The Millennium of Chinese Herbal Medicine? But Safety First!

by Edzard Ernst

Introduction

Chinese Herbal Medicine (CHM) seems to have conquered the world and increasingly fascinates healthcare providers and researchers in the West. Around 300,000 practitioners of CHM practise in over 140 countries worldwide. In view of this stunning success, some enthusiasts believe that the 21st century will be “the century of CHM.”

This high level of popularity has complex reasons. In Asia, CHM is in widespread use mostly because it represents the medical tradition that has served the region for millennia. The increasing popularity in the West is, to many observers, more puzzling and must be seen in the context of the public’s current romance with all things alternative. The United States data, for instance, show that, between 1990 and 1997, the proportion of the general population using “alternative” medicine has increased from 33% to 42%. In Germany, the figure even stands at 75%! The reasons for this surge are diverse and range from a disenchantment with conventional medicine to the hope of being cured without side-effects.

Given its increasing popularity and the widespread assumption of absence of risk, it is timely and necessary to ask, is CHM truly safe? This is obviously a complex question which requires a more in-depth review than is possible with this short article. Nevertheless, I will try to touch upon some of the most pertinent issues with a view to alerting the reader to potential problems.

Toxicity of Herbal Ingredients

CHMs contain numerous pharmacologically active substances. Synergy is often assumed to play a part in the medicinal effects of single plant extracts. Similarly, it is also claimed that combinations of herbs, typically used for CHM, have synergistic effects. There is some in vitro and in vivo evidence to support the occurrence of synergism between constituents in certain herbal extracts. However, direct clinical evidence is largely lacking. The claim of synergy also includes the attenuation of undesirable effects, i.e. the toxicity of plant extracts is less than that of a single isolated constituent. Theoretically, the opposite could also be the case: different plant constituents could interact with each other to render a herbal preparation more toxic than a single chemical constituent. Virtually no evidence is available to substantiate either hypothesis. The toxicity of herbal ingredients used in CHM cannot be fully reviewed in this short article. Instead,
Table 1 provides examples of relatively well-documented toxicity. The often-voiced notion that any treatment which has stood the test of millennia of use is not infallible.

**Contamination/Adulteration**

CHMs have repeatedly been associated with heavy metals. Several possibilities exist to explain the presence of heavy metals in CHMs. First, heavy metals could be included intentionally for medicinal properties. Mercury, for instance, is part of some preparations under the term of *cinnabar* (mercury sulfide) or *calomelas* (mercury chloride). Lead is used as *mi tuo seng* (lithargyrum) and arsenic as *xiong huang* (Realgar) in the manufacture of some CHMs.

Second, the presence of heavy metals may be the result of accidental contamination during manufacture, for instance, from grinding weights or lead-releasing containers or other manufacturing utensils. Third, medicinal herbs may contain heavy metals when grown in seriously polluted soil. In this context, it is relevant to note that CHMs may also contain animal and mineral products and that these may also be contaminated with heavy metals.

Heavy metal poisoning through CHM use has been reported with some regularity. Moreover, epidemiologic and analytical investigations suggest that a considerable proportion of CHMs contains heavy metals, resulting in severe clinical consequences and even fatalities. Other potential contaminants of CHMs include toxic botanicals, microorganisms, microbial toxins, pesticides and fumigation agent.

Several instances are on record where CHMs have been adulterated with synthetic medications. The lists of ingredients thus identified is long and includes drugs with potentially life-threatening effects such as oral anti-diabetic medications.

**CHM-Drug Interactions**

Interaction can be either pharmacodynamic or pharmacokinetic by nature. In the former case, both interacting medicines typically have the same pharmacological effects; the result of their combined use would be an exaggerated clinical response. In the latter case, one medicine interferes with the absorption, distribution, metabolism or excretion of the other; the result would be an exaggeration or diminution of the clinical response.

Most of the documented interactions concern those with anticoagulants (drugs for preventing blood clots). The reason might be that anticoagulated patients are closely monitored. Interactions affecting other physiological functions might remain unnoticed simply because no monitoring is in place.

**Comment**

CHM is clearly popular and this popularity demands vigilance about potential adverse effects. Because systematic research is in its infancy, our current knowledge is largely based on anecdote rather than hard data. As such it is inconclusive and provides mere suggestions, not proof.

The ultimate issue question relating to CHM is not safety alone but can be encapsulated in the all-deciding question, “Does CHM generate more good than harm?” To find the answers, we urgently need systematic research into both the efficacy and the safety of CHM.
But calling for research is easy — conducting it is not. Perhaps the two biggest obstacles are firstly the notorious lack of funds — there is no patent protection and consequently little commercial interest in investing into research. Secondly, and perhaps even more importantly, the CHM sector generally lacks a strong tradition of science. Provocatively, one could even say that many players in this field are profoundly opposed to applying the rules of science to CHM. It is my view that, if the 21st century should become the century of CHM, this attitude must change.

Table 1. Examples of Herbs with Documented Toxicity Used in CHM.

<table>
<thead>
<tr>
<th>Name</th>
<th>Toxic Ingredients</th>
<th>Adverse Effect</th>
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<tbody>
<tr>
<td>Aconite</td>
<td>Cardiotoxic alkaloids, e.g. aconitine</td>
<td>Heart failure (other symptoms of aconite poisoning include numbing of mouth and tongue, gastrointestinal problems, muscular weakness, vertigo)</td>
</tr>
<tr>
<td>Aristolochia</td>
<td>Aristolochic acid</td>
<td>Nephrosis, cancer</td>
</tr>
<tr>
<td>Ephedra (Ma Huang)</td>
<td>Ephedrine</td>
<td>Adrenergic effects (e.g. insomnia, tachycardia, myocardial infarction, stroke)</td>
</tr>
<tr>
<td>Ginseng (Panax)</td>
<td>Ginsenosides</td>
<td>Hypertension, headache, oedema, diarrhoea, insomnia, depression, amenorrhoea</td>
</tr>
<tr>
<td>Licorice</td>
<td>Glycyrrhrzinic acid</td>
<td>Mineral corticoid action (e.g. hypertension, muscle weakness)</td>
</tr>
<tr>
<td>Danshen</td>
<td>Coumarines</td>
<td>Bleeding, potentiation of concomitant anti-coagulant therapy</td>
</tr>
<tr>
<td>Jin Bu</td>
<td>L-tetrahydropalmatine</td>
<td>Vertigo, fatigue, nausea, drowsiness, bradycardia, hepatitis</td>
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About the Author

Professor Edzard Ernst qualified as a physician in Germany where he also completed his MD and PhD theses. He was Professor in Physical Medicine and Rehabilitation (PMR) at Hannover Medical School (Germany) and Head of the PMR Department at the University of Vienna (Austria). He came to the University of Exeter in 1993 to establish the first Chair in Complementary Medicine.

Professor Ernst is Founder/Editor-in-Chief of two medical journals [Focus on Alternative and Complementary Therapies (FACT) and Perfusion]. His work has been awarded with eight scientific prizes. He serves on the Medicines Commission of the British Medicines Control Agency and on the Scientific Committee on Herbal Medicinal Products of the Irish Medicines Board. In 1999 he took British nationality.

Publications: More than 1000 papers (about 300 primary research articles) and 32 books (translated into five languages). Several hundred invited international lectures. Supervision of approximately 50 MD or PhD theses.

Contact Details:

Professor Edzard Ernst
Address: Complementary Medicine, Peninsula Medical School
         Universities of Exeter & Plymouth
         25 Victoria Park Road, Exeter, Devon EX2 4NT, England
Tel: +44 1392 430802
Fax: +44 1392 427562
Email: Edzard.Ernst@pms.ac.uk
URL: www.exeter.ac.uk/sshs/compmed/