

Chronic Iron Deficiency Anemia Treated with *Bojungicki-tang* : A Case Report

Chang-gue Son

Dept. of Internal Medicine of Oriental Medical College in Dae-jeon University

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ABSTRACT

Objective : To expand the oriental medicine-based strategies or therapeutics for anemia, including iron deficiency anemia.

Methods : A 23 year-old man suffering from severe and chronic iron deficiency anemia was believed to have disorder of iron absorption. He had neither specific medical cause nor positive response to western treatments. Blood and biochemical parameters such as levels of hemoglobin, ferritin, transferrin and serum iron were serially chased during treatments.

Result : *Bojungicki-tang* was given to the patient based on diagnosis as a deficiency of spleen *qi*. The hemoglobin level was normalized along with administration of *Bojungicki-tang*. Also, the distortions of biochemical indicators (ferritin, transferrin and serum iron) reached a normal range within three months.

Conclusion : *Bojungicki-tang* could be a curing remedy for iron deficiency anemia caused by problems in iron absorption if symptom-differentiation has deficiency of spleen *qi*.

Key words : Iron Deficiency Anemia, *Bojungicki-tang*, Oriental medicine, Herbs

I. Introduction

Iron Deficiency Anemia is the advanced stage of iron deficiency, and is the most common type of anemia¹. Iron deficiency usually results from parasitic infections, intestinal bleeding, blood lost during menses or absorption disorder of iron². In case of adult patients, 60% of causes is associated with gastrointestinal disorders leading to chronic

blood loss³. Although this anemia is easily curable by eradication of underlying causes, severe cases of patients have poor quality of life^{4,5}.

The main symptoms are fatigue, pallor and dyspnea. And, unusually pagophagia, pica, hair loss or lightheadedness could be observed depending on severity of anemia⁶. Iron deficiency anemia generally tends to progress slowly, then patients often can not recognize it because of adaptation. The determining the cause of the iron deficiency and correcting the abnormality is the most important treatment. Then, oral iron supplementation shows very efficient outcome⁷.

· Correspondence to: Chang-gue Son, 1136 Dunsan-dong,
Seo-gu, Daejeon 302-122, South Korea.
TEL: 82-42-4709481
E-mail: ckson@dju.ac.kr

However, there are sometimes patients who can hardly be figured out the cause and shows poor therapeutic response to iron supplementation⁸.

The present study reports a clinical case of chronically repeated severe iron deficiency anemia cured by administration of *Bojungicki-tang*, in contrast to his previous poor response to western therapy. The patient was diagnosed as "deficiency of Spleen Qi" by Oriental medicinal theory, and then showed good results in blood test and clinical symptoms. This study aimed to expend the knowledge for iron deficiency anemia and provide a useful herbal drug application, *Bojungicki-tang*, to refractory type of this disorder.

II. Report of the case

1. Characters of patients and diagnosis

A 23 old man visited the Oriental hospital with

complaining severe fatigue, pallor, dizziness, anorexia and loss of energy. He was diagnosed as having Iron Deficiency Anemia from one year ago. On day of first visiting, his hemoglobin level was 7.4 g/dl, and other parameters showed a typical feature of iron deficiency anemia (Table 1). The patient had no specific medical reasons explaining the severe status of anemia such as gastrointestinal bleeding, bone marrow disorder or early destruction of blood from systematic examination in western hospitals.

The patient was diagnosed as "deficiency of Spleen Qi" by Oriental symptom-differentiation and suggested to have disorder in iron absorption. He had kept thin body shape as 175 cm of height and 61 kg of body weight. His mother presented his general body weakness and lack of appetite since child age. Recently, he had been under stress owing to study and a test in his college.

Table 1. Laboratory examination

Lab result	Treating periods (week)									
	0	1	2	3	4	5	7	9	11	13
Hb (g/dl)	7.4	8.4	10.7	13	13.1	13.5	13.3	13.5	13.2	13.2
RBC ($10^6/\text{mm}^2$)	3.70	4.83	5.22	5.48	5.49	5.59	5.61	5.63	5.51	5.48
Hematocrit (%)	24.6	34.6	39	42.3	42.8	43.2	42.7	42.6	41.8	41.1
MCV (fl)	66	72	75	77	78	77	76	76	76	75
MCH (pg)	19.9	21.6	22.5	23.6	23.9	24.1	23.7	24.0	24.0	24.1
Platelet ($10^4/\text{ul}$)	34.4	32.2	39.2	32.5	25.1	29.2	26.4	34.6	31	31.9
Iron (ug/ml)	18				61					67
Transferrin (mg/dl)	323				348					354
Ferritin (ng/ml)	1.4				4.3					8.5
EPO (mIU/ml)	> 290				29.53					18

CBC were determined using an Coulter counter, and iron, transferrin, ferritin and erythropoietin (EPO) were determined in Neodin Medical Institute (Seoul, Korea).

2. Herbs and treatments

Bojungicki-tang (補中益氣湯) was prescribed

for five weeks with the purpose of enhancing Spleen Qi until his symptom for deficiency of

Spleen Qi disappeared. Next, Myelophil was given to patients for eight weeks after recovering his blood test. The compositions of those prescriptions are summarized below (Table 2).

Table 2. Prescription and compositional volume of drugs

<i>Bojungicki-tang</i>	Astragalus membranaceus (6), Panax ginseng C.A.Meyer (4), Atractylodes macrocephala Koidzumi (4) Glycyrrhiza uralensis (4), Angelica gigas Nakai (2), Citrus unshiu Markovich (2), Cimicifuga heracleifolia (0.75), Bupleurum falcatum L. (0.75)
	Astragalus membranaceus (12), Salvia miltiorrhiza Bunge (12)
Myelophil	

The number in () present the weight(gram) of each herb composing of above prescriptions for once administration.

3. Improvement of symptom and lab findings

Based upon his physical characteristics and medicinal history, the symptom was differentiated as "deficiency of Spleen Qi", then *Bojungicki-tang* was prescribed to him. In addition, because the patient's Hb level was much lower than normal and he had several same experiences of iron deficiency anemia, iron supplement was given to the patients for 2 weeks. Blood level of hemoglobin and RBC number began to increase, and were followed by improvement of clinical symptoms such as fatigue, dizziness and anorexia. Once his hemoglobin reached over 10 g/dl through two-week treatment, iron supplement was stopped to chase the curable response of *Bojungicki-tang*. The level of hemoglobin and RBC number continuously increased up to normal range, and distortion of iron-associated serum parameters were directed toward physiological pattern (Fig.

1). Concentrations of iron and ferritin were increased whereas erythropoietin drastically decreased as normal level. However, size of erythrocytes was smaller than normal although the MCV became large as 75 from 65 of initial time point.

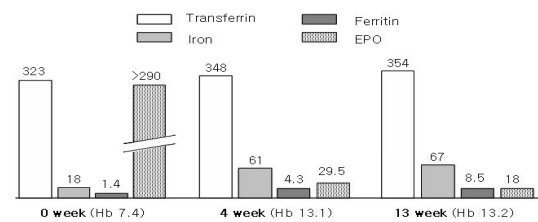


Fig. 1. Serum parameter change along with treatment.

Transferrin (mg/dl), iron (ug/ml), ferritin (ng/ml) and EPO (erythropoietin, mIU/ml) were periodically measured.

III. Discussion

Iron is an essential mineral that is composing hemoglobin in erythrocytes to carry oxygen all over the body. The quantity of iron in the body is intensively controlled, but sometimes the deficiency of iron happens because of imbalance between intake/absorption and loss/utilization of iron⁹. Generally, the most common cause of iron deficiency is bleeding such as menstrual event or gastrointestinal disorders¹⁰.

However, inappropriate absorption rarely becomes a reason for deficiency of iron then induces chronic iron deficiency anemia, which is supposed as in this case study. This patient had no bleeding in gastrointestinal track in several endoscopic examinations, and ate normal meals without diarrhea. Therefore, the absorption disorder was suggested as the cause of this anemia.

About 1 to 3 grams of iron is stored in body, and about 1 mg of iron is lost and absorbed via diets every day¹¹. Iron absorption is much different with iron intake, known as bioavailability. Gastric acid enhances the solubility and uptake of iron, so impairment of gastric acid production reduces iron absorption. Meats are main nutrient sources of iron, then, abnormal heme catabolism in the intestine also induces iron deficiency¹². The prolonged lack of iron lowers the concentration of serum ferritin, storage form of body iron, inducing iron deficiency anemia¹³. This condition lets kidney and liver release the erythropoietin stimulating proliferation of erythrocytes¹⁴. The current case showed the classical alteration and recovery of those proteins. The patient had the typical character of "deficiency of Spleen Qi" based on the physical and historical diagnosis by Oriental medicine theory. *Bojungicki-tang* is a classical prescription to enhance the Spleen Qi. So far, there are many clinical reports for effects of *Bojungicki-tang* on not anemia, but on hyperlipidemia, allergy, and cerebral vascular accident¹⁵⁻¹⁷. Many blood-focussed prescriptions were used to treat various anemia in Oriental clinics¹⁸⁻²⁰. *Bojungicki-tang* was seemed to improve the problem of iron-specific absorption in this patient. Mayelophil known as stimulating bone marrow was prescribed for five weeks after recovery of laboratory and clinical symptom²¹.

Iron deficiency anemia is a common disease which can be improved by removing the underlying causes and giving supplement of iron. But, it rarely shows the refractory pattern irresponsive to conventional therapies as the patient of this case.

The present study showed a possibility of

Bojungicki-tang as a curable remedy for iron malabsorption-induced anemia and informed us the advantage of herbal drug application for anemic patients according to Oriental symptom-differentiation.

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