

Pharmacology and Toxicity of Commonly Used Herbal Formulas

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There are 2 main methods used in the study of herbal pharmacology.

1. Western pharmacological methods do research on the herb's chemical components and their mechanism of action.
2. Traditional Chinese Medicine (TCM) utilizes established interactions between herbs. *For example* formula Bu Zhong Yi Qi Tang is used for deficiency of spleen qi and prolapsed stomach. If either one herb Chai Hu or Sheng Ma is used in the formula, no effects result. But when Chai Hu and Sheng Ma are used together, the formula has a strong effect on the condition. Traditional Chinese Medicine down through its history has discovered the value of both individual action plus the interaction of herbs. Increasingly, studies make use of terminology from both Traditional Chinese Medicine and western medicine to facilitate a common understanding of Chinese herbal medicine.

Toxicity

There are two main acute toxicity tests used in the study of herbal medicine.

1. **LD50** is the determination of lethal dose where half of the number of animals in the study die. The minimum time period used is 7 days. This is a reliable standard toxicity test in herbal pharmacology.
2. **MTD - Maximum Tolerance Dose**

Many single herbs and formulas with no toxic effect on the system have no LD50. MTD is the maximum tolerance dose. It is used to determine the largest dose possible before one death occurs in the test animals. The minimum test period is 7 days. This test also can be used to find the range between actual therapeutic dose and maximum dose, i.e.) G035 - the MTD is 360 times larger than the actual therapeutic dose. Therefore, this is a very safe formula to use for menopausal syndromes. Many single herbs and formulas are very safe with no toxic effect on the system, no LD50.

TCM also uses the Long Term Toxicity Test. Its purpose is to observe symptoms, herbal actions and toxicity after prolonged treatment. It can also help to determine a safe dosage for long term use. Once the treatment is stopped, observations are made as to any recovery of tissue or organs.

The length of the Long Term Toxicity Test varies. If treatment requires 1 week, the test will require two weeks. If treatment requires 2 weeks, the test will require 4 weeks. Essentially, the Long Term Toxicity Test requires double the treatment time.

Lastly, a special toxicity test can be performed which looks at 3 areas,

- Check to see if DNA structure is changed.
- Look for reproductive system changes or fetal damage.
- Determine if the product is carcinogenic.

How to reduce side effects and toxic effects of herbal treatment

1. Use formulas

TCM is well known for the safety and gentle effects of its herbal formulas. The formulas use groups of herbs to achieve a balanced effect in the body. Each formula has a four part combination.

- Gen - Main ingredient to deal with condition.
- Chen - Assistant ingredient to deal with condition and help main ingredient reinforce its action.
- Zui - Balance the interaction of herbs and reduce side effect.
- Shi - Direct the herbs to act on certain organ, part of the body or meridian.

Example: D100 for arthritis has been used for 500 years. The five single herbs have side effects. Almost every herb has a positive LD50 result. Therefore, each of these herbs has a potential for toxicity. However, in the prescription formula, the LD50 potential disappears. The risk of toxicity is eliminated, only the MTD is found, so the herbs are much safer when used in a formula than when used individually.

Example: Fu Zi (Aconite) If this herb is used alone it is very toxic. Many herbologists are afraid of using it, because it has an LD50. However, if the same dose is used in a formula such as S170 (Si Ni Tang), the toxicity is reduced by 4 times.

2. Use processed herbs

TCM has used herbal medicine for thousands of years. This experience has resulted in precise methods for processing herbs to maximize their benefits.

Example: FoTi (He Shou Wu) The difference between the processed and the raw herb's LD50 is 54.4 times.

Example: Aconite I the raw herb is boiled in water for 60 minutes the toxicity is reduced 250 times.

3. Use appropriate treatment course (length)

"Zhong Bing Ji Zhi" - once you attack the disease, then control it, then you stop without hesitation. The following herbs should not be given in large doses or over long intervals:

- Fu Zi, Chuan Wu, Cao Wu, Cao Guo, Ku Lian Gen Pi, Qian Niu Zi, Xing Ren, Ma Qian Zi, Hua Jaio, Ba Dou, Da Ji, Ban Xia, Nian Xin, Lei Wan, Shui Zhi, Zao Jiao, Shang Lu, Shan Ci Gu, Wu Zhu Yu, Bai Fu Zi, Tian Xian Mao.

4. **With chronic conditions**, where herbal formulas are used on a long term basis; use a 7 day rest period off of the formula each month to reduce toxic effects. Then continue the formula.

To Enhance the Effectiveness of Herbal Formulas

1. Use formulas to make use of synergistic effects of herbal interactions, such as B120.

2. Use TCM theory for individual analysis to create individualized prescriptions.
3. Increase dosage for severe conditions or emergency need, pain syndromes or fever for up to two weeks. This will assist in controlling the condition, then reduce dose to therapeutic dose.
4. Use acupuncture in conjunction with herbal formula for a strong beginning, then when the condition stabilizes cut back to herbs only.
5. Combine herbal formula use with western medications. One example is Cortisone, add herbs to treatment until condition is stable then reduce the medication. The same approach can also be used for hypertension medication.
6. Use herbal formulas in early stage of condition, such as common colds, etc..
7. Use a quality product that works well.
 - A. Choose concentrated herbs in powder or granule form.
 - B. Make sure the concentrated herbs are highly soluble.
 - C. The product has quality control standards.

Conclusion

Traditional Chinese Medicine has thousands of years history that has made use of herbal preparation. Herbal formula have been proven to be safe and effective in strengthening and balancing the body.

As practitioners of herbal medicine it is important that you become familiar with the herbal formulas, possible side effects and toxicity. Increasing your knowledge will benefit not only your practice but also your patients. You will become more confident in your approach. If you are familiar with the pharmacology and its terminology, you will be better able to explain the herbal formula's action in terms that your patients can understand.