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Homeopathy for Acute and Chronic Otitis Media

By E-P. Barrette, MD, FACP

PLACEMENT OF TYMPANOSTOMY TUBES FOR OTITIS MEDIA IS THE most commonly performed surgery in children, except circumcision. In the United States, routine care for acute otitis media (AOM) usually includes antibiotics. In Europe, antipyretics and frequent early follow-up are common, with antibiotics reserved for children who fail to improve. Cost estimates for treatment of childhood otitis media are $5 billion annually.

Homeopathic practitioners have long advocated their remedies for otitis media. In a member survey of the American Institute of Homeopathy, which has an M.D. and D.O. membership, otitis media was tied for second place among the principal diagnoses of patients seeking care.[1] What is the evidence that homeopathy provides benefit for this common ailment?

History

More than 200 years ago, Samuel Hahnemann developed the medical system of homeopathy.[2] Based on the law of similars, homeopathic remedies are based on "provings," which are experiments in healthy subjects. This "like-cures-like" philosophy proposes that an agent which causes a symptom or group of symptoms in a healthy subject will serve as a remedy for someone suffering from the same symptom or group of symptoms.[3]

Homeopathy continues to maintain a unique position in the field of complementary medicine. It has a long and rich tradition in both Europe and the United States and competed with allopathic medicine until the opening of the 20th century. However, basing its practices on medicines, some of which have been diluted to the point of containing none of the original agent, has led to significant skepticism within the mainstream.

Current Practice

Both the United States and Europe are experiencing a resurgence of homeopathy. In the United States, sales of homeopathic remedies increased from $100 million in 1988 to $250 million in 1996. The

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National Center for Homeopathy claims 6,000 members. The number of homeopathy training programs increased from three in 1990 to 20 in 1996.

Current practitioners of homeopathy utilize various styles, e.g., *classical* when a single remedy is matched to the totality of symptoms, *clinical* when one or more remedies is matched to a conventional diagnosis, and *complex* when several remedies are combined to treat all the symptoms. Eighteenth century homeopaths referred to vitalism while contemporary practitioners refer to chaos theory and memory of water crystals.

Mechanism of Action

The major controversy over homeopathy involves "potentization" and serial dilutions. The substance is diluted one part in 10 to produce a D1 solution; one part in 100 makes a C1 solution. The solution is then shaken ("succussed"). A C2 solution results when one part of a C1 solution is mixed with 99 parts of solute and then agitated. Theoretically, dilutions greater than D24 or C12 (10^{-24}) contain no molecules of the original agent.

Dilutions are referred to as low potencies for C1 to C4, medium potencies for C5 to C11, and high potencies for greater than C11. No adequate explanation accounts for the success claimed with high-potency dilutions, i.e., very low concentrations.

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Table 1

Estimated costs for treating otitis media

Homeopath
$45-75 for initial visit (1 hour or longer); subsequent visits would cost considerably less

Pediatric Otolaryngologist
$100-250 for initial visit; $70-120 for audiogram

Pediatric Otolaryngologist (for Tympanostomy Tube Placement)
$300-1,000 for surgeon fees; total cost approximately $3,500

Sources: National Center for Homeopathy, telephone surveys

Pathophysiology of Otitis

Most children will suffer at least one bout of otitis by age three. The peak incidence is between six and 24 months of age. Infants' eustachian tubes are shorter and more horizontal than adults', thus facilitating reflux of fluid, viruses, and bacteria into the middle ear. Risk factors for otitis media include second-hand cigarette smoke, male sex, exposure to large numbers of children (e.g., day care), lack of breast feeding, and family history.

The most common pathogens are *Streptococcus pneumoniae*, *Moraxella catarrhalis*, and *Hemophilus influenzae*[4] and up to one-third of infections may be viral in origin.

Disease Course—Otitis

Although uncommon, severe complications of inadequately treated or untreated otitis media may occur. The introduction of antibiotics resulted in the dramatic reduction in the rate of otomastoiditis and intracranial complications of AOM.

AOM resolves spontaneously in 75% of cases.[4] This rate reflects bacterial infections that the immune system is able to clear, viral infections, and misdiagnosed cases. Antibiotics given early will improve the cure rate and decrease the complication rate. Since it is difficult to predict which children will improve without treatment, U.S. physicians routinely prescribe antibiotics for AOM.

Chronic otitis media with effusion (COME) often follows AOM and is the most common cause of hearing loss in children. Evidence suggests that a 20 dB or greater hearing loss will temporarily interfere with language development. COME with hearing loss for three or more months that fails to resolve with medical therapy may be treated with tympanostomy tubes with or

without adenoidectomy. (*See Table 1 for estimated costs associated with treating otitis media.*)

Clinical Studies—Otitis

An extensive search for all trials of homeopathy and otitis media resulted in finding only two studies. A German prospective study of AOM compared treatment by one homeopathic and four conventional otolaryngologists. This data set has been reported twice.[5,6] The study was neither randomized nor blinded.

Single homeopathic remedies were compared to usual care with antipyretics, decongestants, secretolytics, and antibiotics. One hundred three children were enrolled by the homeopathic physician and 28 by the conventional physicians. The duration of pain was longer in the conventional group (median 3 vs. 2 days, P = 0.12), as was the duration of therapy (median 10 vs. 4 days, P = 0.0001). Of note, the duration of antibiotics generally prescribed is 10 days; homeopathic treatments are stopped when improvement is noted. Audiograms were abnormal in an equal percentage of children. A greater number of children treated by homeopathy were free of recurrences at one year (70.7% vs. 56.5%, P not reported).

Selection bias complicates this study, as children treated conventionally were likely more difficult cases, since routine care for acute otitis media in Germany is by pediatricians, not by otolaryngologists. The children in the conventional group also had a higher rate of previous adenoidectomy (32.1% vs. 15.5%). Although the indication for adenoidectomy was not provided, this surgery is most often performed in children with recurrent AOM and COME. These children with prior adenoidectomy may have had infections refractory to usual treatments.

A non-blind randomized control trial for COME compared homeopathy to routine care by general practitioners.[7] Children with COME, > 20 dB hearing loss, and an abnormal tympanogram ages 1.5 to 9 years were included. Only 33 children were enrolled. Exclusion criteria included history of adenoidectomy, tonsillectomy, tympanostomy tubes, tympanic membrane disease, or craniofacial anomaly. One center randomized children by an alternate basis, a potential source of bias. Routine care involved watchful waiting, low-dose antibiotics, and tympanostomy tube insertion if no improvement was seen by 6-12 months.

More children in the homeopathy-treated group had improved hearing with < 20 dB loss at 12 months (64% vs. 56%, P > 0.2). More children four or younger were seen in the homeopathy group (10/17) than in the routine care group (5/16). Since children who will have difficulties with otitis generally present by age four, the older children in the routine care may have included children with more longstanding and difficult-to-resolve COME.

A related study compared homeopathy vs. placebo in a randomized, double-blind controlled format in children aged 1.5 to 10 years who had at least three upper respiratory infections in the past year or had two upper respiratory infections and otitis media with effusion at entry.[8] Exclusion criteria included history of adenoidectomy, tonsillectomy, and homeopathic treatment in the prior six months, chronic medical condition, or congenital malformation.

The children continued to receive routine care by their general practitioner. They also received either individualized homeopathic medicine or placebo for the entire one-year study. One hundred seventy-five children were enrolled. The groups were well balanced. Eighty-nine percent in each group had a history of AOM, while 58% had a history of COME. The mean daily symptom score was lower in the treatment group (2.61 vs. 2.21, difference 0.41, 95% confidence interval -0.02 to 0.83).

The authors felt the clinical relevance of this degree of difference was questionable. Antibiotic use decreased in both groups. Multiple outcomes, including measures of symptom scores during infections, episodes of upper respiratory infections, antibiotic use, antibiotic duration, adenoidectomies, and other measures all failed to reach statistical significance.

Adverse Effects

With the exception of contamination, homeopathic medications have been free of significant side effects.

Conclusion

AOM is a very common illness. Most cases will resolve spontaneously. Practitioners of homeopathy frequently treat children with otitis and claim success with this problem. However, there is no published evidence to support this claim.

In a condition that has such a high rate of spontaneous resolution, the experience of homeopathic practitioners may reflect only the natural history of this condition, recall bias, and selective follow-up. The greatest danger may be relying on an unproven therapy for COME with associated hearing loss, since speech may be delayed.

Recommendation

For AOM, homeopathy during the first 2-3 days may be analogous to the watchful waiting practiced by European physicians. However, COME that persists needs more careful evaluation and clinical treatment. ❖

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Chromium Supplementation in the Treatment of Type 2 Diabetes Mellitus

By Dónal P. O'Mathúna, PhD

DIABETES MELLITUS IS 90% TYPE 2 (NON-INSULIN dependent) diabetes mellitus.[1] Numerous supplements are alleged to prevent or treat it, especially chromium, the sales of which are second only to calcium among minerals.[2] Chromium picolinate, it is also claimed, enhances weight loss, increases energy, improves sports performance, curbs addictions, cures acne, prevents insomnia, relieves depression, and increases life span. But improved control of diabetes mellitus would be enough for clinicians to consider chromium's use.

Biochemistry

Chromium was identified as an essential trace element in 1959, and plays a role in insulin action.[2] Many ionic forms of chromium exist. Only 0.5-2% of dietary chromium is absorbed, leading to daily absorption of 1-200 nanograms. Urinary excretion levels are measured in parts per billion. Clinical research is hampered by the analytical challenges of accurately measuring such low concentrations, coupled with the lack of a simple, reliable test for chromium deficiency.

Pharmacology

Chromium deficiency was first reported in 1977. Some patients on long-term total parenteral nutrition developed classic diabetic symptoms that were reversed by chromium.[3]

Plasma chromium levels in diabetic patients are 40% lower and urinary excretion levels three times higher than in healthy patients.[4] Normal plasma levels are ~0.1 µg/L. Chromium is widely distributed in tissues, at levels 10-100 times plasma levels. However, plasma, urine, and tissue levels do not correlate well. High plasma chromium levels can exist with symptoms of deficiency and a negative chromium balance.

Mechanism of Action

Biochemical studies show that chromium increases insulin sensitivity and the number of insulin receptors on insulin-sensitive tissues. Chromium binds to an undetermined compound which both activates enzymes that enhance insulin's activity and inhibits enzymes that inactivate insulin receptors.[5] The currently accepted model is that chromium normally leaves the plasma in response to hyperinsulinemia, which sensitizes the tissue to insulin.[4] Chromium deficiency leaves cells desensitized to insulin, or resistant to insulin, a condition present in some patients with type 2 diabetes.

The picolinic acid found in chromium picolinate is an isomer of nicotinic acid (or niacin), which enhances chromium's absorption.

Clinical Studies

Mertz reviewed clinical studies using chromium for diabetes between 1966 and 1992.[6] Twelve of the 15 trials using clearly defined compounds and proper controls showed sugar or lipid improvements, but 11 of these had between six and 28 subjects. The largest and most recent trial was a randomized, double-blind, placebo-controlled trial (RDBPCT) involving 76 subjects with established atherosclerotic disease.[7] Twenty-five patients had stable type 2 diabetes while 51 were non-diabetic. Each group was randomized to receive either 250 µg chromium chloride or placebo in 5 ml syrup. While serum chromium levels were fivefold higher after one month of

Table 1

Chromium formulation and price comparison

Manufacturer	Formulation	Manufacturer's Recommended Dose	Price/ Quantity
Nutritional Dynamics Sugar Control Ultra	Two tablets contain 500 mg citrimax (*Garcinia cambogia* fruit standardized to 50% hydroxycitrate), 400 mg *Rehmannia glutinosa* root (naturally rich in in beta-sitosterol and aucubin), 250 mg L-glutamine, 250 mg L-alanine, 200 mg *Gymnema sylvestre* leaf (standardized to 75% gymnemic acids), and 500 µg chromium (polynicotinate)	2 tablets/d	$19.95/ 60 tablets
Rainbow Light Gtf Chromium Complex	One tablet provides 200 µg Gtf chromium (Chromemate® polynicotinate), 75 mg Hawaiian spirulina, 75 mg Chlorella (grown under heterotrophic conditions), 40 mg apple pectin, 1.5 mg L-glutathione, 328 mg custom herbal extract blend (Siberian ginseng, fenugreek seed, Chinese cinnamon bark, alfalfa leaf, *Gymnema sylvestre* leaf, reishi, artichoke leaf, licorice root)	1-3 tablets/d	$16.95/ 90 tablets
The Vitamin Shoppe Ultra Chromium Picolinate	One capsule contains 4 mg Chromax ii (compound of trivalent chromium and picolinic acid) supplying 500 µg trivalent chromium	1 capsule/d	$13.95/ 100 capsules
Twinlab Chromium Picolinate	One hard gelatin capsule contains 1.67 mg pure crystalline chromium picolinate supplying 200 µg trivalent chromium	1 capsule/d	$10.50/ 100 capsules
Futurebiotics Chromium Picolinate	One capsule contains 200 µg trivalent chromium from chromium picolinate (a patented form of biologically active, yeast-free, organically bound, glucose tolerance factor chromium)	1 capsule/d	$9.95/ 100 capsules
Source Naturals Gtf Chromium Yeast Free	One tablet contains 200 µg chromium gtf (Chromemate® [chromium polynicotinate]), 1.8 mg niacin (nicotinate)	1 tablet/d	$7.75/ 120 tablets
Solgar Co. Chromium Polynicotinate	One vegicap provides 200 µg chromium (niacin-bound, yeast-free chromium)	1 vegicap/d	$6.80/ 50 vegicaps

Source: Online mail-order companies

supplementation ($P < 0.005$) and remained elevated (mean duration, 11.1 months), fasting blood glucose levels were unchanged.

In contrast, U.S. investigators conducted a RDBPCT in China with three groups of 60 patients each receiving either placebo, 100 µg chromium picolinate bid, or 500 µg bid for four months.[8] Medications, diet, and exercise routines were unchanged. Fasting and two-hour postprandial blood glucose levels were significantly lower in the 1,000-µg group after two and four months ($P < 0.05$), but not in the 200-µg group or placebo. Fasting and two-hour postprandial blood insulin levels were significantly lower in both the 200-µg and 1,000-µg groups ($P < 0.0001$), but not the placebo group. HbA1c values were significantly lower in both chromium groups at four months, but in only the 1,000-µg group at two months (P not reported).

These researchers then invited Chinese type 2 diabetic patients to chromium supplement seminars.[1] Those purchasing supplements were randomly asked to volunteer for an uncontrolled study where fasting and postprandial blood glucose were measured monthly for 10 months. The 833 participants took 500 µg chromium picolinate daily. Fasting blood glucose levels dropped significantly after one month (10.0 to 8.0 mmol/L; $P < 0.05$), and were slightly lower after 10 months. Postprandial glucose levels decreased significantly after one month (12.0 to 9.9 mmol/L; $P < 0.05$) and were 8.0 mmol/L after 10 months. Participants completed a questionnaire before supplementation and after one month. Those reporting excessive thirst decreased from 334 to 47; those reporting excessive urination decreased from 322 to 40; and those reporting excessive fatigue decreased from 443 to 52 ($P < 0.001$).

Table 2

Selected dietary sources of chromium

Food	Serving Size	Chromium Content
American cheese	1 oz	48 µg
Peanut butter	1 tablespoon	41 µg
Cooked spinach	1 cup	36 µg
Chicken breast	3 oz	22 µg
Mushrooms	1 cup	20 µg
Wheat bread	1 slice	16 µg
Apple	1 medium	15 µg

Adapted from: Chromium. Mediconsult.com, Inc. Available at: http://www.cyberdiet.com/foodfact/ffarticles/1999. Accessed March 6, 2000.

Another observational study recruited 162 patients, 114 with type 2 diabetes and 48 with type 1.[9] All patients took 200 µg chromium picolinate every morning for three months, and halved their dose of hypoglycemic agents. Blood sugar levels in 74% of type 2 diabetic patients did not increase despite reduced medication ($P < 0.001$); 71% of the type 1 patients similarly responded positively ($P < 0.05$). Positive response correlated well with reduced HbA1c values (11.13 to 9.36; $P < 0.001$).

Chromium excretion during pregnancy and chromium supplementation for gestational diabetes have also been examined.[10] Twenty pregnant women with gestational diabetes were randomized to receive either 4 µg/kg/d chromium picolinate or placebo. Later, 10 more women with gestational diabetes were matched to the placebo group and received 8 µg/kg/d chromium. After eight weeks, significantly lower levels were found for fasting insulin and one-hour postprandial glucose, insulin, and C-peptide ($P < 0.05$ for all results in this study). HbA1c levels were reduced significantly in the 4-µg group only. No group changed in fasting glucose or C-peptide levels. Women with severe glucose intolerance still required insulin therapy: one taking 8 µg, three taking 4 µg, and four taking placebo. Uncontrolled observational studies with corticosteroid-induced diabetes ($n = 13$ and $n = 50$) also produced encouraging results.[11,12]

A RDBPCT examined moderately obese patients at risk for developing type 2 diabetes (> 125% optimal body weight and a first-degree relative with the disease).[13] After nutrition counseling designed to maintain body weight, 29 subjects took either 1,000 µg chromium picolinate daily or placebo for eight months. An insulin sensitivity test examined the ability of injected insulin to enhance intravenous glucose disappearance and inhibit hepatic glucose production. Those taking chromium showed significantly increased insulin sensitivity at four months ($P < 0.05$) and eight months ($P < 0.005$). No significant changes occurred in body weight, abdominal fat distribution, fasting insulin levels, HbA1c levels, or 24-hour insulin profiles.

Adverse Effects

Chromium supplements are believed to be safe, with no clinical studies reporting adverse reactions. The U.S. EPA safe exposure dose is 350 times the upper limit of the USDA adult estimated safe and adequate daily dietary intake.[5] Rats given several thousand times the equivalent of 200 µg chromium showed no adverse effects.[11]

One case of chronic renal failure was attributed to 600 µg chromium picolinate taken daily for six weeks.[14] Others disagreed with this diagnosis, including the research vice president of Nutrition 21, the company that holds the exclusive patent rights for manufacturing chromium picolinate.[15] Another case reported renal failure, liver dysfunction, and other problems after 1,200-2,400 µg chromium picolinate was taken daily for 4-5 months.[16] Acute, short-lasting cognitive, perceptual, and motor changes were reported an hour after another patient took 200-400 µg chromium picolinate.[17] Acute generalized exanthematous pustulosis was reported after 1,000 µg.[18] The FDA has received more than 500 adverse events involving chromium supplements, though most involve dietary supplements containing numerous herbs and other agents.[19]

More seriously, two in vitro studies demonstrated that chromium picolinate, and not other Cr^{3+} complexes, causes cleavage of DNA strands.[20] Industrial chromium toxicity is unrelated, because industrial chromium is Cr^{6+}.[19] Chromium picolinate's unique stability gives greater absorption, but therefore may have long-term side effects.

Drug Interactions

No adverse drug interactions have been reported. However, ascorbic acid, aspirin, and indomethacin markedly increase chromium absorption, while antacids lower absorption.[2] Diets high in complex carbohydrates, not simple sugars, increase chromium absorption.[2]

Formulation

Trivalent Cr^{3+} is the form of chromium found almost exclusively in foods, especially brewer's yeast, liver, American cheese, cereals, and wheat germ. The estimated safe and adequate daily dietary intake is 50-200 µg for adults.[2] About 90% of Americans consume less than this, but several studies found no detrimental effects

from diets containing less than 25 µg daily.[2]

Brewer's yeast and the saltbush plant (*Atriplex halimus*) are traditional chromium sources, but the most common supplement is chromium picolinate salt. Almost all chromium supplements contain chromium picolinate, usually 200 µg in capsules. Some studies used 1,000 µg/d, but optimal doses have not been determined. Numerous herbal combination products include smaller amounts of chromium picolinate. (*See Tables 1 and 2 for chromium supplement formulations and dietary sources.*)

Conclusion

Chromium's contribution to insulin resistance and diabetes is well-established biochemically. Supplements overcome deficiencies, but those already consuming adequate chromium would not be expected to show improvements, which likely explains much of the variability found in clinical trials. The U.S.-sponsored studies conducted in China are especially encouraging, but may not be applicable to other populations where dietary chromium levels are higher.

Chromium supplementation shows promise as an adjunct to conventional therapy in treating cases of type 2 diabetes mellitus involving chromium deficiency. However, there is currently no reliable diagnostic test to determine which patients are chromium deficient. Chromium picolinate gives better chromium absorption than other chromium salts, and appears to be safe. However, research on its long-term effects has not been conducted.

Recommendation

Chromium supplementation may benefit patients with type 2 diabetes mellitus who are chromium deficient. Without an accurate diagnostic test, a therapeutic trial with chromium picolinate is a reasonable way to assess benefit. Close monitoring of blood glucose is essential, with adjustment of other medications as necessary. Monitoring renal status is also important, especially if renal damage from diabetes is already suspected or documented. Although chromium may allow certain diabetic patients to reduce other medications, adherence to dietary and exercise guidelines remains a top priority. Patients should be encouraged to use reputable brands, since all products sold as dietary supplements are likely to vary widely in quality and concentration. ❖

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Turmeric (*Curcuma longa*) as an Anti-Inflammatory for Arthritis

By Teresa Klepser, PharmD, and Nicole Nisly, MD

ARTHRITIS IS A DISABLING DISEASE. MORE THAN 10% OF persons over the age 65 suffer from rheumatoid arthritis (RA), and millions more from osteoarthritis (OA). Common symptoms include morning stiffness, generalized malaise, and painful joints. Inflammatory synovitis, joint deformities, muscle spasms, bone and cartilage destruction, and/or vasculitic lesions are common.

Conventional therapies include non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroids, and slow-acting antirheumatic drugs (e.g., gold, methotrexate, and hydroxychloroquine), especially for RA. Dietary supplements have also been widely used, and those thought to provide benefit for arthritis include ginger, glucosamine, chondroitin, and turmeric.

Turmeric is a member of the ginger (Zingiberaceae) family that grows in tropical Asian countries and India.[1] The rhizome is the part of the plant of medical importance and is responsible for the yellow-orange color of the spice called turmeric.[1] Harvested at the end of the growing season, turmeric is sun-dried prior to use.[2]

Reported Uses

Turmeric has many reported uses including management of gastrointestinal problems such as peptic ulcers, appetite stimulation, flatulence, abdominal bloating, hepatitis, upper abdominal pains, colic, and diarrhea.[1-4] Among natives of Thailand and India turmeric is believed to be useful for the treatment of dizziness and gonorrhea and is commonly used as a tonic, blood purifier, antispasmodic, and digestive aid.[1] When applied topically, turmeric may be used to treat insect bites, ringworm, infected wounds, bleeding, and inflammation of the oral mucosa.[1,2]

Reported Indications

Turmeric has been approved by the German Commission E for the treatment of liver and gallbladder disorders and for loss of appetite.[2]

Constituents

Turmeric contains a wide variety of bioactive compounds, including volatile oil, curcuminoids, and 1,5-diaryl-penta-1,4-dien-3-on- derivatives. The volatile oil, which is 4-14% of the plant, consists of alpha- and beta-tumerone, artumerone, alpha- and gamma-atlantone, curlone, zingiberene, and curcumol.[5] The volatile oil is believed to give choleretic action (stimulation of bile production).[6]

The curcuminoids curcumin, demethoxycurcumin, and bidemethoxycurcumin make up 3-6% of the plant.[2,5] Curcumin gives turmeric its typical yellow-orange color.[3] It is believed that curcumin is the major active component that possesses anti-inflammatory properties.[4,6]

Curcumin is poorly absorbed when orally administered.[6] In rats, curcumin was excreted 38-75% in the feces.[7] The fraction of curcumin that is absorbed undergoes hepatic metabolism and subsequent excretion in the bile.[7] Curcumin is thought to demonstrate a local effect in the gastrointestinal tract and the systemic effects of the gallbladder at relatively low concentrations.[6]

Mechanism of Action

Curcumin has been demonstrated to exhibit anti-inflammatory activity in vitro and in vivo. Anti-inflammatory effects include arachidonic acid pathway enzyme modification, diminished neutrophil responses, stabilization of inflammatory cell membranes, and inhibition of platelet aggregation.[8,9] The volatile oil has been reported to stimulate the adrenohypophyseal axis activity.[10]

Laboratory and Animal Studies

Arora et al evaluated the anti-inflammatory effects of turmeric extract, two of its constituents (fractions A and B), and hydrocortisone vs. control using four different rat models of inflammation.[11] Using a cotton pellet method, researchers found that fractions A and B were almost as active as hydrocortisone; however, the extract was less effective. In a formaline-arthritic model, significant reduction of edema was observed with the extract, fractionated compounds, and hydrocortisone. According

Table 1

Turmeric formulation and price comparison

Manufacturer	Formulation	Manufacturer's Recommended Dose	Price/Quantity
Nutritional Dynamics	Each capsule contains 400 mg turmeric rhizome (*Curcuma longa*) standardized 95% curcumin	1 capsule/d	$17.45/60 capsules
Nature's Herbs Turmeric Power	Each capsule contains 400 mg turmeric extract standardized to 95% curcumin in an herbal base of turmeric	1 capsule 2-3 times/d with water	$15.49/60 capsules
Nature's Herbs Curcumin Power	Each preservative-free capsule contains 300 mg certified potency turmeric extract concentrate standardized for a minimum of preferred 95% curcumins in a synergistic base of whole turmeric powder	1 capsule 2-3 times/d with water	$15.49/60 capsules
Cardiovascular Research Ltd.	Each capsule contains 80 mg curcumin from turmeric,10 mg zingerone-gingerol compound, 1,500 mcg saffron (*Crocus sativus*)	1-2 capsules/d	$13.95/60 capsules

Source: Online mail-order companies

to a granuloma pouch method, the extract, fractions A and B, and hydrocortisone all reduced exudate formation among the rats. Lastly, using an adjuvant arthritis method, phenylbutazone was also injected in the rats. In this model, the inhibition of inflammation was significantly better with fraction A and phenylbutazone vs. hydrocortisone.

Clinical Studies

Few clinical studies have been published that demonstrate the benefits of turmeric among patients with arthritis. Although turmeric has also been suggested for use in OA, there are no published trials evaluating its efficacy in this setting.

In a randomized, double-blind, crossover study, Deodhar et al evaluated the effects of curcumin (400 mg tid) vs. phenylbutazone (Butazolin®) (100 mg tid for two weeks) in 18 patients with RA.[12] All anti-inflammatory agents were discontinued four days prior to study initiation. Endpoints included duration of morning stiffness, fatigue time, time required to walk 25 ft, articular index of joint tenderness, grip strength of both hands, overall general improvement by the observer and by the patient, and side effects.

Both agents demonstrated statistically significant subjective improvement in morning stiffness, walking time, and joint swelling; however, there were no improvements in any of the objective measurements noted. Both agents resulted in significant overall general improvement as determined by an observer; however, only phenylbutazone resulted in overall patient-perceived improvement.

Study limitations include small sample size, lack of a placebo group, and the absence of an interanalysis between turmeric and phenylbutazone. Because of its poor adverse effect profile, phenylbutazone was removed from the U.S. market by Geigy Pharmaceuticals as newer, better-tolerated NSAIDs became available.[13]

Adverse Effects

Stomach complaints, such as heartburn or ulcers, can occur following extended use or overdose.[2] Curcumin has been reported to induce abnormalities in liver function tests in rats.[15]

Sharp, transient hypotensive effects have been noted to occur in dogs following curcumin administration.[7] This effect has yet to be reported in man.

CNS effects potentially linked to curcumin include mild, transient giddiness.[14]

There are two cases of turmeric-induced allergic contact dermatitis in the literature.[16,17] The first, a 64-year-old Indian male who developed subacute dermatitis of the hands, forearms, and dorsa of the feet after working as a miller in a spice shop.[16] Allergy testing revealed a positive test result for *Curcuma longa* rhizome powder. This subject's dermatitis improved following administration of systemic and topical steroids. The second case involved a 31-year-old female who suffered from erythema on the

dorsa of her hands following self-medication with Chuu-ou-kou.[17] Following the use of Chuu-ou-kou her lesions worsened and the patient developed edematous erythema, papules, vesicles, and itching on her hands. Allergy testing resulted in a positive test for *Curcuma longa*, the main ingredient in Chuu-ou-kou.

Contraindications/Precautions

Medicinal doses of curcumin may act as a strong gastrointestinal irritant.[18] Turmeric should not be used in patients with bile duct obstructions or gallstones.[1,4] Caution should be used among patients with hyperacidity or irritable stomachs. In medicinal doses, turmeric should not be used in pregnancy, since higher doses may stimulate menstrual flow and the uterus; however, it is generally regarded as safe in pregnancy and lactation when used as a spice.[4] The safety of turmeric use as a medicinal during lactation is not known.[4]

Drug Interactions

No drug interactions have been reported in the literature.[1] However, turmeric may possess anticoagulation properties via its inhibition of thromboxane A2, B2, or both. Therefore, turmeric may increase the risk of bleeding among patients taking anticoagulants such as warfarin or antiplatelet drugs such as aspirin or other NSAIDs.[4,9,19]

Since some of the active ingredients of turmeric are hepatically metabolized, caution should be exercised when using concurrently with agents that are metabolized via the cytochrome P450 system.

Dosage

There are a variety of recommended preparations and dosages. Turmeric is available as a tincture, tea, or capsules.[2] The tincture (1:10) dosage is 10-15 drops two to three times daily.[2,4] Teas are not recommended, as the volatile oil and curcuminoids are fairly water insoluble.[6] Some capsules are formulated to give a standardized dose of 400-600 mg curcumin.[5] The average daily dose is 1.5-3 g of turmeric powder divided into two or three doses taken between meals.[2,4] (*See Table 1.*)

Since curcumin demonstrates poor absorption, it is often sold in combination with bromelain to enhance its absorption. The benefit of this combination has not been evaluated.[5] Topically, no typical dose is suggested in the literature.

Conclusion

Traditionally and historically, turmeric has been used in the treatment of inflammation, especially arthritis. Laboratory and animal data offer mechanistic support. Clinical data to support its use for this indication, however, are weak, though side effects appear to be rare.

Recommendation

Turmeric would not be considered a first-line agent for the treatment of arthritis given its contraindications and precautions, the potential for drug interactions, and the little clinical evidence. However, systemic side effects should be minimal. ❖

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Note to Readers

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CME Questions

20. High-potency homeopathic preparations:
a. contain one part substance diluted in 10 parts solute.
b. contain one part substance diluted in 5 parts solute.
c. contain high concentrations of the original agent.
d. contain low concentrations of the original agent.

21. Practitioners of homeopathy describe clinical homeopathy as:
a. when a single remedy is matched to the totality of symptoms.
b. when one or more remedies is matched to a conventional diagnosis.
c. when several remedies are combined to treat all symptoms.
d. None of the above.

22. The best way to establish chromium deficiency is to order:
a. commercially available blood tests.
b. special hair analysis tests.
c. careful observations of diabetic patients' responses to chromium supplements.
d. nutritional analysis of patients' diet.

23. The estimated safe and adequate daily dietary allowance of chromium for adults is:
a. 250 µg.
b. 50-200 µg.
c. 10-25 µg.
d. 50-200 mg.

24. Chromium picolinate supplements appear to be generally safe, although:
a. no long-term studies have been conducted.
b. there is some concern about potential mutagenic effects.
c. cases of renal failure have been reported.
d. All of the above.
e. None of the above.

25. Which of the following conditions is considered a contraindication for the use of turmeric?
a. Impotence
b. Gallstones
c. Migraines
d. Renal insufficiency
e. Congestive heart failure

26. Which of the following has been reported as a side effect?
a. Giddiness
b. Increased menstrual flow
c. Agitation
d. Blurry vision
e. Headache

27. Which of the following drugs may interact with turmeric?
a. Bromocriptine
b. Warfarin
c. Medroxyprogesterone
d. Penicillin
e. Probenecid

With Comments from John La Puma, MD, FACP

Homeopathy for Headaches and Migraines

Source: Ernst E. Homeopathic prophylaxis of headaches and migraine? A systematic review. *J Pain Symptom Manage* 1999; 18:353-357.

HOMEOPATHY IS OFTEN ADVOCATED as a prophylaxis of migraine and headaches. The aim of this systematic review was to evaluate the clinical trials, testing the efficacy of homeopathy for these indications. Independent computerized literature searches were carried out in four databases. Only double-blind, randomized, placebo-controlled trials were included. Four such studies were found. Their methodological quality was variable but, on average, satisfactory. One study suggested that homeopathic remedies were effective. The other methodologically stronger trials did not support this notion. It is concluded that the trial data available to date do not suggest that homeopathy is effective in the prophylaxis of migraine or headache beyond a placebo effect.

COMMENT

One of the most prolific and scientifically rigorous authors in alternative medicine, Ernst here reviews the assumptions of homeopathy. The individual requires treatment, not the disease. Remedies can be simultaneously diluted, shaken, and potentiated. A molecule that causes symptoms in healthy people can treat the same symptoms in ill people.

What is the allure of homeopathic medications? Is it that their names are fun to say (silicea), pretty (belladonna), floral (cyclamen), suggestive (ignatia), or elemental (sulfur)? Or is it that they can be purchased while shopping for groceries, over-the-counter, like teas from a jar? Or that their theory of use is so anti-rational that it attracts those of us who think we have little control over what happens in life anyway, so why not?

Ernst included analyses from MEDLINE, Embase, CISCOM, and the Cochrane library, and whittled 400 publications down to four, totaling fewer than 300 patients, most of whom had migraine headaches, variably defined. Treatment lasted an average of 12 weeks; follow-up ranged from 12 weeks to five months. Results were mixed: Two trials were positive, and two were negative, and the latter two were the strongest trials methodologically.

Ernst speculates that a substantially longer treatment phase or a substantially higher dosage might be needed to see effect. He also acknowledges that homeopathy might only be as good as placebo for headaches (which is probably the case).

Recommendation

Advise patients with headaches to save the money they would spend on homeopathic remedies—they do not appear physically harmful or more effective than placebo. ❖

Allergic Reaction to Henna

Source: Lyon MJ, et al. Allergic contact dermatitis reaction to henna. *Arch Dermatol* 2000;136:124-125.

"A HEALTHY 30-YEAR-OLD WOMAN obtained a henna 'tattoo' from a street vendor on a California beach. Ten days later she noted pruritus followed by multiple small papules overlying the pattern encircling her left arm. Several days later, the design appeared erythematous and raised, sparing the unpainted areas (tracing the outline of the pattern). Treatment with topical diflorasone diacetate resulted in gradual improvement with resolution in several weeks. The patient denied prior exposure to henna. She chose not to have a skin biopsy and patch testing to henna. However, the time course and clinical morphology of the dermatitis were typical of a type IV hypersensitivity reaction to henna."

COMMENT

Henna is an Old World shrub that grows both in North America and in the Middle East—most famously in Egypt. The family Lythraceae contains several different genus and species, including Henna (*Lawsonia inermis*). The bark of one shrub yields a yellow color; the leaves of another yield red. Henna's leaves give a reddish brown color to skin and hair—the leaves are powdered, revitalized with water, and a cosmetic paste created and then applied.

Henna is a little like costume jewelry—beautiful designs and intricate patterns can be created for relatively little money. And like costume jewelry, henna does not last forever. In fact, a do-it-yourself kit, sold in drugstores and supermarkets across the country, will yield just 3-4 weeks of visual pleasure.

This is, the authors report, the first case of type IV hypersensitivity to henna, though contact dermatitis and type I hypersensitivity have been documented in India and reported in the medical literature. There is no skin penetration with henna tattoos, and the danger of actual systemic harm appears to be nil.

Recommendation

Know that hypersensitivity to henna exists, is rare, is treatable, and is self-limited. ❖

In Future Issues:

St. John's Wort and Depression

MSM for Osteoarthritis