Commentary: Time to Research Echinacea Properly.


This issue carries a study “Echinacea purpurea for Prevention of Upper Respiratory Tract Infections in Children,” by Weber et al. (pp. 1021–1026). Despite the beneficial outcome from use of this herb reported by the authors, would-be users of echinacea (Echinacea spp.) can be forgiven for feeling fraught in trying to come to grips with a stream of recent contradictory press stories about the efficacy of this well-known medicinal herb. These users are caught in the increasingly partisan crossfire between researchers who, on the one hand, claim that taking echinacea to treat colds and flu is at best no better than placebo, and on the other hand, researchers who assert that the remedy can indeed reduce the symptoms of colds and flu. To confuse the picture still further, over-the-counter (OTC) echinacea products come in a bewildering range of forms (pills, freeze-dried powders, tinctures, fluid extracts, fresh juices, and teas) at different concentrations and recommended dosages. A Cochrane Systematic Review of echinacea notes that there are more than 200 different preparations of echinacea on the market. Moreover, such products contain any one or combination of at least three species of echinacea (E. angustifolia, purpurea, and pallida) and may contain extracts of echinacea root or leaf or both. How can one make any sense of all this?

It seems that researchers, too, are just as bewildered as the general public since, while a particular herbal study may be well-designed and run, all too often, researchers who are designing a trial make the elementary mistake of failing to ensure the quality of the herb or even its species or dosage, thus making nonsense of their findings. Nor is this muddle confined just to echinacea. Writing in the American Journal of Medicine, researchers from Denver assessed the extent to which recently published randomized controlled trials of single herbal preparations of echinacea, garlic (Allium sativa), gingko (Gingko biloba), saw palmetto (Serenoa repens), or St John’s wort (Hypericum perforatum) had bothered to characterize and verify the content of the herbal products under study. In the 81 randomized controlled trials reviewed, only 15% reported undertaking tests to quantify the content of the herbal remedies being used while only 4% provided adequate data to compare actual with expected content values of at least one chemical constituent in the products. The authors of the American Journal of Medicine paper noted that, in the 3 studies of 81 that had compared actual with expected content values of one chemical constituent, the content varied widely between 80% and 113% of expected values.

We need to take this lack of precision into account when evaluating research into echinacea published in even the most prestigious medical journals. It is not just the quality or authentication of the plant under study that is critical to the success of any herbal research. The dosage of the remedy is also obviously a crucial matter. Most herbal practitioners I know, use relatively high doses of echinacea to treat a cold or flu at the onset of symptoms. Whenever I begin to get a cold, I immediately commence taking 5 mL of a 1:5 tincture (45% ethanol) of E. angustifolia root in water about every 3 hours, throughout the day, thus taking approximately 20–25 mL per day. This corresponds to a dose of approximately 4–5 g of the dried root per day day. It is noteworthy that the dosage recommended in a well-known textbook on herbal medicine for short-term use in acute conditions is well in excess of this—ranging from 10 to 15 g of the dried root of E. angustifolia per day (or its equivalent in liquid or tablet preparations). The British Herbal Compendium recommends as a standard dose up to 5 mL of a 1:5 tincture of dried root of E. angustifolia three times per day. This equates to 3 g of the dried root per day—which is the dosage of dried root also recommended by this publication. The Compendium comments that, in 1987, it became apparent that a considerable amount of E. angustifolia cultivated in Europe was in fact E. pallida and warns that data on E. angustifolia published prior to 1987 and based on material of commerce from European sources should thus be reviewed with caution.

In the United States, doctors of the Eclectic tradition, such
as Finley Ellingwood, for whom *E. angustifolia* was an invaluable life-saving remedy, recommended significant doses to treat “septic fevers.” His 1919 *American Materia Medica* recommends 20 drops of the fluid extract of *E. angustifolia* to be administered every 2 hours to treat this condition. Fluid extracts, which are more concentrated than tinctures, are usually prepared at a ratio of 1:1 weight/volume, so Ellingwood was recommending taking just over a g of dried root every 2 hours (adult dose) for this acute condition. If one compares these “practitioner dosages” with the dosages suggested on the packs of most OTC echinacea products, the dosages of the OTC products often appear remarkably low in comparison. Are these lower dosages really efficacious?

In the light of this discussion, we can perhaps begin to assess research conducted on the efficacy of echinacea to treat colds and flu. A recent paper published in the *New England Journal of Medicine* evaluated the efficacy of *E. angustifolia* in experimental rhinovirus infections. The study concluded that *Echinacea angustifolia* showed no significant effects on infection with a rhinovirus or on clinical illness that results from it. This paper gave rise to a plethora of news stories declaring that echinacea was ineffective to treat the common cold. But is this fair? The subjects in the trial took three doses of 1.5 mL of three possible *E. angustifolia* extracts approximately equivalent to 300 mg of the dried root in each dose, so delivering the equivalent of approximately 900 mg a day of the dried root. It seems that this dosage level was selected for the study because it corresponds to the dose recommended by the German Commission E. But, if we compare this with what U.K. herbal practitioners usually recommend for treating acute conditions, the dose used in this trial was probably too low to produce an effect. This said, a German study using much the same dose registered a positive result. In this case, in a double-blinded, placebo-controlled trial, 180 patients with influenza were randomised into three groups of 60. These three groups were given a tincture of *E. purpurea* root (1:5 in 55% ethanol) at daily dosages corresponding to 450 mg or 900 mg of the dried root, or placebo. After 3–4 days and 8–10, days there was no statistical difference in symptoms between the group taking the 450-mg dose and the placebo group. In contrast, the group taking the 900-mg dose showed a highly significant reduction in symptom score at both timepoints. This trial does seem to support the notion that higher doses of echinacea are required to ward off an acute onset of cold or flu successfully. It is not clear, however, why the 900-mg dose seemed effective in one trial and not in the other.

Different species of echinacea were used, of course, and this raises further questions about the relative merits of different species of the plant.

As mentioned, the trial published in the *New England Journal of Medicine* used the root of *E. angustifolia*. This was the species of echinacea exclusively used by the Native American tribes and was the main species used later by the American settlers and the Eclectic doctors who popularized its use. One of them, Ellingwood, mentions that there was confusion among American doctors as to the exact identity of the medicinal form of echinacea. He commented that “Echinacea purpurea of the Eastern States has been thought to be identical with *Echinacea angustifolia* of the Western States”. But he noted, “It is often used for the same purposes, but is universally disappointing.” In his book on echinacea, Desmond Corrigan tells how *E. purpurea* came to be the main species of echinacea used in Germany and across much of Europe. He recounts how Dr. Gerhard Madaus, founder of the famous German phytopharmaceutical company, Madaus AG (headquartered in Dresden-Radebeul Germany), devoted a whole chapter in his book *Textbook of Biological Remedies*, (published in 1938) to the medicinal properties of *E. angustifolia*. But according to Corrigan, when Madaus attempted to import *E. angustifolia* seed from the United States, his consignment subsequently turned out to be *E. purpurea* seed. This case of mistaken identity led researchers to investigate *E. purpurea* rather than *E. angustifolia* so that, as Corrigan points out, almost all of more than 350 research projects on echinacea, performed in Europe over the past 50 years have utilized this species of echinacea.

But could Ellingwood have been right in saying that *E. angustifolia* is superior to *E. purpurea*? And is there any merit in *E. pallida*? We will only really know if researchers design their studies to compare and contrast the efficacy of all three species in combating colds and flu, utilizing doses that are plausible according to traditional use going back well over a hundred years. Studies should also investigate the relative merits of root or leaf since both are currently used although the use of the root is more authentic from a historical point of view. It goes without saying that researchers should check the authenticity and quality of the herbs they use in their studies. Hardly surprisingly, when the Cochrane Systematic Review assessed sixteen trials on echinacea that included 3396 participants, the reviewers commented that “the review found it difficult to compare echinacea trial results, as the preparations varied greatly... variation in preparations investigated and methodological quality of trials precluded quantitative meta-analysis.” In these circumstances and given the extraordinary popularity of echinacea products, it is surely time to research the efficacy of echinacea more precisely.

**REFERENCES**


Address reprint requests to:

Midsummer Clinic
Church Westcote
Chipping Norton
Oxfordshire 0X7 6SF
England
E-mail: e翰@globalnet.co.uk