The Modern-Day Clinical Treatment of Acute Leukemia

by Simon Becker

In the October 01 issue of the Blue Poppy e-zine, I discussed the 2000 year long historical development of today’s modern Chinese medical treatment of leukemia. That article, although it provided a small amount of clinical references for the treatment of chronic leukemia, focused primarily on the disease and treatment history. Hence, this article focuses entirely on clinical issues in the treatment of acute leukemia. Below, I review the Western medical explanation and treatment of acute leukemia, discuss the Chinese medical disease explanation of this disease, and report on several different clinical audits from China. Furthermore, because the effective treatment of acute leukemia requires the simultaneous use of chemotherapy, this article also discusses the Chinese medical treatment of patients receiving chemotherapy.

Acute leukemia in biomedical terms: an overview

Acute leukemias are rapidly progressing forms of leukemias characterized by replacement of normal bone marrow by blast cells of a clone arising from malignant transformation of a hemopoietic stem cell. Without treatment, they are rapidly fatal and patients die within about two months. Acute leukemias are divided into two groups: acute myelogenic leukemia (AML) and acute lymphocytic leukemia (ALL). AML constitutes 20% of all leukemias in Western countries. ALL comprises 10% of all leukemias in the West. However, whereas AML accounts for 20% of childhood leukemias, ALL is the most common childhood malignancy and 60% of ALL occurs in children. In the United States, ALL is twice as common in whites as in blacks and the peak incidence rate is between three to five years of age. ALL also occurs in adolescents and less commonly in adults. AML occurs in all ages, accounts for 20% of acute leukemia in childhood and for 85% in adults.

The causes for both types of acute leukemia are unknown. However, chemotherapeutic agents, irradiation, genetic abnormalities (most notably Down syndrome), and other hematopoietic diseases such as myelodysplastic syndrome (MDS), aplastic anemia (AA), paroxysmal nocurnal hemoglobinuria (PNH), etc. are established risk factors. The pathogenesis of acute leukemia is principally related to the accumulation of leukemic cells in the bone marrow which replace normal hematopoietic cells and spread to the liver, spleen, lymphnodes, CNS, kidneys, and gonads. Disruption of organ function is usually minimal except for involvement of the CNS and bone marrow. Meningeal infiltration results in increased intracranial pressure, and replacement of normal hematopoiesis in the bone marrow causes anemia, thrombocytopenia, and granulocytopenia. Infiltration of the liver, spleen, and lymphnodes leads to enlargement of these organs.

Symptoms and signs of acute leukemia indicate the consequences of failure of normal hematopoiesis: bleeding, pallor, and fever. Bleeding usually involves the skin and mucous membranes and uncommonly is associated with hematuria or gastrointestinal bleeding. Sometimes, bone and joint aches are present. Bacterial infections secondary to neutropenia may bring the patient to medical attention. CNS involvement,

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1This article first appeared in the Journal of Chinese Medicine’s October 01 edition.

2That article can now be viewed at www.chinesemedicalhematology.com

presenting with initial headache, vomiting and irritability, is common even in the early stages of disease; this complication is now prevented by prophylactic irradiation of the craniospinal axis. A more insidious onset of acute leukemia is associated with progressive weakness, lethargy, and pallor. Modern aggressive chemotherapy is the treatment of choice and has dramatically altered the outlook of this disease. Clinical remissions and even complete cures are no exceptions anymore in patients who used to die within a few months prior to the invent of chemotherapy.

**Acute leukemia in Chinese medical terms: disease explanation**

Acute leukemia belongs to the Chinese medical disease categories of acute taxation (*ji lao*), heat taxation (*re lao*), and vacuity taxation (*xu lao*). Furthermore, if fever, bleeding, and enlargement of the liver and spleen or swelling of the lymph nodes appear, then this disease may also be classified as such Chinese medical disease categories as bleeding conditions (*xue zheng*), warm diseases (*wen bing*), stasis and accumulation (*yu ji*), or phlegm nodulation (*tan he*). However, not all modern Chinese medical practitioners agree that these terms accurately describe this disease’s nature and pathologic essence. For example, Master Huang, a famous Chinese doctor with over 50 years of experience, finds the term blood cancer (*xue ai*) more appropriate. He thinks that the traditional disease categories, such as warm diseases or bleeding conditions simply reflect certain aspects of disease development and disease course but not the disease root. In Master Huang’s opinion, blood cancer more accurately reflects not only this disease’s nature but also its pathologic essence. Furthermore, blood cancer can then be divided into the different subtypes of vacuity taxation, heat taxation, bleeding conditions, or warm diseases.

The most commonly accepted Chinese medical disease explanation for acute leukemia is what Master Huang defines as latent evils (*fu xie*). The concept of latent evils was first discussed in relation to warm disease theory (*wen bing xue*). However, Master Huang specifically points out that his idea of latent evils is somewhat different from the warm disease theory concepts of latent qi warm disease or latent evils⁵. He states:

> The disease cause includes an internal and an external cause: the internal cause is righteous qi insufficiency; the external cause are evil toxins. If evil toxins enter and assail, they do not effuse immediately but [rather] hide deeply in the bone marrow. After a certain course of accumulation and amassment, the condition is reached [where the accumulated evils] and the righteous qi mutually fight. Hence, the disease effuses. After treatment, righteous is [again] exuberant and evils have been depleted; [thus,] the disease condition is resolved. However, evil toxins still have not been eliminated completely and again lie hidden in the bone marrow or smolder internally in the brain or in the testicles and watch

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⁴Stasis and accumulation is sometimes and more completely called concretions and conglomerations, accumulations and gatherings (*zheng jia ji ju*). Concretions and accumulations are masses of definite form and location, associated with pain of fixed location. They stem from disease in the viscera and bowels. Conglomerations and gatherings are masses of indefinite form, which gather and dissipate at irregular intervals and are attended by pain of unfixed location. They are attributed to disease in the bowels and qi aspect.

⁵Of course, this difference is relatively minor. Both concepts, obviously, deal with an evil (*xie*) which is latent (*fu*) somewhere in the body. However, the difference lies therein that the warm disease theory specifically states that evils are contracted during the winter months and effuse during spring. Furthermore, the warm disease theory never specifically mentions that evils hide in the bone marrow. Thus, the difference is more theoretical than practical.
Master Huang finds that this concept of latent evils not only accurately describes the disease cause but also explains acute leukemia’s pathology, including its recurrences.

Following Master Huang’s statements quoted above, the disease mechanisms of the various leukemic symptoms are all either due to righteous vacuity or the contraction of external evils. Hence, fatigue and weakness are due to qi vacuity. Bleeding is most commonly due to heat stirring and frenetically moving the blood and less commonly due to vacuous spleen qi failing to contain the blood. Furthermore, bleeding associated with a DIC also involves blood stasis. Pallor is due to blood vacuity secondary to non-engenderment by the spleen. Fever is initially due to invasion of the body by external heat evils. However, as these heat evils enter deeper, they also detriment and wither fluids and yin and therefore may lead to vacuity fever. Heat may also brew the fluids into phlegm which then accumulates into nodules. Similarly, heat may damage and consume blood, causing its flow to become stagnant and static. The combination of phlegm and stasis, commonly referred to as phlegm stasis, will give rise to enlargement of the liver and spleen.

Clinically, because this disease is characterized by internal righteous vacuity and external evil repletion, most if not all of the above mechanisms are commonly involved simultaneously and thus all need to be addressed. Hence, real-life treatment principles always include both supplementation and draining. However, in certain cases, the vacuity is more pronounced whereas in other cases, the repletion is more pronounced. According to an article by Xu Rui-rong et al., the severity of vacuity and repletion can often be correlated to the stage of the disease and the advancement within a chemotherapeutic program. They state:

Generally, when infections with high fever and severe bleeding manifest, the pattern is discriminated as heat evil accumulation and exuberance. This may occur early or before chemotherapy but also late during or [even] after chemotherapy as the bone marrow is suppressed [and hence leaves the immune system without a defense]. If infections and bleeding are not severe and [one is still] in the early stages of chemotherapy, the pattern can in many cases be discriminated as qi and yin dual vacuity. The main manifestations [of this pattern] are low-grade fever, lack of strength, spontaneous sweating, and night sweating... After [successful] chemotherapy, although the body enters the recovery phase, the bone marrow is [commonly] suppressed. This phase, in many cases discriminated as qi and blood dual depletion, manifests with a low white blood cell count [secondary to bone marrow suppression], no obvious infections, and [such other symptoms as] lack of strength, dizziness, heart palpitations, and torpid intake.7

Although the above quotation divides acute leukemia in three simple patterns, clinically, as pointed out earlier, this disease commonly presents with simultaneous vacuity and repletion. For example, Master Huang feels that “the nature and disease mechanism of acute leukemia have a root vacuity and evil repletion.” Hence, he advocates the basic treatment principles of dispelling evils and supporting the righteous to bring leukemic patients into remission, the fundamental treatment goal. The treatment principles of dispelling evils and supporting the righteous include the treatment methods of resolving

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toxicity, quickening blood, boosting qi and engendering blood.

**Acute leukemia in Chinese medical terms: modern clinical treatments**

In 1986, Master Huang used the formula *Fu Fang Huang Dai Pian* (Compound Formula Realgar and Indigo Tablet) which contains Realgar (*Xiong Huang*), Pulvis Indigonis (*Qing Dai*), Radix Salviae Miltiorrhizae (*Dan Shen*), and Radix Pseudostellariae Heterophyllae (*Tai Zi Shen*)\(^8\) to treat 125 cases suffering from acute promyelocytic leukemia (APL). The patients’ age ranged from 5 to 72 years with a mean of 30 years; out of the 125 cases, 73 were male and 52 were female; and all patients suffered from the FAB\(^9\) stage M\(^3\) (determined through blood and bone marrow analysis). The treatment consisted of taking between 5-12 tablets (one tablet weighed 0.25g) three times per day after meals until they entered complete remission. According to the patients’ conditions, if necessary, they received treatment-supportive antibiotics, stop bleeding medication, or blood transfusions. Ten patients were admitted to the hospital because of difficulty with taking the Chinese medicinals\(^10\); these patients received intravenous or intramuscular cephalotoxinone (0.5-1mg/day) and cytarabine (10-20mg/day) for one week\(^11\).

Out of the 125 cases, all entered complete remission. The complete remission lasted between 30 to 107 days. Further, no severe infections or bleeding effused during the treatment course and the treatment did not cause or aggravate DICs.

In another study published in the *Zhong Yi Za Zhi (Journal of Chinese Medicine)* and authored by Xiao Qian\(^12\), Chinese medical treatment based on pattern discrimination was combined with chemotherapy in the treatment of 38 cases of acute leukemia. The patients’ age ranged from 18 to 65 years; out of the 38 cases, 17 were male and 21 were female. Their acute leukemia varied from an L\(^1\) stage to as severe as an M\(^5\) stage. All patients were divided into the three Chinese medical patterns of heat toxin accumulation and exuberance, qi and yin dual vacuity, and spleen and kidney dual vacuity; Chinese medical treatment was based on these patterns.

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\(^8\) Realgar contains arsenic and is highly toxic. Therefore, this formula needs to be prescribed very carefully. Please see later in the article for a full discussion of why this medicinal is used, what kind of side-effect it can lead to, and what Master Huang thinks about its dangers.

\(^9\) FAB stands for French-American-British and represents a system of classification of hematological diseases. This system is commonly used throughout the world to classify the severity and stages of certain hematological diseases. It classifies leukemia into lymphoid (L) and myeloid (M) types. The different numbers after the L or M refer to different cellular characteristics. Usually, the higher the number, the more undifferentiated the cells and therefore the more severe the leukemia. The FAB system divides lymphoid leukemia into L\(_{1,3}\) and myeloid leukemia into M\(_{1,7}\).

\(^10\) It is not clear from the article what exactly these difficulties were. However, they possibly related to the high toxicity of *Xiong Huang* in this prescription. Please see later in the article for a more complete discussion of this issue.

\(^11\) The combination of these two drugs is also known as an HA program and is a commonly used chemotherapy for patients suffering from APL.

The heat toxin accumulation and exuberance pattern, more commonly seen during the early stages of acute leukemia, manifested with vigorous fever, thirst, sweating, vexation and agitation, headache, scorched lips, reddish urine, constipation, tongue and mouth sores, swollen and painful throat, swollen and distended gums, coughing and expectorating of yellow phlegm, peri-anal swelling and pain, subdermal purple macules, spontaneous blood ejection, bloody stools, a red tongue with yellow fur, and a rapid pulse. The 8 patients suffering from this pattern were prescribed a medicinal formula based on the treatment principles of clearing heat, resolving toxins, draining fire and engendering fluids. The formula included Rhizoma Coptidis Chinensis (Huang Lian), 3g, Radix Scutellariae Baicalensis (Huang Qin), 9g, Cortex Phellodendri (Huang Bai), 9g, Fructus Gardeniae Jasminoidis (Zhi Zi), 9g, Fructus Forsythia Suspensae (Lian Qiao), 9g, Radix Scrophulariae Ningpoensis (Xuan Shen), 12g, Radix Angelicae Sinensis (Dang Gui), 15g, Radix Rubrae Paeoniae Lactiflorae (Chi Shao), 15g, Radix et Rhizoma Rhei (Da Huang), 5g (added later), Radix Lithospermi seu Arnebiae (Zi Cao), 30g, Pulvis Indigonis (Qing Dai), 5g, Herba Agrimoniae Pilosae (Xian He Cao), 30g, and Herba Oldenlandiae Diffusae (Bai Hua She She Cao), 30g.

The qi and yin dual vacuity pattern, more commonly seen during the middle and later stages, manifested with fatigue and lack of strength, hair loss, pale facial complexion, and a fine and forceless pulse. The 19 patients suffering from this pattern were prescribed a medicinal formula based on the treatment principles of boosting qi, nourishing yin, and supplementing the blood. The formula included Radix Codonopsis Pilosulae (Dang Shen), 15g, Radix Astragali Membranacei (Huang Qi), 40g, Radix Angelicae Sinensis (Dang Gui), 15g, Radix Albae Paeoniae Lactiflorae (Bai Shao), 15g, prepared Radix Rehmanniae (Shu Di), 15g, Rhizoma Polygonati (Huang Jing), 10g, Radix Polygoni Multiflori (He Shou Wu), 15g, Fructus Lycii Chinensis (Gou Qi Zi), 15g, Gelatinum Corii Asini (E Jiao), 12g, Placenta Hominis (Zi He Che), 10g, Fructus Schisandrae Chinensis (Wu Wei Zi), 5g, and Radix Salviae Miltiorrhizae (Dan Shen), 15g.

The spleen and kidney dual vacuity pattern, generally seen in patients suffering from post-chemotherapeutic bone marrow suppression, manifested with shortness of breath, lack of strength, aching lumbus and limp knees, hair loss, reduced sexual desire, non-regulated menses, poor food intake, unwell feeling in the stomach duct, abdominal distension, loose stools, white tongue fur, and a fine, slow and weak pulse. The 11 patients suffering from this pattern were prescribed a medicinal formula based on the treatment principles of fortifying the spleen and supplementing the kidneys. The formula included Radix Codonopsis Pilosulae (Dang Shen), 10g, Rhizoma Atractylodis Macrocephalae (Bai Zhu), 15g, Sclerotium Poriae Cocos (Fu Ling), 15g, Radix Astragali Membranacei (Huang Qi), 20g, Pericarpium Citri Reticulatae (Chen Pi), 6g, Rhizoma Pinelliae Ternatae (Ban Xia), 15g, prepared Radix Rehmanniae (Shu Di), 15g, Radix Angelicae Sinensis (Dang Gui), 15g, Radix Albae Paeoniae Lactiflorae (Bai Shao), 10g, Radix Achyranthis Bidentatae (Niu Xi), 10g, Rhizoma Curculiginis Orchoidis (Xian Mao), 10g, Herba Epimedii (Yin Yang Huo), 8g, Herba Leonuri Heterophylli (Yi Mu Cao), 15g, and Gelatinum Corii Asini (E Jiao), 10g.

For all of the above groups, the medicinals were prepared as a water decoction and one ji was administered daily. Thirty days constituted one treatment course. In addition to the Chinese medicinals, all patients in the treatment group also received appropriate chemotherapy and such other Western medical treatments as blood transfusions and anti-infection medications.

The control group consisted of 38 cases and ranged in age from 17 to 61 years. Out of the 38 cases, 18 were male and 20 were female. Their acute leukemia stages also varied from L1 to M5. The patients in this group were treated only with the appropriate chemotherapy and the other Western medical treatments administered to the treatment group. They did not receive Chinese medicinals.

The treatment results were analyzed according to several criteria. The overall amelioration rate, which
HA and DA programs are modern chemotherapeutics. The inclusion criteria in the study were patients suffering from myelogenic leukemia, with stages ranging from M1 to M6. The study was randomized, with 50 patients assigned to either the treatment group or the control group. The treatment group received a combination of Chinese medicinals and chemotherapy (HA and DA programs) for remission induction and maintenance, respectively. The Chinese medical treatment was based on the pattern discrimination of three different patterns: qi and yin dual vacuity, qi and blood dual depletion, and heat toxin accumulation. The main manifestations of the qi and yin dual vacuity pattern included lack of strength, spontaneous sweating, night sweats, low-grade fever, thirst, dry throat, nose bleeding, gum bleeding, red or pale red tongue, and a fine and rapid pulse. The Chinese medicinals used included Radix Astragali Membranacei (Huang Qi), Radix Pseudostellariae Heterophyllae (Tai Zi Shen), Rhizoma Atractylodis Macrocephalae (Bai Zhu), Sclerotium Poriae Cocos (Fu Ling), Radix Rehmanniae (Sheng Di), Rhizoma Polygonati (Huang Jing), Tuber Asparagi Cochinensis (Tian Men Dong), Tuber Ophiopogonis Japonici (Mai Dong), Fructus Ligustri Lucidi (Nu Zhen Zi), and Herba Ecliptae.

The overall amelioration rate, as well as the rate of entering complete remission, was significantly higher in the treatment group (P<0.05). The survival period was analyzed in terms of 1, 3, 5, or more than 5 years. The survival period was significantly longer in the treatment group (P<0.05). Both groups were also analyzed as to side effects caused by the chemotherapy. The side effects which were compared between the two groups were nausea and vomiting, diarrhea, liver function abnormality, and bone marrow suppression. Furthermore, the groups were also compared as to the rate of infections, bleeding, and DICs. Table 1.1 lists the findings:

<table>
<thead>
<tr>
<th>Group</th>
<th>Patient #</th>
<th>Nausea and vomiting</th>
<th>Diarrhea</th>
<th>Liver function abnormality</th>
<th>Bone marrow suppression</th>
<th>Infection</th>
<th>Bleeding</th>
<th>DIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>38</td>
<td>21</td>
<td>1</td>
<td>2</td>
<td>23</td>
<td>15</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Control</td>
<td>38</td>
<td>32</td>
<td>4</td>
<td>5</td>
<td>36</td>
<td>24</td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 1.1: Comparison of the control and treatment group as to side effects and other accompanying symptoms between the two groups.

Chemotherapy in combination with Chinese medicinal treatment was also used in a study authored by Xu Rui-rong et al. and published in the Zhong Guo Zhong Xi Yi Jie He Zha Zi (Chinese National Journal of Integrated Chinese and Western Medicine)\textsuperscript{13}. In this clinical audit, a total of 50 patients suffering from myelogenic leukemia (ranging from an M1 to an M6 stage) were treated with a combination of Chinese medicinals and an HA program for remission induction and DA program for remission maintenance\textsuperscript{14}.

The Chinese medical treatment was based on the pattern discrimination of three different patterns: qi and yin dual vacuity, qi and blood dual depletion, and heat toxin accumulation and exuberance. The main manifestations of the qi and yin dual vacuity pattern were lack of strength, spontaneous sweating, night sweats, low-grade fever, thirst, dry throat, nose bleeding, gum bleeding, a red or pale red tongue, and a fine and rapid pulse. The 38 patients suffering from this pattern were prescribed a formula based on the treatment principles of boosting qi and nourishing yin which included Radix Astragali Membranacei (Huang Qi), 30g, Radix Pseudostellariae Heterophyllae (Tai Zi Shen), 30g, Rhizoma Atractylodis Macrocephalae (Bai Zhu), 12g, Sclerotium Poriae Cocos (Fu Ling), 12g, uncooked Radix Rehmanniae (Sheng Di), 15g, Rhizoma Polygonati (Huang Jing), 24g, Tuber Asparagi Cochinensis (Tian Men Dong), 15g, Tuber Ophiopogonis Japonici (Mai Dong), 15g, Fructus Ligustri Lucidi (Nu Zhen Zi), 24g, Herba Ecliptae.

\textsuperscript{13} Xu Rui-rong et al., p.302-303

\textsuperscript{14} HA and DA programs are modern chemotherapeutics.
Prostratae (*Han Lian Cao*), 18g, Herba Scutellariae Barbatae (*Bai Hua She She Cao*), 30g, Herba Oldenlandiae Diffusae (*Bai Hua She She Cao*), 30g, Herba Taraxaci Mongolici cum Radice (*Pu Gong Ying*), 30g, and Herba Cephalanoplos Segeti (*Xiao Ji*), 30g.

The main manifestations of the qi and blood dual depletion pattern were dizziness, tinnitus, fatigue and lack of strength, bright white facial complexion, heart palpitations, shortness of breath, spontaneous sweating, a pale tongue, and a vacuous and large or deep and fine pulse. The eight patients suffering from this pattern were prescribed a formula based on the treatment principles of supplementing qi and nourishing blood which included Radix Astragali Membranacei (*Huang Qi*), 30g, Radix Codonopisits Pilosulae (*Dang Shen*), 30g, Rhiomzoma Atractylodis Macrocephala (*Bai Zhu*), 12g, Sclerotium Poriae Cocos (*Fu Ling*), 12g, Radix Angelicae Sinensis (*Dang Gui*), 24g, Fructus Psoraleae Corylifoliae (*Bu Gu Zhi*), 24g, Fructus Lycii Chinensis (*Gou Qi Zhi*), 18g, Gelatinum Corii Asini (*E Jiao*), 12g, Rhizoma Polygoni Multiflori (*He Shou Wu*), 24g, Herba Oldenlandiae Diffusae (*Bai Hua She She Cao*), 30g, Herba Cephalanoplos Segeti (*Xiao Ji*), 30g, and Radix Glycyrrhizae (*Gan Cao*), 6g.

The main manifestations of the heat toxin accumulation and exuberance pattern were vigorous fever, thirst, sweating, vexation and agitation, headache, scorched lips, reddish urination, constipation, tongue and mouth ulcers, throat swelling and pain, gum swelling and distension, coughing and expectoration of yellow phlegm, swollen and painful anus, subdermal purple macules, spontaneous blood ejections, bloody stools, a red tongue with yellow fur and a rapid pulse. The six patients suffering from this pattern were prescribed a formula based on the treatment principles of clearing heat and resolving toxicity which included uncooked Radix Rehmanniae (*Sheng Di*), 24g, Radix Rubrae Paeoniae Lactiflorae (*Chi Shao*), 15g, Radix Scrophulariae Ningpoensis (*Xuan Shen*), 15g, Flos Lonicerae Japonicae (*Jin Yin Hua*), 30g, Fructus Gardeniae Jasminoidis (*Zhi Zi*), 12g, Fructus Forsythiae Suspensae (*Lian Qiao*), 15g, Radix Isatidis seu Baphicacanthi (*Ban Lan Gen*), 30g, Radix Scutellariae Baicalensis (*Huang Qin*), 15g, Radix Lithospermi seu Arnebiae (*Zi Cao*), 15g, Herba Oldenlandiae Diffusae (*Bai Hua She She Cao*), 30g, Herba Taraxaci Mongolici cum Radice (*Pu Gong Ying*), 30g, Herba Cephalanoplos Segeti (*Xiao Ji*), 30g, and powdered Radix Notoginseng (*San Qi*), 3g, dissolved in the strained decoction.

The above formulas were prepared as water decoctions and one ji was taken daily. Treatment was continued until patients entered complete remission. Thereafter, medicinal prescriptions based on the patients’ presenting patterns were continued to maintain treatment effect.

The results of this clinical audit were as follows: out of the 50 patients, 35 cases (70%) entered complete remission, 6 cases (12%) entered partial remission, and 9 cases (18%) experienced no effect. Therefore, the overall amelioration rate was 82%. The survival rate in the complete remission group was between 87 to 2353 days with an average of 758 days (about 2 years) for the 29 patients which came for follow-up visits. At the time of writing of this clinical audit, 12 patients out of the 29 were still alive; their time of survival ranged from 610 to 2353 days with an average of 1245 days.

One medicinal mentioned above for the treatment of acute promyelocytic leukemia (APL) is Realgar (*Xiong Huang*). According to the *Zhong Yao Da Ci Dian (A Great Dictionary of Chinese Medicinals)*, *Xiong Huang* is acrid, bitter, warm and has toxins, and it enters the heart, liver and stomach channels. It dries dampness, dispels wind, kills worms, and resolves toxins. The recommended dosage for internal use is 1-4 fen (0.3-1.2g) in powders or pills. Master Huang, when discussing *Xiong Huang* in relation to APL, says

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**Note:**

that it resolves toxins and dispels evils. Similarly, according to the Fifth All-China Scientific Conference on Integrated Chinese-Western Hematology in 1998, Chinese medical hematology specialists agree that Xiong Huang seems to be one of the main medicinals to treat APL. According to a report on this conference, the arsenic in prescriptions which contain Xiong Huang is believed to not only induce cellular differentiation but also promote dying of leukemic cells. Other formulas containing Xiong Huang which were highlighted in this conference report were Fu Fang Bai Xue Ning Yi Hao (Quiet Leukemia Compound Formula Number One) from the Hubei Chinese medical hospital which contained Realgar (Xiong Huang), Radix Astragali Membranacei (Huang Qi), Radix Angelicae Sinensis (Dang Gui), and Radix Sophorae Flavescentis (Ku Shen) as well as a prescription from the National Chinese Medicine Reserach Department of Xi Yuan Hospital which included Xiong Huang and Pulvis Indigonis (Qing Dai). In the treatment of 7 patients suffering from acute non-lymphocytic leukemia (ANLL) with the latter formula, 5 patients entered complete remission. Four out of these five combined the above Chinese medicinal therapy with chemotherapy. Their survival periods were 9, 17, 18, and 20 years.

According to Master Huang, Xiong Huang belongs to the “severely toxic” medicinals of the Chinese materia medica. Hence, it may cause side effects manifesting as digestive, renal, nerve, or skin symptoms. If severe, it may lead to arsenic poisoning. Therefore, Master Huang does his proposed APL formula Fu Fang Huang Dai Pian very carefully and monitors patients’ progress frequently and attentively. It is his opinion that, albeit there are a few patients which, while taking this prescription, develop reversible liver function damage, this formula does not usually cause marked heart, liver, and kidney damage. Furthermore, Master Huang advocates the combination of Xiong Huang with Pulvis Indigonis (Qing Dai); according to Master Huang, Qing Dai increases Xiong Huang’s function to kill leukemic cells, even though Qing Dai does not possess a leukemia cell killing function on its own.

The Chinese medical treatment of chemotherapy

Two out of the above three clinical audits and the majority of studies published in the Chinese medical literature dealing with acute leukemia report on the use of not simply Chinese medicinals but the combination of Chinese medicinals with modern biomedical chemotherapeutic agents. Furthermore, in our Western medically dominated health care system, patients suffering from acute leukemia and coming to Chinese medical practitioners for medicinal treatments will most likely already be taking chemotherapeutic drugs. And although some Western medically-opposed patients may seek only alternative care (i.e., only Chinese medicine), it has to be stressed that it is the combination of chemotherapy with Chinese medicinals which is most widely used and which seems to achieved the most promising clinical results. Also, it is my opinion that the Chinese materia medica does not offer equally strong medicinals at less toxicity; hence,

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17. Ibid, p.753.

18. Symptoms of arsenic poisoning include throat constriction, dysphagia, burning GI pain, vomiting, diarrhea, dehydration, pulmonary edema, renal failure, and liver failure. Immediate referral to the nearest emergency room for emetic therapy, gastric lavage, and chelation therapy is of utmost necessity.

19. For example, although I report above on Master Huang’s use of pure Chinese medicinals in the treatment of APL, his prescription of Xiong Huang is not necessarily less toxic and more effective than some of today’s modern chemotherapeutic drugs.
the use of chemotherapy, if truly indicated, can be of absolute necessity. However, according to the following clinical audit and the research presented above, the use of chemotherapy without the concurrent use of Chinese medicinals does not seem warranted as it a) puts patients at much higher risks of developing severe side effects necessitating the discontinuation of treatment and b) does not seem to achieve as high a remission rate as if a combined Chinese-Western approach is used. Hence, it is important for Chinese medical practitioners to understand the treatment of patients undergoing chemotherapy. Following is a functional translation of an article which appeared in the *Si Chuan Zhong Yi (Sichuan Journal of Chinese Medicine)* and deals specifically with the treatment of chemotherapeutic side effects.

In this clinical audit, 59 cases undergoing chemotherapy after surgical removal of their tumors received Chinese medicinals concurrently with chemotherapy. Out of the 59 cases, 35 were male and 24 were female. Their average age was 58.2 years. Ten cases suffered from stomach cancer, 8 cases suffered from lung cancer, 7 cases suffered from intestinal cancer, 6 cases suffered from primary liver cancer, 1 case suffered from pulmonary metastases secondary to nose cancer, and another case suffered from multiple bone metastases secondary to fibrosarcoma. The 59 cases were divided into the four Chinese medical patterns of phlegm damp obstructing the middle (22 cases), damp heat with depressed toxins (16 cases), stomach yin insufficiency (9 cases) and qi and blood insufficiency (12 cases).

The Chinese medical treatment was based on the treatment principles of regulating and rectifying the spleen and stomach. The different prescriptions were based on the pattern discrimination. One *ji* of the prescription, prepared as a water decoction, was taken daily. One treatment course lasted 1 months. The signs and symptoms of the various patterns and their corresponding medicinal prescriptions are listed below.

Phlegm dampness obstructing the middle pattern: duct oppression, torpid intake, sticky mouth with no desire for liquids, nausea and vomiting, if severe, inability to eat, dizziness, heavy body and limbs, non-crisp stools, a pale red and enlarged tongue with teeth indentations on the edges and white, thick, and slimy fur, and a soggy and fine pulse. The prescription for this pattern included *Sclerotium Poriae Cocos (Fu Ling)*, 12g, *Rhizoma Atractyloides (Cang Zhu)*, *Fructus Citri Aurantii (Zhi Ke)*, 9g each, *Semen Coicis Lachrymae-jobi (Yi Yi Ren)*, 30g, *Fructus Amomi (Sha Ren)*, *Fructus Cardamomi (Bai Dou Kou)*, *Rhizoma Pinelliae Ternatae (Ban Xia)*, *Pericarpium Citri Reticulatae (Chen Pi)*, 6g each, *Rhizoma Alismatis (Ze Xie)*, 10g, and uncooked *Rhizoma Zingiberis (Sheng Jiang)*, 3 pieces.

Damp heat with depressed toxins pattern: duct and abdominal distension and fullness, dry and bitter mouth, constant belching, inability to eat, thirst with no desire to drink, no bowel movements for 3 - 5 days, pale red tongue with yellow, thick, and slimy fur and a bowstring and slippery pulse. The prescription for this pattern included *Radix et Rhizoma Rhei (Da Huang)*, *Cortex Magnoliae Officinalis (Hou Po)*, *Lignum Aquillariae Agallochae (Chen Xiang)*, *Rhizoma Coptidis Chinensis (Huang Lian)*, 6 g each, *Fructus Citri Aurantii (Zhi Ke)*, 9g, *Semen Trichosanthis Kirilowii (Gua Lou Ren)*, *Sclerotium Poriae Cocos (Fu Ling)*, *Rhizoma Atractyloides Macrocephalae (Bai Zhu)*, 12g each, *Rhizoma Alismatis (Ze Xie)*, and scorched *Fructus Crataegi (Shan Zha)*, 10g each. (This formula should only be taken for a relatively short period of time).

Stomach yin insufficiency pattern: Emaciated bodily form, dry skin and flesh, scorching heat within the

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Vacuity puffiness (xu fu) is a technical term in Chinese medicine and refers to swelling of the outer body preceding distension in the inner body with pale urine, unsolid stools, a withered-white facial complexion, low timid voice, and a forceless, fain, or fine pulse. The prescription for this pattern included Radix Glehniae Littoralis (Bei Sha Shen), Radix Trichosanthis Kirlowii (Tian Hua Fen), Gypsum (Shi Gao), 15g each, Cortex Moutan Radicis (Dan Pi), Radix Scutellariae Baicalensis (Huang Qin), 9g each, Fructus Pruni Mume (Wu Mei), 6g, uncooked Radix Rehmanniae (Sheng Di), Radix Dioscoreae Opposita (Shan Yao), 12g each, Tuber Ophiopogonis Japonici (Mai Dong), Rhizoma Anemarrhenae Asphodeloidis (Zhi Mu), and Fructus Crataegi (Shan Zha), 10g.

Qi and blood insufficiency pattern: Sallow white or withered yellow facial complexion, if severe, vacuity puffiness, dizziness, fatigue and lack of strength, heart palpitations, shortness of breath, torpid intake with scant eating, a pale red tongue, and a fine and forceless pulse. The prescription for this pattern included Radix Astragali Membranacei (Huang Qi), 20g, Radix Codonopsis Pilosulae (Dang Shen), Sclerotium Poriae Cocos (Fu Ling), Rhizoma Atractylodis Macrocephalae (Bai Zhu), Radix Angelicae Sinensis (Dang Gui), Herba Epimedii (Xian Ling Pi), 12g, Caulis Milletiae seu Spatholobi (Ji Xue Teng), Radix Dioscoreae Opposita (Shan Yao), 15g, Gelatinum Cornu Cervi (Lu Jiao Jiao), Radix Albae Paeoniae from Hangzhou (Hang Bai Shao), 10g each, Fructus Amomi (Sha Ren), and honey mix-fried Radix Glycyrrhizae (Gan Cao), 6g each.

The results of this study were as follows: After one treatment course, 25 patients experienced a complete resolution. This meant that their symptoms had dispersed and that their desire to eat returned to normal. Twenty-eight cases experienced a marked improvement. This meant that their symptoms markedly improved and that their desire to eat increased. Six cases experienced no results. Therefore, the overall amelioration rate was 89.9%.

According to the authors of this study, the spleen and stomach are the latter heaven root and the source of engenderment and transformation of qi and blood. A person’s righteous qi depends on the latter heaven’s spleen and stomach for transformation and engenderment of essence qi of water and grain. This is the correct meaning [of the statement]: “[if] there is stomach qi, there is life; if there is no stomach qi, there is death.” Hence, the use of the [treatment] method of regulating and rectifying the spleen and stomach is the dao to treat this disease’s root. The methods of fortifying the spleen, dispelling dampness, and transforming phlegm; the methods of fortifying the spleen, eliminating dampness, and attacking evils; the methods of arousing the spleen, boosting the stomach, and engendering fluids; and the methods of fortifying the spleen, boosting the qi, and nourishing blood all lead to spleen movement and hence to the spontaneous transformation of phlegm dampness, the elimination of damp heat and depressed toxins.

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21Vacuity puffiness (xu fu) is a technical term in Chinese medicine and refers to swelling of the outer body preceding distension in the inner body with pale urine, unsolid stools, a withered-white facial complexion, low timid voice, and a forceless, fain, or fine pulse.
The effulgence of the spleen and the transformation and engenderment of qi and blood, and the restoration of stomach yin. [Thus,] the patient’s righteous qi is fortified and becomes effulgent and the disease condition is resolved.\(^{22}\)

**Conclusion**

Acute leukemia is a severe and life-threatening disease which requires the use of chemotherapy and Chinese medicinals for the most effective treatment possible. Chinese medical treatment must focus on two aspects: 1) the acute leukemia and 2) the chemotherapeutic side effects. The theory of *fu xie*, latent evils, as outlined above is defining for the disease cause and mechanism of acute leukemia. The root vacuity and branch repletion most commonly is composed of qi, blood, and yin vacuity with heat and toxic evil repletions lying and hiding deeply. In addition, chemotherapeutic agents have a tendency to damage the middle burner and engender dampness and phlegm, damp heat, and damp toxicity. Hence, formulas prescribed to leukemic patients on chemotherapy are often based on the wide ranging treatment principles of enriching yin, boosting qi, and engendering blood to supplement vacuity and clearing heat, resolving toxicity, and draining fire to resolve repletion, thereby addressing the root vacuity evil repletion patterns of acute leukemia; and regulating and rectifying the spleen and stomach, thereby addressing the chemotherapeutically-induced middle burner disharmony.

However, it is important to understand that the treatment of acute leukemia and chemotherapeutic side effects are not two isolated entities which need to be treated separately. Rather, the Chinese medical treatment needs to follow standard pattern discrimination and the prescription needs to be based thereupon. This means that a patient needs to be analyzed as he or she presents at the time of diagnosis, regardless if the manifestations are side effects from the chemotherapy. The fact that these side effects appear means that the corresponding bodily system is out of balance and needs to be treated. Discounting certain individual symptoms as being by-products from the chemotherapy and therefore not treating them is to deviate from the one aspect which makes Chinese medicine so unique and undoubtedly also so effective: *bian zheng lun zhi*, treatment based on pattern discrimination.

Various Chinese research, including some of the clinical audits presented above, support the combination of chemotherapy with Chinese medicinals. This type of combination has at least two major benefits: a) Chinese medicinals effectively control the debilitating side effects of Western chemotherapy and b) probably partly because of the preceding fact, Chinese medicinals seem to improve the efficacy of chemotherapy which then achieves a higher complete remission rate. This statement is also endorsed by the Fifth All China Scientific Conference on Integrated Chinese-Western Hematology of 1998. Its report on acute leukemia (AL) states that the simple use of chemotherapy has a complete remission rate of about 60%. The combination of Chinese medicinals with Western chemotherapy, on the other hand, achieves a complete remission rate of about 70%. Even more significant is the fact that research has confirmed that the combined Western-Chinese treatment seems to kill the remaining leukemic cells after the patient has entered remission. This is not the case with a Western-only treatment approach and leads to significantly increased longterm survival rates.\(^{23}\)

Another interesting and important piece from above which must be taken into consideration if one wants to

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\(^{22}\) Li Zong-ju, p.24-25.

\(^{23}\) “Summary of the Fifth All-China Integrated Chinese-Western Medicine Symposium on Blood Diseases,” p.753.
effectively treat acute leukemia is the dosing of medicinals. Largely because too few Western Chinese practitioners read medical Chinese and therefore cannot research the clinical aspect of modern Chinese treatments, and because most Chinese medical books here in the West have so far been translations of theory books rather than clinical manuals, the Western practitioner of Chinese medicine tends to prescribe medicinals in “theoretical amounts” rather than “clinical amounts.” A careful look at some of the formulas above reveals that 20-30 grams of many medicinals, particularly the chief medicinals of a prescription, is standard practice in China. Furthermore, these amounts are taken per day. In America, the standard of medicinal prescription which is commonly taught in schools is one bag for every 2 to 3 days. Individual medicinal amounts then vary between 3-12, possibly 15, grams. Broken down to the actual gram amount per day, this is about 5 to 10 times less than the average in China. Hence, if results are not achieved or are far below what is reported above, I believe that one of the first and most important changes must be the increase of medicinal amounts to reflect the actual amounts administered in China. Along the same lines it has to be said that pills of ground-up medicinals or even 5:1 or 10:1 concentrates of medicinals are often not sufficient if not taken in mega-doses (which is often financially very difficult or even impossible).

Finally, in my last article dealing with the historical development of leukemia, I made the following statement:

In the Su Wen ‘Treatise on Harmony and Spirit of the Four Qi’ it says: "The greatest people [i.e. best doctors] treat not when there already exists a disease but treat when there is no disease [yet]." This may sound like exceedingly simple advice from 2000 years ago; however, in the treatment of leukemia and many other blood and non-blood diseases, early treatment when no or only very few symptoms manifest, is of great importance.

The above referenced clinical audit by Xu Rui-rong et al. on the combination of chemotherapy with Chinese medicinals in the treatment of myeloid leukemia corroborates this statement with some clinical facts when it points out the following: all patients suffering from either M₁ or M₂ stage leukemia entered either complete or partial remission. On the other hand, all patients who did not enter remission (complete or partial), presented with leukemia of stage M₃ or above. This clearly demonstrates that the early treatment of leukemia leads to markedly better treatment results and is of absolute necessity.