CHAPTER 21

Herbal Remedy: Safe or Not Safe? How to Use Them?

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INTRODUCTION

Over the years, herbals have gained popularity in the Western world as a potential alternative to contemporary medicine. With its use, patients do not think to report or list their herbals as potential medication to their physicians, pharmacists, and healthcare providers. Being used as medication to treat different types of illnesses in
traditional medicine, one would think that these products will also carry with them a danger of side effects, toxicity, and interactions with other medication if used in excess or not under supervision of an expert in traditional medicine.

Numerous reports on herbal side effects were reported. Therefore, we would like to explore the various factors that need to be discussed in the realm of herbal usage and its safety.

First of all, herbal safety depends on the product itself, its manufacturer, and its conditions during the culture, the harvest, the production, the storage, and its distribution. Second, herbals contain several types of chemical components that traditional medicine has learned how to use judiciously to arrive at the final result. The conditions can influence factors such as content and the quality of the ingredients of the plant. This could explain the variety of potency and/or therapeutic effects of certain plants.

The following paragraphs will try to present the above-named factors of this potential contribution of traditional medicine to the contemporary treatment of illnesses.

**THE QUALITY**

The quality includes the following factors:

1. Habitats:
   a. Tame versus wild plants (wild blackberries), “nature intended,” sun (ginseng, fur), rain (water-soluble substances), and quality of the soil (*Atropa belladonna*)
2. Harvesting conditions:
   a. Dry (flowers, seeds, barks best in spring with exceptions such as wild cherry bark in autumn), before the plant blossoms (leaves), ripeness (fruits)
3. Parts of the plant (harvest time):
   a. Barks exposed: spring
   b. Root barks: almost any time of the year
   c. Whole root: in June as long as we can see the dead top; ginseng in July
   d. Entire herb, leaves, and flowers: July, August, and September (bloom starts)
4. Drying and storage:
   a. Herbs, leaves, and flowers: dry in the shade to avoid loss of activity
   b. Large root: to be cut to ensure drying
   c. Storage: dry and low temperature

**PLANT PARTS**

Plant parts include the following:

1. Barks: portion of the woody exogenous stem or root
   • Measurements, external color, markings, fractures, color
2. Woods: part of the woody exogenous stem or root that lies inside the cambium ring
• Sapwood: still functions in the vegetative process of the plant
• Heartwood: no more function in the transportation of sap
• External surfaces: fiber or porous
• External colors: variable
• Fracture: tough and fibrous
• Internal color: same as external color

3. Leaves and flowers:
   • Size, shape, external marking, the feel, color, fracture (usually no importance for the identification)

4. Fruits and seeds:
   • Shape, marking, colors, fracture (no great importance)

5. Odor and taste:
   • Odor: depends on the amount of volatile constituents (aromatic, balsamic, spicy, alliaceus, camphoraceous…)
   • Taste: the quality or flavor of the substance perceived
     • True taste: acid, sour, saline, saccharine, alkaline, bitter
     • Tasteless: insoluble in the saliva
     • Imparting a sensation to the tongue: mucilagenous, oily, astringent, pungent, acid, nauseous.

PLANT SECONDARY METABOLITES

Secondary Metabolites

These substances that are commonly of limited molecular weight of <3,000 Da. Secondary metabolites are not waste or detoxification products, “ballast,” reservoir of potential future properties, for the function of primary metabolism, or just waiting to become functional at some point in life. Secondary metabolites existed for the survival of the plants and possess specific physiological responses dependent on structure-receptor fitness.

Molecular Basis

These are traditionally similar in their structures (and biosynthesis) or based on their biological functions:

• DNA-binding antibiotic (i.e., bleomycins with specific action to cleave DNA)
• Alkylating and crosslinking DNA (e.g., mitomycin C)
• Bacterial cell wall synthesis (e.g., penicillin, vancomycin)

Types of Secondary Metabolites

The plants can possess the secondary metabolites that have physiological effects on the body systems (e.g., adrenal glands and lipids), or the secondary metabolites can also act as a medication with its side effects.
STRESS COMPOUNDS

Stress compounds are products of either primary or secondary metabolism. Accumulation in plants in a concentration higher than normal, secondary to injury or insult to the plant metabolism:

- Mechanical wounding
- UV rays
- Dehydration
- Chemicals
- Infection

Their Roles?

Stress compounds can be potential pharmaceutical compounds (e.g., phytoalexins as antifungal) or toxicity.

Types

Their types include phenols, resins, carbohydrates, hydroxycinnamic acid derivatives, coumarins, and steroidal compounds.

RECOMMENDATIONS FOR HERBAL USAGE

One should consider herbals as a medication for the following reasons:

- Its excessive use might lead to toxicity (e.g., in Western medicine, acetaminophen known as Tylenol is a popular over-the-counter drug and has been reported as unsafe by the government because cases of liver failure were reported with excessive doses of the medication).
- Patients might want to seek advices or recommendations from a certified expert in this new modality of treatment.
- Products should be from a reputable manufacture company with all the ingredients listed as complete similarly to the listing of Western medicine.
- Any herbal usage will need to be reported or discussed with your physician or pharmacist or other healthcare providers.
**Setup for an Herb-Drug Interaction to Occur**

The following can lead to an herb-drug interaction:

- Herbal products usage not mentioned to the physician
- Easily accessible
- No mechanism of controlling, surveillance, and reporting the event
- Lack of education to the public and the healthcare practitioners

**Common Herbal Drug Interactions**

Common herb-drug interactions include the following:

1. **Chamomile**
   - Mild sedation, antispasmodic, antiseptic
   - Anaphylactic reaction with cross-allergy with ragweed
   - Anticoagulant effect

2. **Echinacea**
   - Anti-infective with immunologic active polysaccharides
   - Possible hepatotoxicity

3. **Feverfew**
   - Migraine
   - Cross-allergy with ragweed, chamomile, yarrow
   - Antiplatelet activity
   - Post-feverfew syndrome

4. **Garlic**
   - Antispasmodic, antiseptic, antiviral, promotion of leukocytosis
   - Antihypertension
   - Antihypercholesterolemia

5. **Ginger**
   - Antinausea and antispasmodic agent
   - Prolong bleeding time

6. **Ginkgo**
   - Free radical scavenger
   - Spontaneous bilateral subdural hematoma
   - May decrease the effectiveness of oral anticonvulsants

7. **Ginseng**
   - Interfere with digoxin assay
   - Increase adrenal steroid genesis
   - Immune modulatory effects in mice
   - Hypoglycemic agent
   - Hypertension, insomnia, headache, vomiting, epistaxis
   - Antiplatelet effect
   - Avoid in patient with manic-depressive disorders

8. **St. John’s Wort**
   - Diuretic, urinary antiseptic
   - Benign prostate hypertrophy
Table 21.1 A Summary of the Most Common Herb Usage and Their Clinical Implications

<table>
<thead>
<tr>
<th>Herbs</th>
<th>Uses</th>
<th>Administration</th>
<th>Adverse drug reaction</th>
<th>Clinical issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aloe</td>
<td>Burn, sunburn, moisturizer, laxative, general healing</td>
<td>Gel, juice</td>
<td>Contact dermatitis, intestinal cramping</td>
<td>Delay wound healing, loss of GI potassium; not recommended during pregnancy</td>
</tr>
<tr>
<td>Bilberry</td>
<td>Cataract, macular degeneration, diabetic retinopathy</td>
<td>20–40 mg orally three times a day (as anthocyanidin)</td>
<td>None reported</td>
<td>Inhibits platelet aggregation, lower blood glucose</td>
</tr>
<tr>
<td>Cayenne</td>
<td>Pain (shingles, headache, diabetic neuropathy, osteo-rheumatoid arthritis; thermogenesis, stomach protectant)</td>
<td>0.025–0.075% capsaicin four times a day, Diet</td>
<td>Local burning, stomach upset, diarrhea</td>
<td>Reduce platelet aggregation, increase fibrinolytic activity, remove cayenne from hands with vinegar</td>
</tr>
<tr>
<td>Chamomile</td>
<td>Antispasmodic, sedative, anti-inflammatory</td>
<td>Tea (fresh or dried orally, 3–4 cups daily), compress</td>
<td>Hypersensitivity, GI upset</td>
<td>Delayed effect, may reduce drug absorption</td>
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<tr>
<td>Dong Quai</td>
<td>Amenorrhea, dysmenorrhea, menopause</td>
<td>Powdered root or tea: orally, 1–2 g; tincture (1:5): 1 teaspoon; fluid extract: 1 ml</td>
<td>Sunburn, reduce blood pressure, CNS stimulation</td>
<td>Phototoxic, inhibit platelet aggregation, ? synergism with calcium channel blocker</td>
</tr>
<tr>
<td>Echinacea</td>
<td>Viral, bacteria, candida infection (upper respiratory infection, urinary tract infections, snake bite)</td>
<td>Fluid extract: orally (1:1), 1–2 ml three times a day; solid extract: (6.5:1), 300 mg</td>
<td>Tingling sensation on tongue, fever from freshly pressed juice, cross sensitivity with sunflower seeds</td>
<td>Avoid in patient with autoimmune diseases (lupus, rheumatoid arthritis, leukemia)</td>
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<td>Feverfew</td>
<td>Prophylaxis migraine headache, relieves fever, arthritis</td>
<td>Dry powdered orally, leaf cap 25–100 mg daily or 2–3 leaves daily</td>
<td>Aphthous ulcer from chewing leaves</td>
<td>Reduce platelet aggregation, increase fibrinolytic activity, uterine stimulant (avoid in pregnancy), not for children &lt;2 years of age, delayed effect (4–6 months)</td>
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<tr>
<td>Garlic</td>
<td>Broad-spectrum antimicrobial, lower blood pressure, cholesterol</td>
<td>10 mg of allin, or one clove of fresh garlic orally daily</td>
<td>GI irritation</td>
<td>Inhibits platelet aggregation and increases fibrinolytic activity, increase insulin production</td>
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<tr>
<td>HERBAL REMEDY</td>
<td>Motion, morning sickness, postoperative nausea, arthritis, migraine headache, muscular pain</td>
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<tr>
<td>Ginger</td>
<td>Powdered ginger root: nausea/vomiting (N/V) 250 mg orally four times a day; arthritis, 125–1,000 mg four times a day</td>
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<td>GI upset (&gt;6 g daily)</td>
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<td></td>
<td>Inhibits platelet aggregation, may decrease calcium channel blocker effect</td>
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<td>Ginkgo</td>
<td>Vascular deficiency, diabetic retinopathy</td>
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<td></td>
<td>40 mg three to four times orally leaf extract</td>
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<td></td>
<td>GI discomfort, headache</td>
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<td></td>
<td>Take 2–3 weeks for response, 12 weeks for positive</td>
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<tr>
<td>Ginseng</td>
<td>Adaptogen, antistress, antifatigue, regulate blood pressure, menopausal symptoms</td>
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<td>(Chinese, Korean, American)</td>
<td>10 mg of ginsenoside, orally three times a day</td>
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<td></td>
<td>Nervousness, breast tenderness, low toxicity profile</td>
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<td></td>
<td>Reduce platelet aggregation, reduce blood sugar, high dose may reduce the immune system in early stage of infection 2 weeks on and 2 weeks off, avoid during pregnancy</td>
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<tr>
<td>Ginseng</td>
<td>Same, with reduce anginal symptoms, immune system booster</td>
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<tr>
<td>(Siberian)</td>
<td>Fluid extract: 2–4 ml once three times per day; solid extract: 100–200 mg daily</td>
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<td></td>
<td>Insomnia with high dose, irritability, anxiety, diarrhea, headache, hypertension, pericardial pain</td>
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<td>Estrogenic effect, not to use during pregnancy, avoid in manic-depressive condition</td>
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<tr>
<td>Goldenseal</td>
<td>Bacterial, fungal infection of mucous membrane, GI infection with diarrhea, cirrhosis, inflamed gallbladder, eye infection</td>
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<td>250–500 mg orally three times a day</td>
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<td>N/V, CNS stimulant, interfere with GI vitamin B manufacture</td>
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<td></td>
<td>Hypoglycemic effect, prophylactic use for traveler’s diarrhea (1 week before and 1 week after), do not exceed 2 months usage at a time, not during pregnancy</td>
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<tr>
<td>Hawthorn</td>
<td>Atherosclerosis, HTN, angina, congestive heart failure, rheumatoid arthritis, periodontal disease</td>
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<td></td>
<td>Fluid extract (1:1) orally: 1–2 ml three times a day; freeze-dried hawthorn berries, 1–1.5 g</td>
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<td></td>
<td>High dose may induce hypotension and sedation</td>
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<td></td>
<td>Inhibit angiotension-converting enzyme, potentiate cardiac glycosides, increase use of vitamin C, do not discontinue abruptly</td>
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<tr>
<td>LaPacho</td>
<td>Bacterial, viral, fungal, and parasitic infection, intestinal and vaginal candidiasian</td>
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<td></td>
<td>Tea or extract: orally 1.5–2 g daily</td>
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<tr>
<td></td>
<td>None reported yet</td>
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<tr>
<td>Herbs</td>
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<tr>
<td>Licorice</td>
<td>Antiviral for cold and herpes simplex virus-1, premenstrual syndrome, Addison's disease, inflammation, allergy, peptic ulcer disease (PUD), eczema, canker sore, herpes simplex virus</td>
<td>Fluid extract: orally (1:1): 2–4 ml; solid extract: orally (4:1): 250–500 mg; PUD: orally 2–4 380 mg chewable tablet for 30 min before meals</td>
<td>Aldosterone-like adverse effect with &gt;100 mg daily for &gt;6 weeks, lethargy to quadriplegia</td>
<td>Avoid in hypertension, renal, liver failure, current cardiac glycosides therapy, potentiate steroids therapy</td>
</tr>
<tr>
<td>Milk thistle</td>
<td>Cirrhosis, chronic hepatitis, gallstone, liver protection from toxins</td>
<td>140 mg orally of silymarin three times a day</td>
<td>Loose stool; mild allergic reaction</td>
<td>Take Metamucil, oat bran to prevent loose stool</td>
</tr>
<tr>
<td>St. John's Wort</td>
<td>Mild to moderate depression</td>
<td>300 mg orally three times a day with 0.3% hypericin extract, with meals</td>
<td>Possibility of photosensitivity</td>
<td>Avoid selective serotonin reuptake inhibitor, food, or drugs interacting with monoamine oxidase inhibitor</td>
</tr>
<tr>
<td>Saw palmetto</td>
<td>Benign prostate hypertrophy</td>
<td>160 mg orally twice a day</td>
<td>Low profile, headache</td>
<td>Result in 4–6 weeks, no effects on prostate-specific antigen, estrogen effects, avoid in pregnancy and in breast cancer</td>
</tr>
<tr>
<td>Valerian</td>
<td>Sedative, anxiety, stress</td>
<td>150–300 mg extract orally 30–45 min before bedtime</td>
<td>Headache, excitability, rare morning drowsiness, cardiac disturbances</td>
<td>May potentiate other CNS depressants, reduce daytime naps and caffeine intake, increase exercise to increase results</td>
</tr>
</tbody>
</table>
9. Valerian
   • Mild hypnotic
   • Do not combine with sedatives/barbiturates.

REPUTABLE MANUFACTURERS

Nature’s Way, Solaray, Enzymatic Therapy, Phyto-Pharmica, Electric Institute, Usana are some reputable manufacturers. It is important to buy standardized products, labeled with the botanical name.

SUMMARY

Table 21.1 shows a summary of the most common herb usage and their clinical implications.

FURTHER READING