A reappraisal of herbal medicinal products

**In this article...**
- Similarities and differences between herbal and conventional medicine
- Why herbal medicines should be considered alongside conventional medicine
- How to advise patients on herbal medicine use

**Keywords:** Herbal medicines/Complementary and alternative medicine/THMPD

This article has been double-blind peer reviewed

---

**Authors** Sarah Edwards is research fellow, Centre for Pharmacognosy and Phytotherapy, School of Pharmacy, University College London; Ines Da-Costa-Rocha is research fellow, Centre for Pharmacognosy and Phytotherapy, School of Pharmacy, University College London; M Jayne Lawrence is chief scientific adviser, Royal Pharmaceutical Society, London; Colin Cable is pharmaceutical science information adviser, Royal Pharmaceutical Society, Edinburgh; Michael Heinrich is head of Centre for Pharmacognosy and Phytotherapy, School of Pharmacy, University College London.


Complementary and alternative medicine is increasingly popular, and encompasses a number of systems and therapies based on diverse theories and practices, such as homoeopathy, traditional herbalism, reiki, ayurvedic medicine and traditional Chinese medicine.

While many are based on metaphysical concepts for which there is no sound evidence, for herbal medicines there is a rational, scientific basis and increasing clinical evidence.

This article suggests herbal medicines should no longer be considered part of CAM, but instead sit alongside conventional medicines.

Herbal medicinal products (HMPs) are usually considered to belong to complementary and alternative medicine (CAM) – a catch-all phrase used to refer to any systems, practices, treatments or therapies that do not fall into accepted conventional medicine.

However, CAM is a culturally and socially constructed concept since notions of conventionality vary between cultures and over time. Conventional medicine in the UK is synonymous with “biomedicine” – medicine based on the principles of the natural sciences, including biology and biochemistry, while CAM includes diverse systems and therapies such as acupuncture, homeopathy, reiki and reflexology.

CAM is generally considered “holistic”, “natural”, and, it is inferred, safe. Its popularity is undeniable; each year an estimated 10% of the UK population received a CAM therapy (Thomas and Coleman, 2004). In 2003-04, $5bn was spent on herbal treatments alone in western Europe (World Health Organization, 2008). They are not used only by the “worried well”; a UK study, found 20% of cancer patients had used herbal medicines (Damery et al, 2011).

Patients often use CAM concomitantly with prescription medication, yet are unlikely to seek professional advice from or inform health professionals about this (Barraco et al, 2005); even if they do, few medical professionals are sufficiently familiar with CAM therapies.

To group all CAM systems and therapies together is misleading; while modern herbal medicine or phytotherapy has a

---

**5 key points**

1. Herbal medicinal products and food supplements are increasingly popular.
2. Herbal products are pharmacologically active and should be treated like conventional drugs, including the use of Yellow Card reporting.
3. Patients should be advised to use only licensed/registered herbal medicinal products.
4. They should be used only for self-limiting, minor diseases such as colds, or for the temporary relief of mild anxiety.
5. Patients should be advised not to use herbal medicines or food supplements while taking prescribed medicines, unless they are known to be safe together.

(1r): heart drug digoxin comes from foxgloves; galantamine in snowdrops is used to treat cognitive dysfunction; St John’s Wort is used for mild depression.
Drugs from natural sources

The scientific basis of modern pharmaceuticals is without question, yet many are based on natural products either as single compounds or synthetic derivatives.

Well-known examples include the use of quinine from cinchona bark to treat malaria, colchicine from crocus for gout, galantamine from snowdrop for cognitive dysfunction, and digoxin from foxglove in cardiac conditions. Aspirin and codeine also have their origins in natural products: aspirin was developed from compounds found in willow bark, while codeine and morphine are found in the latex of the opium poppy; another analgesic, diamorphine, is produced from morphine (Heinrich et al., 2012).

Plant-derived modern cancer treatments include the vinca alkaloids vinblastine and vincristine, obtained from the Madagascar periwinkle, and paclitaxel, from the Pacific yew. Artemisinin and its semi-synthetic derivatives, obtained from wormwood, are used to treat malaria (Heinrich et al., 2012).

In 2010, the Medicines and Healthcare products Regulatory Agency approved an oral-mucosal spray containing an extract of the cannabis plant for the treatment of spasticity due to multiple sclerosis. Cannabis extracts are also being developed as a potential treatment to alleviate cancer pain and neuropathic pain of various origins (Rog, 2010).

Herbal medicinal products

Herbal medicines (also known as herbal remedies, phytomedicines and phytotherapeutic products) are classed as medicinal products by the MHRA (2010). They can be made from whole plants, roots, aerial parts, leaves, fruits, flowers, seeds or plant extracts. Single compounds that are derived and purified from plants, or produced synthetically, are not defined as an HMP. Globally, between 40,000 and 50,000 plant species are used for medicinal purposes in both traditional and modern medical systems (Heywood, 2011); only a tiny minority have been assessed scientifically, although there is some evidence for the effectiveness of many.

While the clinical evidence available may differ from that for conventional medicines, for many commonly used herbal medicines there is now a sound basis of evidence. The main difference between herbal and conventional medicines is that herbal medicines each contain a large number of chemicals, rather than a single pharmacologically active substance. These chemicals consist of both primary metabolites (compounds intrinsic for the plants’ growth and reproduction), and secondary metabolites (organic molecules often used in plant defence against herbivores or pathogens). A principal tenet of modern herbal medicine is that this results in unique activity profiles, in which several compounds act on one another to moderate, oppose or enhance an effect.

An enhancement may be an additive or a “synergistic” action, whereby the combination of constituents is greater than would have been expected from the sum of individual contributions (Heinrich et al., 2012). For example, in the case of 

Aspirin was developed from compounds found in willow bark.

Ginkgo biloba L., it has been demonstrated that inhibition of platelet aggregation activity is greater for the total mixture of ginkgolides found in the herbal extract, than for the expected sum total of activity of individual compounds.

The term “polyvalence” describes the range of an extract’s biological activities that contribute to the overall observed clinical effects, whereas synergism applies to only one pharmacological function. For example, St John’s Wort (Hypericum perforatum L), which is used to treat mild to moderate depression, contains a variety of compounds including hyperforin, which has been shown to inhibit serotonin re-uptake, and hypericin, which inhibits binding to some subtypes of dopamine receptors (Houghton, 2009).

The difference between herbal medicines and conventional medicines, however, is reducing, since the “one target, one disease” concept is increasingly considered inadequate in many clinical situations (Wermuth, 2004). Consequently, the practice of polypharmacy, whereby multiple drugs are used to treat serious conditions such as cancer or HIV infection, is now commonplace (Houghton, 2009).

The use of multiple drugs increases the risk of adverse effects and drug interactions, whether synergistic or antagonistic (when the combined effect is less than the expected effect of the drugs used on their own). This problem is becoming more recognised, especially in older people. Use of over-the-counter (OTC) herbal medicines and food supplements among older people is also common. While HMPs and food supplements are generally not included in standard definitions of polypharmacy, it is known that they can increase the risk for drug interactions (Maggiore et al, 2010).

The chemical make-up of individual plants is strongly influenced by a combination of genetic and environmental factors (including soil, weather, shade, season or time of day harvested, and any pesticides, herbicides or fertilisers used). Processing and extraction procedures will also affect the final chemical composition of an HMP. This explains why the chemical profile of two HMPs derived from the same plant species may differ considerably. Raw and processed materials require monitoring using well-developed analytical techniques to produce HMPs of consistent quality.

The Traditional Herbal Medicinal Products Directive (THMPD), which came into force in 2004 with a seven-year transitional period, stipulates that only registered products may be sold as OTC herbal medicines. Products obtaining a traditional herbal registration (THR) have known quality and safety, and documented traditional use. Only limited therapeutic claims can be made, and their use is generally for minor self-limiting conditions using oral, inhaled

www.nursingtimes.net / Vol 108 No 39 / Nursing Times 25.09.12 25

“Your patients need your kindness as much as your clinical expertise”

Katie Scales p28
### Table 1. Examples of Commonly Used Herbal Medicines

<table>
<thead>
<tr>
<th>Common name(s)</th>
<th>Scientific name(s) [plant part used]</th>
<th>Indications</th>
<th>Contraindications</th>
<th>Known interactions</th>
<th>Adverse effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Echinacea, coneflower</strong></td>
<td>Echinacea angustifolia DC, <em>E.</em> pallida (Nutt) Nutt, <em>E.</em> purpurea (L) Moench [aerial parts and roots]</td>
<td>Common cold, influenza and other upper respiratory tract infections; minor skin conditions (<em>E.</em> angustifolia). Note: Echinacea products are highly variable in composition and quality, due to different chemical profiles of plant parts/species used.</td>
<td>Pregnancy and lactation due to lack of safety data. Hypersensitivity to plants from Asteraceae (Compositae/daisy family). Should be avoided in cases of progressive systemic disorders such as tuberculosis, leukaemia, collagen disorders, multiple sclerosis and other autoimmune disorders, due to immunomodulatory activity. Long-term use (&gt;8 weeks) should be avoided because there is a lack of safety data and it may increase potential for immunosuppression.</td>
<td>None known, but possible interaction with immune suppressants (for example ciclosporin and methotrexate), cancer chemotherapy, warfarin and chlorpromazine.</td>
<td>Allergic reactions. Isolated reports of skin rashes/itching. Rare side-effects include facial swelling, difficulty in breathing, dizziness and reduction in blood pressure (Barnes et al, 2005; MHRA, 2012a).</td>
</tr>
<tr>
<td><strong>Milk thistle</strong></td>
<td><em>Silybum marianum</em> (L) Gaertn [seeds]</td>
<td>Used to relieve symptoms associated with occasional overindulgence of food and drink, such as indigestion and upset stomach. Used as liver protectant, and to treat hepatitis and alcoholic cirrhosis. Used to reduce effects of poisoning by fungi of the genus <em>Amanita</em>.</td>
<td>Pregnancy and lactation due to lack of safety data. Hypersensitivity to milk thistle or other plants from Asteraceae (Compositae/daisy family). Not recommended for children under 18 years of age. Patients with active liver disease should first consult a doctor.</td>
<td>None known. Theoretically may affect the way that other drugs are broken down by the liver. Long-term use of milk thistle should be avoided due to lack of long-term safety data.</td>
<td>Gastrointestinal reactions (nausea, diarrhoea); headache, allergic reactions (urticaria, skin rash, anaphylaxis). Frequency unknown (Heinrich et al, 2012; MHRA, 2012b).</td>
</tr>
<tr>
<td><strong>Saw palmetto</strong></td>
<td><em>Serenoa repens</em> (W Bartram Small) [fruit]</td>
<td>Lower urinary tract symptoms in men, with confirmed diagnosis of benign prostatic hyperplasia.</td>
<td>Although considered safe, other serious conditions should be ruled out before treatment. Avoid in suspected prostate cancer to prevent masking symptoms. Hypersensitivity to saw palmetto. Not indicated for women or under-18s. Use of saw palmetto should be discontinued and platelet function assessed before surgery.</td>
<td>None known.</td>
<td>One case report of intraoperative haemorrhage associated with saw palmetto. Rare side-effects include gastrointestinal discomfort and allergic reactions (MHRA, 2012b).</td>
</tr>
<tr>
<td><strong>St John’s wort</strong></td>
<td><em>Hypericum perforatum</em> [aerial parts]</td>
<td>Low mood, mild anxiety, seasonal affective disorder</td>
<td>Not recommended for use in under-18s. During pregnancy and lactation, hypersensitivity to St John’s wort. Patients with known dermatological sensitivity or undergoing phototherapy or photodiagnostic procedures.</td>
<td>High potential of interaction as induces cytochrome <em>CYP450</em> isoenzymes and transport protein P glycoprotein. Should not be used with anticoagulants (for example warfarin), oral contraceptives, HRT, epilepsy medications, immune suppressants, digoxin, opiates, antineoplastic, protease inhibitors, fexofenadine, statins, omeprazole, verapamil and other antidepressants.</td>
<td>Despite interaction potential, it has a good safety profile. Possible side-effects include gastrointestinal discomfort, fatigue and restlessness, allergic skin reactions. Sunburn-like reactions on skin exposed to strong UV irradiation, particularly in fair-skinned individuals. Other reported side-effects include headaches, anxiety, nerve pain, dizziness and mania (Heinrich et al, 2012; MHRA, 2012b).</td>
</tr>
<tr>
<td><strong>Valerian</strong></td>
<td><em>Valeriana officinalis</em> [root]</td>
<td>Insomnia, stress and anxiety</td>
<td>Hypersensitivity to valerian. Pregnancy and lactation due to lack of safety data. Not recommended in under-18s due to lack of safety data. Should not be taken up to two hours before driving or operating machinery; the effects may be enhanced by alcohol consumption.</td>
<td>No clinical reports involving interactions with sedatives. Theoretically, may potentiate effects of barbiturates and chlorpromazine.</td>
<td>Gastrointestinal symptoms (nausea, abdominal cramps) may occur after ingesting, but frequency unknown. Isolated reports of hepatotoxicity associated with valerian-containing products, but causality not established (Heinrich et al, 2012; MHRA, 2012a).</td>
</tr>
</tbody>
</table>
and topical formulations. They must be sold with a patient information leaflet. They can be identified by a THR number and may also display a certification mark (which is not compulsory) on the packaging.

The implementation of the THMPD has resolved a number of safety issues surrounding the production of unregulated HMPs, by ensuring consistent quality and safety based on good manufacturing, agricultural and/or collection practices. These all aim to eliminate the risk of safety issues caused by:

- Contamination (for example, with heavy metals, pesticides, or moulds);
- Substitution (for example, with synthetic drugs such as corticosteroids);
- Adulteration (either accidental or deliberate adulteration with other species).

A few potentially dangerous medicinal plants remain restricted to use as prescription-only medicines, including digitalis, strychnos and aconitin, with maximum doses and/or route of administration specified. Some herbal ingredients are prohibited, including Aristolochia species, which are highly nephrotoxic (Heinrich et al., 2009).

Patients who use unlicensed herbal products have no guarantee that these comply with regulations, so may be exposing themselves to the risks highlighted above.

The MHRA’s Yellow Card scheme for pharmacovigilance applies to registered HMPs as well as to conventional medicines, and should be used where there is concern that an adverse event or interaction has occurred as a result of their use. As with conventional medicines, there is a general lack of safety data on the use of HMPs in some groups for whom caution should prevail, including young children and pregnant or breastfeeding women (Cuzzolin et al., 2011; Lim et al., 2011).

Food supplements

A vast number of medicinal plants are also used as foods or cosmetics. The MHRA is responsible for classifying which herbal products are primarily medicines and therefore fall within regulations for HMPs (MHRA, 2007); those classified as food supplements must comply with Food Standards Agency regulations (2010).

Food supplements may be almost indiscernible from HMPs in terms of their physiological effects on the body, but must not be sold with any therapeutic claims (MHRA, 2007).

Food supplements are usually sold as OTC products and displayed by retailers along with HMPs (in fact the same herb may be sold as both a food supplement and an HMP). Like HMPs, food supplements may have the potential for interaction with other medications; for example, garlic, ginseng and ginkgo all increase the risk of bleeding associated with anti-platelet and anticoagulant agents such as aspirin and warfarin (Williamson, 2009).

Medical devices

Some herbal products may be registered with the MHRA as medical devices. For example a “fibre complex” from stems of the prickly pear cactus (Opuntia ficus-indica), has been registered as a medical device for weight loss; a small number of adverse drug reactions have been reported for it (MHRA, 2012a).

Conclusion

Registered OTC HMPs fulfil a useful role for members of the public who wish to take responsibility for their own healthcare, although self-selection requires an element of caution.

Nurses need to be able to give balanced advice to patients who use these products, especially if they are to be used alongside prescribed medicines. While registered/licensed HMPs are normally safe for the consumer if used in accordance with the provided manufacturers’ safety information, there is also a need to raise awareness in the general public about the potential dangers associated with the purchase of unregulated herbal products.

Safety advice on herbal medicines can be found on the MHRA’s website (www.mhra.gov.uk), including Public Assessment Reports for registered traditional herbal medicines. Nurses with online subscription access to MedicinesComplete (www.medicinescomplete.com), can also find detailed reference material on popular herbal medicines (Herbal Medicines section), and herb-drug interactions (Stockley’s Herbal Medicines Interactions).

Based on the existing scientific evidence and stringent quality regulations, registered/licensed HMPs are not part of CAM: they are pharmacologically active medicines and need to be treated similarly to conventional medicines, requiring a paradigm shift by health professionals.

References


Quinine extracted from cinchona bark has been used to treat malaria


