

AYURVEDIC HERBAL SUPPLEMENTS AS AN ANTIDOTE TO 9/11 TOXICITY

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An in-treatment web-based survey was conducted in 2005 with 50 New York World Trade Center rescue and recovery workers, volunteers, and area residents and workers who were treated with Ayurvedic herbs for post-9/11 symptoms. The survey documented pretreatment efforts at symptom relief, post-treatment symptom impact, and the context for using the herbal intervention. Herbal treatment was administered and monitored by a private non-profit organization. The nat-

ural detoxification and immune-strengthening program consists of 4 herbal supplements developed by an Ayurvedic physician. A minimum 6-month basic program was recommended, but many participants continued to 1 year and longer. All 50 respondents reported high incidence of alleviation of previously intractable symptoms, chiefly respiratory symptoms, fatigue, and depression. (*Altern Ther Health Med.* 2008;14(1):24-28.)

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The attack on the World Trade Center (WTC) on September 11, 2001, released toxic chemicals into the air. The following were found in repeated air-sample testing in lower Manhattan: asbestos, glass fibers, cement dust, lead, polychlorinated biphenyls, hydrochloric acid, polychlorinated dioxins and furans, organochlorine pesticides, as well as volatile organic compounds, polycyclic aromatic hydrocarbons, and metals. The toxic air from the burning and collapse of the WTC has created a public health problem in New York City.

The September 2006 report of the World Trade Center Worker and Volunteer Medical Screening Program at Mt Sinai School of Medicine was the result of a 5-year assessment of the health of 9442 male and female recovery workers at the WTC site.¹ The study found that a high proportion of those examined became sick as a result of this work and that illnesses have persisted in the years since September 11 in a high proportion of these workers.

Other groups were affected as well. About 100 000 people worked in the area in offices, restaurants, and shops, and about 25 000 lived there.² On September 17, the New York Stock Exchange and many businesses reopened.³ Many residents cleaned their own homes, exposing themselves to WTC dust.^{4,5} They too “developed serious, persistent health problems as a result of the attacks.”^{2(p27)} A special group at increased risk for asbestos-related

illness (20 or more years from now) are the workers engaged in clean-up operations in offices and residential buildings near the site.⁶ Small-business owners returned only days after the attacks and cleaned up their shops and restaurants.³ A survey of more than 2000 individuals who lived within a 1-mile radius of the WTC conducted 8 months after the attacks found that previously healthy individuals had an increased rate of respiratory symptoms and medical care compared to a control population.⁷

This article reports the results of a study of an Ayurvedic herbal treatment developed specifically for the health problems caused by exposure to the toxic chemicals at Ground Zero and in lower Manhattan in the months following the September 11 attack on the World Trade Center. Ayurveda is an ancient system of traditional Indian medicine. It is considered the oldest continuously practiced healthcare system in the world and was originally written in the Vedic texts more than 5000 years ago. The aim in Ayurveda is to integrate and balance the body, mind, and spirit, which is believed to help prevent illness and promote wellness. Ayurveda also has treatments for specific health problems.

The basis of Ayurvedic medicine is 5 primary elements: ether (space), air, fire, water, and earth. These elements congregate in certain patterns in living beings; these patterns are known in Sanskrit as *doshas*, which means organization. “As long as the *doshas* are normal in quantity and quality, they maintain a harmonious psychophysiology.” When they go out of balance, they corrupt the body.^{8(p14)}

The 3 *doshas* are Vata, Pitta, and Kapha. Air and space form Vata, which is the moving force—for example, breath. Fire and water form Pitta, which is concerned with assimilation. Water and earth form Kapha, which is the force of stability. The goal of Ayurvedic medicine is to establish and maintain balance of the

life energies within the individual by bringing the 3 *doshas* into equilibrium.⁹ The Ayurvedic herbal formulas studied here were intentionally formulated to be tridosha, or *dosha*-neutral, meaning that they are effective regardless of the individual's Ayurvedic diagnosis and are meant to address a certain set of symptoms (ie, heavy metal toxicity).

The Ayurvedic herbal formulas for this survey study population were developed by Drs Pankaj Naram and Smita Naram, Ayurvedic practitioners in India who have more than 20 years of experience in successfully treating severe chemical toxicity in factory workers in Bombay. The herbs were distributed by Serving Those Who Serve, Inc (STWS), a small not-for-profit organization created to address some of the needs of those who became ill after September 11. The organization offers the Ayurvedic herbal supplements to a targeted and self-selected population: rescue and recovery workers, volunteers, and local workers and residents. A minimum 6-month basic program is recommended, with many participants extending this period considerably. Expected results include improvement in respiratory function, memory, concentration, depressive symptoms, and ability to sleep; increased stamina; and overall sense of well-being.

Each person in this study was given 4 different formulas of Ayurvedic herbs twice a day. One formula acted on the lungs and respiratory system as an expectorant and bronchodilator and had an anti-inflammatory and antihistaminic effect; the second was for the brain and nervous system and improved the functioning of the central nervous system, reducing anxiety and depression; the third was for the immune system to improve the function of white blood cells; and the fourth was for general detoxification by eliminating heavy metals throughout the body. Each batch of herbal mixtures was tested by Neutron Analytical and Technical Services in Modena, Italy, and met the ISO standards for heavy metals.

There are many human studies looking at the efficacy of Ayurvedic herbs for a variety of illnesses, including osteoporosis,¹⁰ type 2 diabetes,¹¹ liver disease and hepatitis,^{12,13} and cardiovascular disease,¹⁴ but these studies do not address heavy metal toxicity, the condition of this study's target population. An extensive search of the literature found few studies that evaluated Ayurvedic herbs as a treatment for heavy metal toxicity—and those studies consisted only of animal research. For example, the Ayurvedic herb *Bacopa monniera* was found to protect the brain from oxidative damage resulting from aluminum toxicity.¹⁵ A study examining the effect of cystone, a polyherbal Ayurvedic preparation, on the nephrotoxicity and antitumor activity of cisplatin found that cystone protected tumor-bearing mice from cisplatin-induced nephrotoxicity without inhibiting cisplatin's anti-tumor effects.¹⁶ Clearly, there are important human and animal research precedents for examining the effectiveness of Ayurvedic herbal treatments for chemical toxicity.

OBJECTIVE

The objective of this study was to document pretreatment efforts at symptom relief and post-treatment symptom impact of

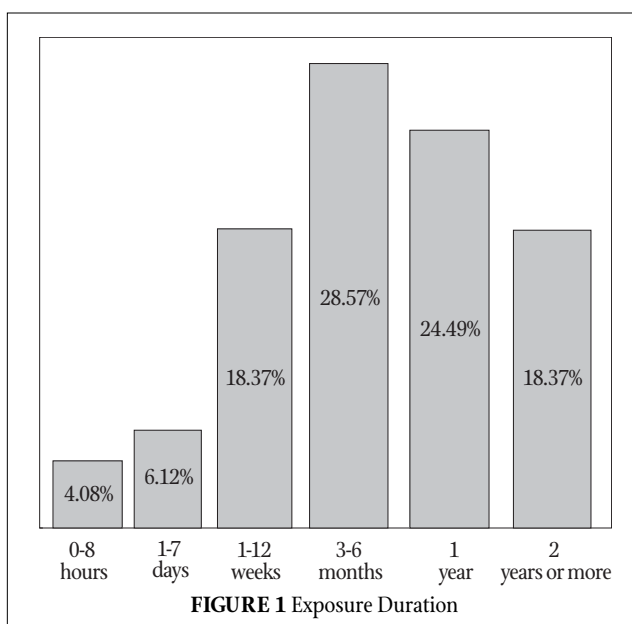
this nontraditional intervention and the context for using the herbal intervention.

METHODS

A total of 80 individuals currently or formerly participating in the STWS Ayurvedic herbal program were contacted by mail or e-mail and asked to complete a novel 33-question survey that was mailed to them and that was also made available on the Internet for completion. This was a comprehensive sample of all current and reachable former participants. Of those contacted, 50 of 80 people (72%) completed the survey.

RESULTS

The mean level of exposure (direct exposure) was 3-6 months, with more than 18% of participants listing exposure of 2 years or more (Figure 1). Fifty-three percent were men, 47% were women, and more than 76% were between 40 and 60 years of age.



Fifty-six percent were volunteers and rescue workers (fire, police, emergency medical services). Sixty-six percent were in the immediate area of Ground Zero, and 22% were in the area from Ground Zero to Canal Street. Respondents reported a wide range of symptoms, with fatigue, exhaustion, and "not feeling well" among the symptoms reported as "extremely serious" on a Likert-type scale of 0-5, with 0 and 1 being minimal and 5, extremely serious (Table). Memory problems, cough, breathing difficulties, concentration problems, and depression were also high among the "extremely serious" symptoms reported. Other symptoms attributed to 9/11 were fear of being (remaining) in New York City, panic attacks, allergies/sinus problems, anxiety, back pain, throat pain, easy rage, and audio hallucinations of sirens.

Nearly 65% of STWS patients received conventional medical treatment for their symptoms, and nearly 44% of that treatment was conventional medication, with 26% receiving psychotherapy

TABLE Patient-reported Ratings of Helpfulness of Conventional Medical Treatment vs Helpfulness of Herbal Treatment of Symptoms of 9/11 Toxicity*

Symptom*	Frequency of Participant Response	Pretreatment Level of Seriousness	Helpfulness of Conventional Medical Treatment	Post-treatment Helpfulness of Herbal Treatment
Cough†	31	4.26	2.95	4.00
Difficulty breathing†	31	3.82	2.95	4.19
Wheezing	24	3.58	2.56	3.54
Chest pain	18	3.07	2.76	3.28
Headaches	21	3.00	2.68	3.43
Fatigue†	31	4.22	2.71	4.10
Exhaustion†	25	3.88	2.47	4.16
Not feeling well†	27	4.08	2.40	4.30
Depression†	28	4.26	3.57	3.71
Memory problems†	32	4.22	2.41	3.88
Concentration problems†	34	4.27	2.47	3.97
Difficulty sleeping†	29	3.90	2.52	4.03
Edema (swelling of body parts)	15	2.33	1.70	2.80
Joint pain	19	3.28	2.22	2.95
Other	20	3.70	2.22	4.05

*All ratings on a 6-point Likert scale of 0-5, from least to most significant.

†Symptoms that were reported by ≥25% of patients.

or counseling and 13% receiving psychiatric medication.

Medications taken for this broad range of symptoms were assessed on a symptom-specific basis. The most frequent medications taken were salmetrol xinaoate, salbutamol, ipratropium bromide and albuterol sulfate, and montelukast for difficulty breathing or asthma (32%); fluticasone propionate, triamcinolone acetonide, mometasone furoate monohydrate, and cefdinir for allergies or sinus problems (29%); citalopram, venlafaxine, clonazepam, and fluoxetine for anxiety or depression (15%); and lansoprazole for acid reflux (12%). Medications that were continued during and after the STWS treatment included asthma medication (33%), allergy medication (19%), anti-anxiety or antidepressant medication (17%), and medication for acid reflux (14%).

Respondents reported a mean level of helpfulness of medical and other conventional treatment in symptom relief of 2.57 for 14 specific symptoms plus a category of "other" on a Likert-type 6-point scale of 0-5, from not helpful to extremely helpful, respectively, indicating a low rating of helpfulness (Figure 2). Those with headaches; fatigue; exhaustion; depression; memory, concentration, and sleep problems; edema; and not feeling well reported the least help with their symptoms from these conventional medical treatments.

In Figure 3, respondent reports of the helpfulness of herbal treatment for these same symptoms show a higher level of treatment satisfaction, especially with not feeling well, difficulty breathing, exhaustion, fatigue, and difficulty sleeping.

Many patients had tried other holistic or non-conventional

medical treatments before they sought out the STWS program. These included acupuncture (20%), chiropractic (16%), energy/spiritual healing (12%), and a combination of other methods (12%).

More than 28% said they sought Ayurvedic herbal treatment because they were frightened about the possible health impact of toxic materials. In addition, 25% reported that they were referred to STWS by someone else, and 23% said they participated because their health had not improved substantially with other treatments.

AYURVEDIC TREATMENT THROUGH SERVING THOSE WHO SERVE

Forty percent of respondents reported taking the STWS treatment for 12 months or more. Twenty-eight percent took it for 90 days to 5 months, and 22% took it for 6-11 months.

Difficulty breathing was the second leading symptom reported for which respondents found the STWS treatment extremely helpful (ranked 4.19 on a 6-point scale from 0-5 and "not feeling well" was the first, ranked 4.3). Cough, wheezing, concentration problems, difficulty sleeping, and other associated problems were each reported as relieved at a very helpful level (ranked 3.57-4.03). The level of helpfulness of conventional medical treatments was rated significantly lower for each symptom than the level of helpfulness of the herbal treatment.

More than 25% of patients experienced no problems taking the herbs, whereas more than 15% reported problems such as nausea and gas in the early stages, and more than 15% reported that the herbs "tasted bad." More than 85% reported experiencing

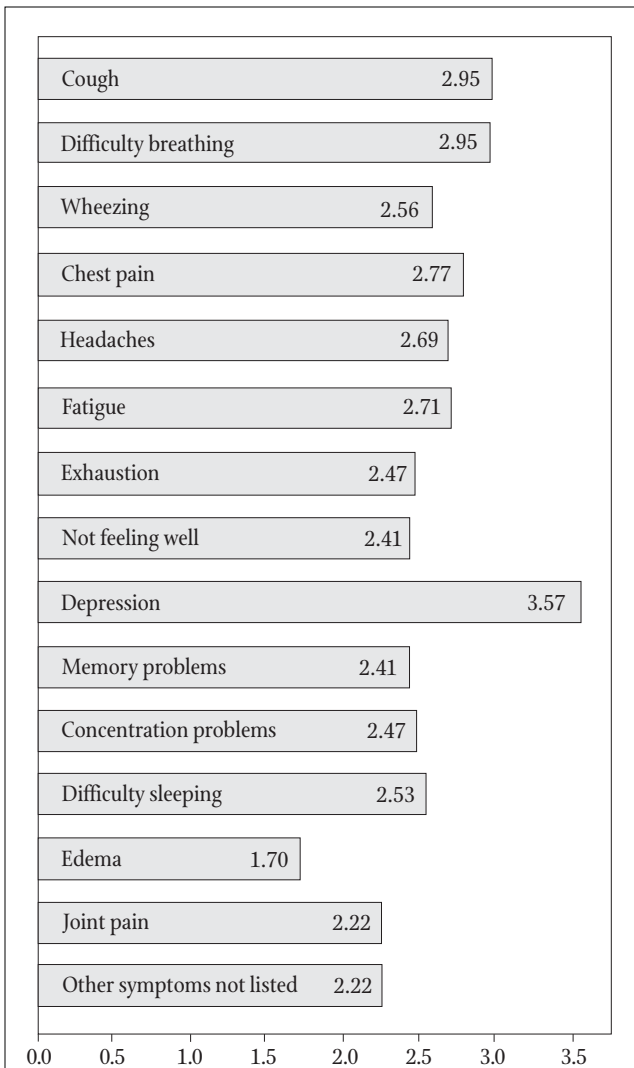


FIGURE 2 Helpfulness of Conventional Medical Treatment for Symptoms

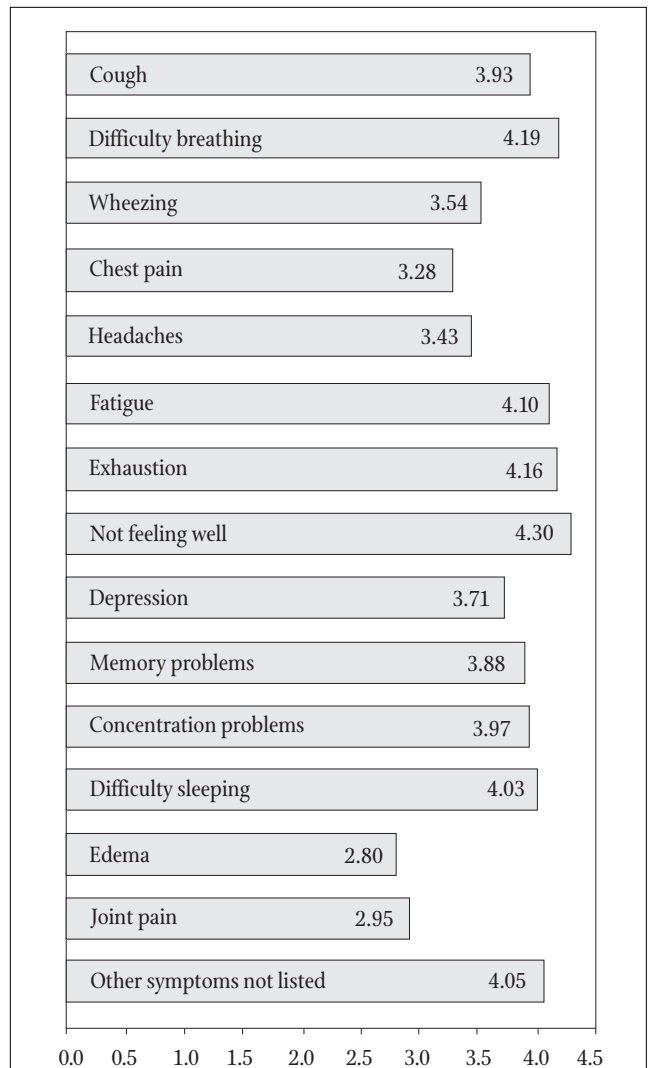


FIGURE 3 Helpfulness of Ayurvedic Herbal Treatment for Symptoms

no long-term negative effects from the STWS treatment.

In total, 98% said they would recommend the herbal program to a friend with similar symptoms.

DISCUSSION

The mean reported level of helpfulness with preexisting symptoms from the herbal treatment was 3.8 on a Likert-style index of 1 (not helpful) to 6 (most helpful). This contrasts with the reported helpfulness of 2.6 for conventional medical treatments that patients had tried. The helpfulness of herbal treatment was rated much higher for breathing difficulties, fatigue, exhaustion, and difficulty sleeping, all of which were rated above the mean in helpfulness at 4.0 or higher.

Herbal treatment of the most serious symptoms resulted in the highest (at or above the mean of 3.8) ratings of symptom relief. Herbal treatment therefore was helpful for those symptoms rated highest in seriousness by those surveyed.

Limitations on the generalizability of results from this study and survey are due to the lack of a control group of similar location, exposure, and symptoms post-9/11 with whom to compare those who received Ayurvedic herbal treatment. We also were limited by the participants' self-reporting of medical symptoms and their persistence or improvement, as opposed to objective medical testing of levels of impact for the cited symptoms. In addition, there are many confounding factors related to estimation of treatment impact, including use of conventional medical treatments prior to the herbal treatment and continuing use of these same or other medical treatments during and after Ayurvedic herbal treatment. The unique survey questionnaire has not been subjected to tests of validity and reliability and thus itself presents a challenge to generalizability from this single study. Alternative explanations for the reported impact of Ayurvedic herbal treatment include a "placebo effect" compounded by stress relief in the wake of profound stressful events and conventional medical treatment success when co-treatments occurred in the

observed population. A more general problem of methodological quality in clinical trials of treatment with herbal preparations also pervades this study, as standardization of herbal medicines (dosage and potency) is a perennial problem, and prospective, randomized, placebo-controlled clinical trials to support efficacy are lacking.

CONCLUSION

Significant improvements during Ayurvedic herbal treatment were reported by this high-risk, toxin-exposed population for specific symptoms that had been reported as not improving under conventional medical treatment, including cough, difficulty breathing, fatigue, exhaustion, not feeling well, difficulty sleeping, and other symptoms. None of the participants reported adverse reactions or significant problems beyond the 15% of respondents who reported initial gastric distress while adapting to the herbal treatment regimen. Those with serious unresolved medical symptoms such as cough, difficulty breathing, depression, fatigue, and exhaustion described finding relief through the Ayurvedic herbal treatment.

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