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Original Research Article

The use of *Scutellaria lateriflora*: A pilot survey amongst herbal medicine practitioners

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ARTICLE INFO

Article history:

Received 16 February 2012

Accepted 4 April 2012

Available online 26 May 2012

Keywords:

Scutellaria lateriflora

Skullcap

Anxiolytic herbs

Survey

Medical herbalists

ABSTRACT

American skullcap (*Scutellaria lateriflora*) is a popular herb in traditional medicine systems and western materia medica for the treatment of anxiety and related disorders. It is reported to be one of the most widely used medicinal herbs, with anecdotal evidence for minimal side-effects and with no known toxicity. This article summarises the results of a pilot survey conducted amongst herbal medicine practitioners on their use of *S. lateriflora*.

An email survey was conducted amongst herbal medicine practitioners in the UK and Ireland. It aimed to gather information on the extent of, and indications for, current use of *S. lateriflora*, its perceived effectiveness and its safety. Herbal medicine practitioners were selected from the membership list of the National Institute of Medical Herbalists (NIMH). All members with identifiable email addresses were contacted ($n = 377$) and responses were received from 62 (a 16% response rate).

The results of the survey suggested that *S. lateriflora* is highly regarded amongst herbal medicine practitioners as an effective intervention for reducing anxiety and stress and is commonly prescribed for these conditions and related co-morbidities. The results were not conclusive as the response rate was low and respondents were only those with email access.

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1. Introduction

American or Virginian skullcap (*Scutellaria lateriflora*) (Fig. 1) is a perennial herb belonging to the *Lamiaceae* (mint) family (also known as *Labiatae*), sub-family *Lamioideae*, and is one of 360 known *Scutellaria* species worldwide (Cole et al., 1991; Malikov and Yuldashev, 2002), many of which are used medicinally

(Joshee et al., 2002). It grows on wetlands and is indigenous to North America and Canada where it is widely distributed – from Alaska to Florida and British Columbia to Quebec (the only places it is not found are the North-west Territories, Alberta and Yukon in Canada and Wyoming, Nevada and Utah in the US) (USDA, 2012). It is grown commercially worldwide, including in Australia and New Zealand (Wills and Stuart, 2004).

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<http://dx.doi.org/10.1016/j.hermed.2012.04.005>



Fig. 1 – *Scutellaria lateriflora* (© C. Brock).

Scutellaria lateriflora is used extensively and has been highly valued in traditional western herbal and ethnobotanical medicines for the treatment of anxiety, hysteria, phobias, panic attacks, tension, depression, sleep disorders and stress (Felter and Lloyd, 1898; Joshee et al., 2002). Known as a woman's herb by Native Americans, the Cherokees used it as an emmenagogue, thus promoting menses and aiding expulsion of the placenta following childbirth. Native American women also used it to ensure general menstrual health (Joshee et al., 2002) as well as for mastalgia and premenstrual tension (Greenfield and Davis, 2004). Some tribes still use it in ceremonies to induct girls into womanhood and for purification rituals (Joshee et al., 2002).

The first European to record its use (in 1787) as a medicinal herb was German Physician Johann David Schöpff, who noted its use as a tonic for fevers and as an abstergent (detergent) (Upton et al., 2009). It was mentioned in the first *American Materia Medica* in 1785 but had been in longstanding use as a home remedy before then (Lloyd, 1911). Dr. Lawrence Van Derveer (1740–1815) studied *S. lateriflora* extensively and used it as a treatment for rabies (hydrophobia); it was then used for this purpose both professionally and as a home remedy. In 1819 Dr. Lyman Spalding wrote 'A history of the introduction and use of *Scutellaria lateriflora* (scullcap), as a remedy for preventing and curing hydrophobia, occasioned by the bite...' (Lloyd, 1911; New Jersey Historical Society, 2001). Medical doctor Joseph Bates wrote in 1855 in the *Boston Medical Journal* (Bates, 1855) that because *S. lateriflora* was eventually scientifically proved to be utterly useless for this purpose it fell into disrepute and was consequently removed from pharmacopoeias. He nevertheless described using *S. lateriflora* in his practice, claiming a fluid extract had great value in the treatment of nervousness, irritability and restlessness, particularly in children. He also held it in high regard for hysteria and for relieving symptoms of inflammation in patients with arthritis or convalescing from fevers. He prophesied that it would be found to be highly successful in treating many diseases in

the future, particularly those for which opium was currently prescribed (Bates, 1855). In 1860 it was introduced into the official *United States Pharmacopoeia* as *Extractum Scutellariae Fluidum* (Millspaugh, 1892; Upton et al., 2009) but was dropped in 1910. It was in the *US National Formulary* in 1916 and removed in 1942 when interest in natural remedies declined. It is not included in the *European Pharmacopoeia* (Upton et al., 2009).

Modern herbal medicine's application of *S. lateriflora* appears to be based upon its traditional uses for anxiety states. Greenfield and Davis (2004) for example, suggest it is used most commonly for insomnia, nervous disorders and digestive disturbances. Bergner (2002) proposes its action is primarily as a trophorestorative on the central nervous system (CNS), allowing relaxation following nervous exhaustion (Bergner, 2002). It is also prescribed by western herbalists for epilepsy (British Herbal Medicine Association, 1983), post-stroke paralysis, atherosclerosis, hyperlipidaemia, allergies, skin conditions and inflammation (Natural Medicines Comprehensive Database, 2011).

A small clinical study assessing acute effects of *S. lateriflora* indicated it has anxiolytic actions with minimal loss of cognition (Wolfson and Hoffmann, 2003). The authors assessed the anxiolytic properties of the herb in a double-blind, placebo-controlled crossover study of 19 healthy volunteers. Participants took either two placebo capsules, one capsule containing 100 mg of organic freeze-dried *S. lateriflora* extract, two capsules of these, or one capsule of 350 mg organic freeze-dried *S. lateriflora*. Participants' energy, cognition and anxiety were self-rated at various time points up to 2 h following administration of test or placebo substances, when measurements tended to return to baseline. The three herb tests all had notable effects in reducing subjective anxiety scores when compared to placebo, the most effective being the two 100 mg capsules. There was only a very mild decline in cognition and energy with the herbs, with no adverse reactions or side-effects, suggesting that *S. lateriflora* could be a valuable anxiolytic – as many anxiolytics impair cognitive function and physical performance (Wolfson and Hoffmann, 2003). It is unclear whether the results were statistically significant as this was not determined.

Furthermore, two studies found major skullcap flavonoids, including baicalin, baicalein and wogonin, extracted from *S. baicalensis* but also found in *S. lateriflora*, had affinities for the benzodiazepine binding site of gamma-aminobutyric acid A (GABA_A) receptors, suggesting anxiolytic properties for these flavonoids (Hui et al., 2000; Liao et al., 1998). Ligands binding to the benzodiazepine site of the GABA_A receptor decrease the likelihood of action potentials by excitatory neurotransmitters such as adrenalin and noradrenalin, implicated in anxiety and stress (Paladini et al., 1999; Rabow et al., 1995). Another study found both hot water and 70% ethanol extracts of whole aerial parts of *S. lateriflora*, as well as six major isolated flavonoids (baicalin, scutellarin, wogonin, lateriflorein, ikonnikoside I and dihydrobaicalin), bound to serotonin-7 (5-HT₇) receptors, suggesting the potential of *S. lateriflora* for attenuation of negative mood states (Gafner et al., 2003).

Modern pharmacology research has demonstrated anti-tumour, anti-inflammatory, anti-viral, antibacterial and hepatoprotective effects of individual compounds, particularly the flavonoids, found in the *Scutellaria* genus (Shang et al., 2010).

In common with all *Scutellaria* species studied *S. lateriflora* is rich in flavonoids, a group of phenolic compounds that are highly active physiologically, with a wide range of pharmacological actions (Li et al., 2012; Malikov and Yuldashev, 2002; Shang et al., 2010). Baicalin, baicalein and wogonin are considered to be major active flavonoids in *S. lateriflora* and have been researched extensively because of their presence also in *S. baicalensis* (Joshee et al., 2002; Li et al., 2012).

Since 1998 a large number of compounds have been isolated from *S. lateriflora* (Shang et al., 2010), which could have far reaching implications for research into its actions and indications. Most recently (Li et al., 2012), using a sensitive method of HPLC with ultraviolet photodiode array and electrospray ionisation tandem mass spectrometric detection (HPLC-DAD/ESI-MS), six more flavonoids were isolated from methanolic extracts of authenticated *S. lateriflora* aerial parts. The flavonoids identified in this species for the first time are norwogonin-7-O-glucuronide, wogonin-7-O-glucuronide, 5,7-dihydroxy-6,8-dimethoxy flavone-7-O-glucuronide, dihydrooxylin A-7-O-glucuronide, galangin-7-O-glucuronide, and 5,6,7-trihydroxy-flavanone-7-O-glucuronide (Li et al., 2012).

More than one species within a genus may possess exactly the same or similar flavonoids. For example, in common with many other *Scutellaria* species, *S. lateriflora* and *S. baicalensis* have similar phytochemical constituents, although in differing ratios and quantities, which may explain the differing traditional uses amongst *Scutellaria* species (Cole et al., 2008). Using HPLC, Cole et al. (2008) quantitatively compared the content of flavonoids scutellarin, wogonin, baicalin and baicalein in aerial parts of *S. lateriflora*, *S. baicalensis* and *S. racemosa* grown in identical conditions. *S. lateriflora* contained the highest amount of baicalein whilst *S. baicalensis* contained 800 times more scutellarin than the other two herbs. Of the three herbs *S. racemosa* had the highest wogonin content. Baicalin content was similar for the three herbs (Cole et al., 2008), which differs from the findings of Makino et al. (2008) who found baicalin content in the leaves and stems of *S. baicalensis* was insignificant in comparison to *S. lateriflora*. There was slightly more baicalin in *S. baicalensis* root than in *S. lateriflora* leaves (Makino et al., 2008). Interestingly, of five skullcap species analysed (*S. baicalensis*, *S. lateriflora*, *S. racemosa*, *S. tormentosa* and *S. wrightii*), Islam et al. (2011) found a greater baicalin content in the roots of *S. wrightii* than in root, stem or leaf of the other species and 5-fold higher than in *S. baicalensis* root. The authors also demonstrated that *S. wrightii* and *S. tormentosa*, previously uncharacterised species, are good sources of the flavonoids scutellarin, baicalin, baicalein and wogonin. As these flavonoids are also found in *S. lateriflora* there are implications that these species also have medicinal properties. It is possible that differences in flavonoid concentration between studies may have been due to differences in growing conditions.

Commercial herbal products have been found to contain significant variations in phytochemical profile within a species. Such variation may be according to geographic region, biodiversity, ecological variations, cultivation, seasonality, harvesting, and storage time affecting stability; processing method, marc to menstruum ratio and alcohol concentration (Ciddi and Withaferin, 2006; Gao et al., 2008).

Notwithstanding these variations, another problem is whether or not the herb is the correct species. Studies have

shown wide variations in phytochemical profile of herb claimed to be *S. lateriflora* Zhang et al. (2009), for example, discovered a wide variation in individual and total phenolic content in 10 different commercial preparations of *S. lateriflora* (analysed by HPLC and compared with *S. baicalensis* and whole, freeze-dried extract). Baicalin content, for example, varied from 0.48% to 10.10% (compared to 18.95% for whole extract). Total phenolic content for these two preparations was 1.11% (extract – type not described) and 20.55% (fine powder in a capsule) respectively (41% for whole extract) (Zhang et al., 2009).

Another HPLC analysis (Gao et al., 2008), of seven commercial preparations (obtained from five companies), which compared baicalin, baicalein and wogonin content of *S. lateriflora* (four samples of *S. baicalensis* were also analysed), also found wide variations in individual and total content of these flavonoids. One sample contained no baicalin, baicalein or wogonin. Of all three flavonoids, $\mu\text{g/ml}$ ranged from 180, 280 and 97.5 to 12,700, 629 and 152 respectively (Gao et al., 2008). One commercial *S. lateriflora* tincture tested by Gao et al. (2008), which had the highest flavonoid content (12.66 mg/ml), was extracted in 45% ethanol, whereas the others were extracted in 25% ethanol. When the investigators later compared extraction in 25% and 45% ethanol from the same batch of *S. lateriflora* plant material they found that 45% ethanol yielded around five times more flavonoids than 25% ethanol (Gao et al., 2008).

Quality control and correct identification may be of particular importance in the case of *S. lateriflora* because of the large number of *Scutellaria* species (Malikov and Yuldashev, 2002) and frequent substitution or adulteration with other skullcaps or potentially harmful herbs such as germander (*Teucrium*) (Wolfson and Hoffmann, 2003). Respondents to the practitioner survey said they used a variety of suppliers, mainly for price, convenience or habit but it is important to ensure the herb has been authenticated.

Anxiety, stress and related disorders are problems treated most frequently in the herbal medicine clinic (del Mundo et al., 2002). As *S. lateriflora* is reported to be one of the most used herbs in western materia medica (Bergner, 2002) it is likely that this is the herb of choice of western medical herbalists for these conditions. The purpose of the survey was to provide further evidence for its popularity in relation to other herbs used for the same conditions, to gather anecdotal evidence of its effectiveness and to gain information about prescribing practices such as dosage and duration of treatment, why it is prescribed and any reported issues in using it. The results may help to inform treatment protocols in clinical studies. A brief version of the survey was reported previously (Brock et al., 2010) along with a more detailed scientific basis for the use of *S. lateriflora*.

2. Materials and methods

UK and Ireland herbal medicine practitioners with an email address identifiable from the register of the National Institute of Medical Herbalists (NIMH) were contacted. NIMH members are qualified herbalists who have undergone several years' rigorous scientific training, following which they take consultations with patients with a wide range of conditions, using the same diagnostic skills and examination techniques as

Table 1 – Actions and indications attributed to *S. lateriflora*.

Actions attributed to <i>S. lateriflora</i> (n = 62)	N	Indications/reasons for prescribing <i>S. lateriflora</i> (n = 62)	N
Nervine/nerve trophorestorative	40	Anxiety	59
Anxiolytic	22	Insomnia and other sleep-related disorders	33
Relaxant	20	Stress	21
Mildly sedative	14	Migraine and other types of headaches	13
Calming	8		
Antispasmodic or spasmolytic	8	Depression	9
Cooling	4	Drug withdrawal and addiction	8
Tranquilising	4	Nervous and muscular tension	7
Anti-inflammatory	3	Panic attacks	7
Anti-stress	2	Fear and phobias	7
Mood lifting	2	Eczema, psoriasis/stress-related skin conditions	6
Anti-allergy	2	Physical and mental exhaustion	5
Parasympathetic	1	Excessive thought processes	5
Anti-panic	1	Hypertension	5
An emotional balancer	1	Palpitations	5
Antidepressant	1	Irritability	3
Supporting	1	Twitches and spasms of nervous origin/convulsions	2
Digestive tonic	1	Premenstrual syndrome (PMS)	2
Sustaining	1	Allergies	2
Anti busy brain	1	To put things into perspective	2
Bringing focus	1	Nervousness	2
		Chronic fatigue syndrome	2
		Irritable bowel syndrome	2

N = number of practitioners stating actions and/or indications/reasons for prescribing.

orthodox doctors. This organisation was chosen as it is the largest organisation representing medical herbalists in the UK. As a number of herbalists belong to more than one representing organisation there was a risk of some receiving a survey questionnaire twice if more than one register was used. Each of the 377 practitioners selected received an electronic letter and survey questionnaire form.

A mixed methods approach was used with mainly open questions in order to gather as much information as possible about practitioners' experiences with, and beliefs about, *S. lateriflora*. Respondents were asked:

- Whether they regularly prescribe *S. lateriflora* and, if not, reasons for not doing so.
- What they thought were its main actions and indications.
- What they prescribed it for and for how long.
- The length of time in which they expect to see a response in patients and what responses they expected to see.
- What patients reported from its use.
- Whether there have been any reported side-effects and what were perceived contra-indications.
- Type of preparation used and reasons for choices.
- Dosage and strength.
- Whether used alone or in combination.
- What was their favourite herb for anxiety?
- They were also asked how long they had been in practice and to add any additional comments should they wish to do so.

3. Results and discussion

Of 377 questionnaires sent, 62 practitioners responded (16%). Of all respondents, 57 (92%) said they regularly prescribe *S. lateriflora*. Length of time in practice and experience varied

widely but generally the respondents comprised a group of highly experienced herbal practitioners. The average length of time in practice was 9.03 years (SD = ±7.14) and the average time spent with patients per week was 10 h per practitioner.

3.1. Actions and indications attributed to *S. lateriflora*

The majority of respondents provided more than one indication and/or action and use of *S. lateriflora* (Table 1). There was some confusion over the difference between actions and indications and most common conditions for which it is prescribed. For example, 77% (n = 48) of respondents said they would prescribe it for anxiety but only 35% (n = 22) suggested it has an anxiolytic action and only 18% (n = 11) gave anxiety as an indication for the herb. For simplicity, 'indications' and 'reasons for prescribing' have been amalgamated in Table 1. The confusion between actions and indications and reasons for prescribing is interesting and deserves consideration by herbalists generally; it calls into question how a misunderstanding of the language might potentially impose restrictions to the way in which herbs are used. If so, such an impediment may impact upon herbal practice as a whole. Rigorous scientific research could explore this issue.

3.2. The practitioners' choice for anxiety

Results indicate the principal use of *S. lateriflora* is for relief of anxiety, stress or associated conditions with most 77% (n = 48) survey respondents stating they would prescribe it specifically for anxiety and all said they would prescribe it for anxiety-related co-morbidities. When asked what is their preferred herb for anxiety, 25 (40%) chose *S. lateriflora* (Fig. 2). It is interesting to note that one respondent indicated

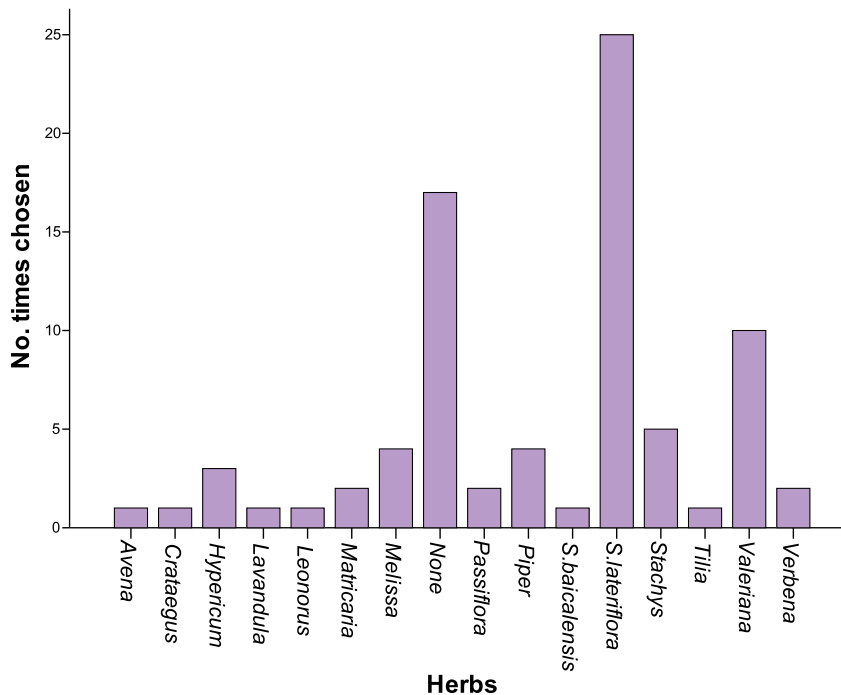


Fig. 2 – Anxiolytic herbs as preferred by survey respondents. Key: Avena = *A. sativa* (oats); Crataegus = *Crataegus* spp. (hawthorn); Hypericum = *H. perforatum* (St. John’s wort); Lavandula = *Lavandula* spp. (lavender); Leonorus = *L. cardiaca* (motherwort); Matricaria = *M. recutita* (German chamomile); Melissa = *M. officinalis* (balm); None = no preference; Passiflora = *P. incarnata* (passion flower); Piper = *Piper methysticum* (kava-kava); S. baicalensis (baical skullcap); S. lateriflora (American skullcap); Stachys = *S. betonica* (wood betony); Tilia = *Tilia* spp. (linden); Valeriana = *Valeriana officinalis* (valerian); Verbena = *Verbena officinalis* (vervain). NB: Many survey respondents gave more than one choice but overall the herb of choice was *S. lateriflora*.

their preferred anxiolytic as being *S. baicalensis* as, although *S. baicalensis* root is most commonly used for inflammation (Joshee et al., 2002), it is reported to have been used as a sedative (Liao et al., 1998). Conversely, *S. lateriflora* is reported to have been traditionally used for inflammation. The Iroquoi tribe, for example, used it ‘to keep the throat clear’ (Joshee et al., 2002). Additionally, both *S. lateriflora* and *S. baicalensis* have been found to inhibit cyclooxygenases *in vitro* (Gafner et al., 2004; Jia et al., 2007).

Common reasons for prescribing *S. lateriflora* are provided in Table 1. All respondents who regularly prescribe *S. lateriflora* (92%) identified use for anxiety as distinct from depression and whilst some reported it useful also in depression, two respondents reported it as unsuitable for significant depression (described as “mentally depressed states” and “severe depression”) as in their opinion it tended to exacerbate it. Usefulness for insomnia and sleep-related disorders was reported by 33 (53%) respondents. Practitioners who prescribe for poor sleep invariably described it to be related to an over-active mind, obsessive or racing thoughts, worry and anxiety.

Other anxiety-related conditions given by practitioners as reasons for prescribing included for: ‘those who sigh a lot’, frustration, menopausal mood swings, despondency, neuralgia, nerve weakness, emotional instability, shock, feelings of not coping, tinnitus, debility, hot flashes triggered by stress, low mood, grand mal, Attention Deficit Hyperactivity

Disorder, Obsessive Compulsive Disorder, “liver heat rising” and to “relax constriction where there is heat”.

3.3. Duration of treatment

The survey respondents reported the herb as being used over a range of time periods from immediate short-term use to several years, with positive response expected to be experienced by the patient within the first two weeks and persisting throughout the period of use.

According to 8% (n = 5) of user respondents who did not state a timescale this is dependent on the health of a patient, the condition presented by a patient and its severity, how long they have been ill and patient compliance. In the words of one practitioner: ‘as long as it takes’. All other respondents gave a lower and/or an upper limit. Rarely, it may be prescribed as a one-off but in general the minimum length of time it is prescribed is for 1 or 2 weeks (11%; n = 6). At least 30% (n = 17) of user respondents consider prescribing it long-term (6 months or more), sometimes for years (9%; n = 5), although some stated ‘long term’ without being explicit about the timescale. Those who stated ‘several months’ were not included as long-term prescribers as it is unknown whether this could mean up to 6 months or more than 6 months. Of those who set an upper limit on treatment length 31% (n = 18) stated they would treat for up to 4 months. It is difficult to ascertain

average treatment length as many replies were not explicit. What is clear, however, is that it ranges from one-offs to several years.

3.4. Responses looked for in patients

Sleep quality was a major factor in assessing mental state improvement with 53% ($n = 30$) of *S. lateriflora* prescribers stating they would expect patients to sleep better; for example by sleeping longer, with less waking in the night, an ability to get to sleep and feeling refreshed in the morning. Many (37%; $n = 21$) felt they would be likely to notice that their patients were better able to cope with the stresses daily life. A reduction in anxiety and feeling calmer would be looked for in patients by 33% ($n = 19$) and 32% ($n = 18$) of practitioners respectively. In general, respondents expected their patients to feel happier, less depressed or tearful, calmer, more relaxed, less irritable, less stressed, tense or nervous and more in control of their emotions with elevated mood. They also expected a concomitant resolution or reduction of stress- and anxiety-related physical symptoms such as headaches, digestive disturbances, PMS, inflammatory skin conditions, twitches and spasms, and cardiovascular problems such as hypertension, tachycardia and palpitations.

3.5. Benefits reported by patients

The benefits most often reported by patients to their practitioners were feeling calmer, improved sleep patterns and sleep quality, and better able to cope in stressful situations. Other positive effects were mood elevation, increased energy, being more focused and feeling generally more relaxed. Some user respondents (19%; $n = 11$) answered that it is difficult to determine what patients have reported from using *S. lateriflora* as they never prescribed it as a single herb but always combined it with others.

3.6. Effectiveness response time

When asked: “after what length of time would you expect to see a response?” answers were again often implicit rather than explicit. Most provided a range of timescales e.g. “one to two weeks”. Some practitioners did not provide a minimum or maximum timescale, only ‘one month of treatment for every year they have been ill’ or ‘longer term’ and many responded to the question with ‘few days’ or ‘few weeks’. One said it was difficult to say as they always prescribe *S. lateriflora* in combination with other herbs and therefore values for neither the average nor minimum and maximum expected response time could be ascertained.

Most said it was dependent on the condition being treated and many said that improvement was time and/or dose dependent – practitioners’ own words but suggesting improvement over the minimum response time provided and/or with what they perceive as adequate doses (see Fig. 3) – but usually noticeable within a few days; and that continuation of treatment for periods beyond the first signs of improvement was beneficial to the patient. Responses by 12 practitioners suggest, however, that *S. lateriflora* may show an effect immediately or within hours. Twenty practitioners questioned expect to see some results in one or two weeks. Of total expected minimum response times provided ($n = 56$), only 11 practitioners did not expect *S. lateriflora* to show an effect before 3 weeks. The maximum expected response time was 12 weeks ($n = 2$) but, as practitioners are very keen to say: “it depends on the individual”.

3.7. Dosing strategies (posology)

The weekly ethanol: water tincture dose of *S. lateriflora* most commonly prescribed (Fig. 3) by user respondents is 20 ml (33.3%) followed by 30 ml (19%). As the average marc:menstruum ratio was 1:3 in 25% ethanolic extract the

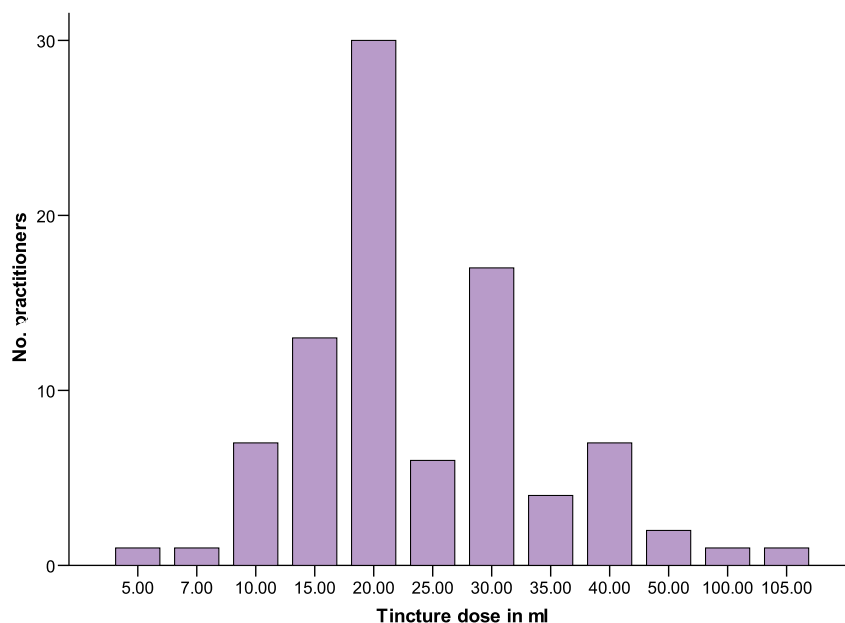


Fig. 3 – Most commonly administered weekly doses of ethanol:water *S. lateriflora* tincture.

most commonly prescribed weekly dose expressed as crude, dried herb was around 7 g and 10 g respectively. The range of doses represents approximately 1.7–35 g crude, dried or fresh herb in 1:3 ethanol:water (w/v) per week, and the median daily dose is thus 3 ml, which is equivalent to 1 mg at this marc to menstruum ratio. Tinctures are the preferred mode of administration by the majority (96%; n = 55) of respondents who prescribe the herb. The main reasons given were that tinctures are generally more convenient than dried herb and therefore better for patient adherence. There is also a belief that tinctures are more effective than dried herb. Tinctures may be made from either fresh or dried organic and non-organic herb and many user respondents (63%; n = 36) said they prefer to use organic *S. lateriflora* and 42% (n = 24) prefer tinctures made from the fresh herb, believing this to be the most effective.

All *S. lateriflora* users responding to the survey prescribe the herb in combination with other herbs. Only 9% (n = 5) regularly prescribed *S. lateriflora* as a single herb so it is difficult to draw conclusions about the perceived actions of *S. lateriflora* used on its own. Nevertheless the practitioners appeared to be confident in attributing specific anxiolytic and related actions and responses to *S. lateriflora* as distinct from other herbs in a mixture. Reasons for this are unclear but this perhaps reflect a combination of empirical, anecdotal and scientific knowledge relating to each of the herbs prescribed simultaneously. Furthermore, respondents (9% of users; n = 5) prescribing it as a single herb reported positive feedback from their patients such as reduced anxiety, fewer and less intense panic attacks, feeling of well-being, feeling more positive, more able to cope. Significantly, a relapse of anxiety symptoms in some patients was noticed by one practitioner prescribing the herb in combination with other (non-anxiolytic) herbs whenever it was removed from the mixture.

3.8. Contraindications and side-effects

Whilst the majority of respondents (81%; n = 50) did not consider *S. lateriflora* to be contraindicated for any conditions, the other 19% (n = 12) said they would not prescribe it to severely depressed patients, those with bipolar disorder or other specific mental conditions, to those with epilepsy, thyroid conditions, in pregnancy or to children. It may be possible that herbalists are unlikely to prescribe any herbs for situations where safety is unknown.

The herb was reported as being well tolerated and with only minor and infrequent side effects (reported by seven prescribers); including mild digestive upsets, worsening of depression, daytime drowsiness, light-headedness and vivid dreaming. It is uncertain whether any of these side effects could definitely be attributed to *S. lateriflora*. There were no reports of toxicity.

3.9. Survey response rate

It is not clear why there was such a low response rate to the survey questionnaire (despite two follow-ups, an oral presentation alert at a NIMH conference and an advertisement in a NIMH newsletter). Several reasons for low feedback could be postulated. One is that medical herbalists tend to receive a

number of survey response requests during any given year, mainly from undergraduates embarking upon their dissertations, and may therefore be suffering from 'survey fatigue'. It could be that some did not feel the survey was relevant to their practice if they were non-prescribers of *S. lateriflora*. This is difficult to assess but if this was the case then the ability to generalize across herbal medicine practitioners would have been affected by non-response bias (Cummings et al., 2001). Some may have been deterred by the length of the questionnaire and the fact that questions were in the main open-ended, requiring considerable time and effort on the part of already busy practitioners, many of whom are doing more than one job or are studying. Studies of response rates to surveys have demonstrated that the more user-friendly a survey is the more likely it is to have a high response rate (LaGarce and Kuhn, 1995). A fair amount of typing was required fully to answer the questions so it could not be considered to be as user-friendly as a quantitative scaling method, for example.

3.10. Conclusions

This study has added to the literature by showing that *S. lateriflora* is prescribed for a range of related conditions and its widespread use for sleep disorders has broadened the indications in the British Herbal Pharmacopoeia. Furthermore, the revelation that herbalists ascribe the action of a compound mixture to the herb has provided empirical evidence of its efficacy.

It is recognised that the response rate (16%) for this pilot survey was low and respondents include only those with access to email. It may therefore not be representative of all UK and Ireland herbal medicine practitioners. An advantage of email surveys is that they are fast and cost-effective and provide geographical diversity but excludes those without access to email. Furthermore, responses may have been mainly from those who have had experience of the herb. Non-respondents could possibly be mostly non-prescribers. Importantly, it is possible that those who do not prescribe *S. lateriflora* may not do so because they do not find the herb useful. Although this is speculation it could be a confounding factor. The poor response rate and the propensity of respondents to administer *S. lateriflora* in combination with other herbs make it impossible to rely on evidence regarding the efficacy of the herb from the pilot practitioner survey alone. A future survey could include herbal practitioners from other professional bodies such as the Council of Practitioners of Phytotherapy. In addition, contact with herbalists internationally may provide a more useful indication of the benefits of this herb. Because of the low response rate a future survey could contain fewer open questions and use a world-wide web electronic format so that respondents could have the option to simply click multiple choices with a computer mouse. Furthermore, it would be helpful to urge survey recipients to respond regardless of whether or not they use the herb.

Funding

This pilot survey was supported by The University of Westminster's Institute of Health and Wellbeing.

Acknowledgement

We are deeply indebted to the herbal practitioners who gave their valuable time to respond to the survey.

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