatamansi* DC., and *Hyoscyamus niger* Linn. in equal proportions. Previous research revealed the hypotensive action of *Convolulus pluricaulis*,66 and the prolonged hypotensive effect of a total alkaloid extract of *Withania somnifera*67 and essential oil of *Nardostachys jatamansi*.68 In the present study, group 1 patients were given the herbal mixture at a dose of 9 g per day in 3 divided doses for the duration of 8 weeks. Group 2 received the *Panchakarma* procedure *Shirodhara*, in which a stream of milk was poured on the forehead for 45 minutes. This procedure was done for 21 days. Group 3 received a combined therapy, in which both the herbal formulation and the *Shirodhara* treatment were administered.

Results of this study showed a significant reduction in both systolic and diastolic blood pressure in all three groups (Table 8). Some of the patients improved to such an extent that they were able to minimize the dose of their allopathic antihypertensive drug or even stop it completely. This suggests that the Ayurvedic methods potentiated the therapeutic efficacy of the antihypertensive drug. The Ayurvedic methods may be helpful in avoiding the toxic side-effects of the allopathic drug, since the dosage can be reduced or the drug stopped completely.

In this study, there was significant symptomatic improvement in headache, disturbed sleep, fatigue giddiness, redness of eyes, feeling of tension, and palpitation in all three groups, with a better effect in the group receiving combined therapy. Emotional stress was relieved significantly as measured by a brief psychiatry rating scale.

<table>
<thead>
<tr>
<th>Table 6. Effect of Ayurvedic Therapies on Quality of Sleep</th>
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</thead>
<tbody>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>Mamsyadi vati</td>
</tr>
<tr>
<td>Yashadadi vati</td>
</tr>
<tr>
<td>Shirodhara</td>
</tr>
</tbody>
</table>

aThe mean score highlights the grading of symptoms based on mild, moderate, and severity of symptom.

<table>
<thead>
<tr>
<th>Table 7. Effect of Ayurvedic Therapies on Mood upon Awakening</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean score</strong></td>
</tr>
<tr>
<td>Mamsyadi vati</td>
</tr>
<tr>
<td>Yashadadi vati</td>
</tr>
<tr>
<td>Shirodhara</td>
</tr>
</tbody>
</table>

aThe mean score highlights the grading of symptoms based on mild, moderate, and severity of symptom.

**Diabetes mellitus**

In Ayurveda, the diseases named *Prameha* and *Madhumeha* have descriptions corresponding to diabetes mellitus (Chandola33). Several pilot studies were conducted to evaluate the therapeutic efficacy of single Ayurvedic herbs, as well as polyherbal formulations, in patients with noninsulin-dependent diabetes mellitus (NIDDM), as determined by the glucose tolerance test. The duration of treatment for these studies was 2 months.

In the pilot study on *Swertia chirata* (*Chirayata*), (Bhatia33) a water-soluble extract of the herb was administered to patients in tablet form at a dose of 1 g three times a day before breakfast, lunch, and dinner. Results showed a significant decrease in fasting and postprandial blood-sugar levels (Fig. 1). Subsequent research analyzed methanol extracts of *Swertia chirata* that contain constituents with antidiabetic activities.34

In the pilot study on *Cinnamomum tamala* (Tejapatra), the powdered form of the leaves was administered to patients at a dose of 1–2 teaspoonfuls three times a day, half an hour before breakfast, lunch, and dinner. The specific dose for each patient was determined based on the severity of diabetes. Results showed a significant decrease in fasting and postprandial blood-sugar levels (Fig. 2). The blood-sugar levels were decreased through the stimulation of the release of insulin (Figs. 3 and 4).31,32,69

In the pilot study on *Pterocarpus marsupium* (Vijayasara), a decoction was prepared with 40 g of coarse powder of *Pterocarpus marsupium* and administered in two divided doses before lunch and dinner. Results showed a significant decrease in fasting and postprandial blood-sugar levels (Fig. 5) (Sidhpataki13). This correlates with the results of several multicentered phase II and III clinical trials carried out on *Pterocarpus marsupium*, which showed it to be as effective as tolbutamide in the treatment of NIDDM.26 Subsequent investigation of the butanol subtraction of the alcohol extract of *Pterocarpus marsupium* showed it has significant antidiabetic activity and also corrects diabetes-related metabolic alterations in an animal model.27

A pilot study investigated the effects of administering *Pterocarpus marsupium*, along with *Tinospora cordifolia* (*Guduchi*). Six (6) g of *Tinospora cordifolia* powder was
administered twice a day before lunch and dinner, along with the *Pterocarpus marsupium* decoction from the previously mentioned pilot study. Results showed a significant decrease in fasting and postprandial blood-sugar levels (Fig. 6) (Sidhpataki*). Subsequent investigation revealed that an alcohol extract of *Tinospora cordifolia* has hypoglycemic and hypolipidemic activity.70

A pilot study was conducted on Guduchi Rasayana, which contains *Tinospora cordifolia*, *Pterocarpus marsupium*, and *Momordica charantia*. A previous pilot study showed a significant hypoglycemic effect of an aqueous extract of *Momordica charantia*.28 In the present study, tablets were prepared by giving seven bhavanas of *Momordica charantia* (Karvellaka) juice to powder consisting of 50% *Pterocarpus marsupium* and 50% *Tinospora cordifolia*. Bhavana is an Ayurvedic process that blends a liquid constituent with a powder, paste, or mixture to make a homogeneous substance that can be formed into tablets. The tablet was administered at a dose of 4 g three times a day before breakfast, lunch, and dinner. Results showed a significant decrease in fasting and postprandial blood-sugar levels (Fig. 7) (Sidhpataki*). Subsequent research showed that dried powder of *Momordica charantia* improves diabetic status.30 A methanol extract of *Momordica charantia* normalizes blood glucose, reduces triglycerides and low-density lipoproteins, and increases high-density lipoproteins. Discontinuation of the extract resulted in reversion to a diabetic state.29

The results of the aforementioned pilot studies show that Ayurvedic herbal preparations can produce a significant decrease in fasting and postprandial blood-sugar levels. These antihyperglycemic medicinal herbs may be useful in decreasing the dose of allopathic antidiabetic drugs.

**Parkinson’s disease**

In Ayurveda, the disease named *Kampavata* has a description corresponding to Parkinson’s disease. *Mucuna pruriens* (*Kapikacchu*) contains levodopa in its natural form and research conducted on its use in treating this disease has shown encouraging results. A multicenter, clinical trial on a formulation derived from *Mucuna pruriens* showed it to be effective in treating patients with Parkinson’s disease.71 A smaller study showed significant improvement in patients who underwent *Panchakarma* therapy prior to treatment with an Ayurvedic formulation that contains *Mucuna pruriens*.72 In the present pilot study, the powder of *Mucuna pruriens* was administered at a dose of 6 g three times a day for 45 days to 8 patients with Parkinson’s disease. Significant symptomatic improvement was seen in 9 of 12 symptoms tested (Table 9) (Dhurve). The results of a subsequent double-blind, clinical trial on *Mucuna pruriens* indicates it may have advantages over standard levodopa treatment for the long-term management of Parkinson’s disease.73 Synthetic levodopa treatment has side-effects that occur after several years of use. Under laboratory conditions, *Mucuna pruriens* protected against plasmid DNA and genomic DNA damage caused by synthetic levodopa.74

**Alzheimer’s disease**

It is estimated that 24 million people worldwide have dementia, and it is recognized that Alzheimer’s disease is the

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**Table 8. Effect of Ayurvedic Methodologies on Blood Pressure in Patients with Essential Hypertension**

<table>
<thead>
<tr>
<th>Group</th>
<th>Blood pressure</th>
<th>Before</th>
<th>After</th>
<th>Percent relief</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Systolic</td>
<td>160.20</td>
<td>133.60</td>
<td>16.60</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Diastolic</td>
<td>98.00</td>
<td>86.40</td>
<td>11.60</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>2</td>
<td>Systolic</td>
<td>173.80</td>
<td>132.40</td>
<td>23.82</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Diastolic</td>
<td>104.20</td>
<td>89.80</td>
<td>13.82</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>3</td>
<td>Systolic</td>
<td>163.80</td>
<td>131.40</td>
<td>19.78</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Diastolic</td>
<td>96.60</td>
<td>84.40</td>
<td>12.63</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*FIG. 1. Effect of *Swertia chirata* Buch-Ham (Chirayata) on fasting and postprandial (PP) blood sugar levels in noninsulin-dependent diabetes mellitus.*
main cause of dementia syndrome. In the early stage of dementia, the features observed are: memory impairment, cognitive difficulties that interfere with daily activities, frustration, anxiety, depression, suicidal thoughts, and errors in judgment. In the middle stage, the patient is unable to work, gets easily lost and confused, has impaired language and defects in performing sequential tasks, and is unable to do simple mathematical calculations. The suitable term for dementia in Ayurveda may be Smritibhramsha. The memory is impaired due to being overcome by psychic factors known as Rajas and Tamas.

A pilot study on 14 patients with Alzheimer’s disease investigated the effect of two Ayurvedic herbal preparations and Nasya—Ayurvedic nasal therapy (Shah*). The patients were divided into two groups. Group A received Medhya Rasayana, an herbal mixture that purportedly promotes mental health. This formulation contains Celastrus paniculatus Willd., Convolvulus pluricaulis, Centella asiatica (Linn.) Urban, Mucuna pruriens, Semecarpus anacardium Linn. f., Ocimum sanctum, Tinospora cordifolia, Glycyrrhiza glabra Linn., Asphalatum paniculatum, and zinc. This was administered in tablet form at a dose of 3 g three times a day for 2 months. Group B received Medhya Rasayana and, in addition, were given an antioxidant tablet containing Emblica officinalis Gaertn., Curcuma longa, and Allium sativum, with three bhavanas of carrot juice and Emblica officinalis (Amalaki) juice. The antioxidant tablet was given at a similar dose. The 14 patients under both the groups were also given Vachadi Ghrita Nasya, using oil containing Acorus calamus, Saussurea lappa, and Piper longum at a dose of 16 drops in each nostril for 10 days. Four such courses of 2 months duration, with 7 days between successive courses, were carried out. Results showed symptomatic improvement in both groups, with a decreased number of errors on the Bender Gestalt Motor Visual Test, improvement in scores...
on the Mini Mental Status Questionnaire, and mild improvement in depression based on the Hamilton Rating Scale for Depression.

Ayurveda has a large number of herbs and Rasayanas that are purported to enhance memory and intellect as well as rejuvenate mental faculties.2–4 These are known as Medhya Rasayanas.2 The present study and additional research seem to support this claim for several of the herbs that were used in this pilot study: Celastrus paniculatus,77,78 Centella asiatica,79 Semecarpus anacardium,80 Tinospora cordifolia,80 Ocimum sanctum,81 Glycyrrhiza glabra,82 Emblica officinalis,83 Curcuma longa,84–87 and Allium sativum.88 In view of previous encouraging research results, it would be useful to carry out a large-scale clinical study on Alzheimer’s disease, utilizing Medhya Rasayanas.

CONCLUSIONS

The rising health care costs of Western allopathic medicine and its inability to effectively improve the health of the world’s population89–97 signal the need for a more holistic system of health care to come to the forefront. Ayurveda is a time-tested system of natural health care that comprehensively addresses the patient as a whole. It has been widely used in India as a system of primary health care for thousands of years. Research over the last 100 years has shown encouraging results for Ayurvedic treatment of various ailments, especially chronic disorders.

With regard to the management of diseases, Ayurveda’s comprehensive approach is much more extensive than simply using an herb instead of a pharmaceutical drug. It would be valuable to conduct research on the multistrategy approaches of Ayurvedic treatment. Clinical trials could be carried out in the following manner: one arm of the patient population would receive the comprehensive Ayurvedic treatment, another arm would receive the standard allopathic treatment, and the third arm would receive an integrated approach, using the comprehensive Ayurvedic treatment in ad-

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Mean scorea</th>
<th>Before</th>
<th>After</th>
<th>Percent relief</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tremors</td>
<td>1.63</td>
<td>0.75</td>
<td>53.99</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Rigidity</td>
<td>2.00</td>
<td>1.53</td>
<td>25.00</td>
<td>&lt;0.10</td>
<td></td>
</tr>
<tr>
<td>Gait disorder</td>
<td>1.85</td>
<td>1.00</td>
<td>42.50</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Speech disorder</td>
<td>1.29</td>
<td>0.57</td>
<td>55.81</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>Impaired memory</td>
<td>0.63</td>
<td>1.38</td>
<td>54.34</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>2.00</td>
<td>1.13</td>
<td>43.50</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Pill rolling</td>
<td>2.00</td>
<td>0.87</td>
<td>56.25</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Micrographia</td>
<td>2.00</td>
<td>1.14</td>
<td>43.00</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Rombergism</td>
<td>2.00</td>
<td>1.25</td>
<td>37.50</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>Finger to nose</td>
<td>2.00</td>
<td>1.50</td>
<td>25.00</td>
<td>&lt;0.05</td>
<td></td>
</tr>
<tr>
<td>Glabellar tap</td>
<td>2.00</td>
<td>1.40</td>
<td>30.00</td>
<td>&lt;0.10</td>
<td></td>
</tr>
<tr>
<td>Impairment of upward gaze</td>
<td>2.00</td>
<td>1.40</td>
<td>30.00</td>
<td>&lt;0.10</td>
<td></td>
</tr>
</tbody>
</table>

aThe mean score highlights the grading of symptoms based on mild, moderate, and severity of symptom.
dition to the allopathic treatment. This type of clinical study would reveal which treatment approach is the most effective. The overarching consideration should be what works best for the benefit of the patient.

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APPENDIX: RESEARCH IN THESES


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