

## A Clinical Report of Repeated High Fever Treated with *Dalwonum*

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High fever is a common symptom which is considered an important problem, especially in case of undefined causes. Even though most patients generally have been treated by western medicinal treatments, Oriental medicine has developed some prescriptions having therapeutic efficacy of anti-pyrexia. The present study reports a clinical case of prolonged high fever treated by herbal drug, *Dalwonum*. There was no specific cause shown by blood test, urinalysis or radiologic test to explain the periodic fever over 40°C, but body temperature slowly started normalize after administration of *Dalwonum*. This study informed us about the potent usefulness of *Dalwonum* as an anti-pyrexia herbal drug for patients having fever unresponsive to conventional therapies.

**Key Words** : Fever, *Dalwonum*, oriental medicine, herbs

### Introduction

Fever is an adaptive response to a variety of infectious and other inflammatory stimuli, and is a result of a complex interplay of neuroendocrine, autonomic and behavioral responses by the hypothalamus<sup>1,2</sup>. This febrile response is thought to give an immunological advantage to the host against invading microorganisms<sup>3,4</sup>. Nevertheless, fever has frequently been recognized as a sign of illness and has traditionally had negative connotations for patient well-being<sup>5</sup>.

The high body temperature is very unpleasant, but employment of antipyretics generally works well for patient comfort. However, some exceptions exist generating difficult situations, such as fever of unknown origin or fever sustained for a long time in spite of undertaking medical treatments. Especially, for medically unexplained fever it is not easy

to select proper treatment<sup>6</sup>. So, patients with prolonged high fever rarely visit Oriental clinics.

From an Oriental medicine point of view, fever is largely classified into two types, internally originated or externally originated fever, and many prescriptions or managements have been developed<sup>7</sup>. One of those is *Dalwonum*, which has been known as a typical herbal prescription to treat external fever.

Herein, we report a clinical observation of repeated high fever treated by *Dalwonum*. We hope that this study could support further scientific research related to acute application and the mechanisms responsible for its efficacies.

### Report of the case

#### 1. Character of patient and diagnosis

A 73 old woman began to feel a repeated chill-

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**Table 1.** Laboratory examination

Lab result	Admission	Hospitalized days	
		4	8
WBC ( $10^3\text{mm}^2$ )	6.88	4.79	3.82
DC (Neu:Ly:Mo%)*	69.0 : 20.1 : 9.8	65.4 : 25.0 : 8.6	55.9 : 33.3 : 9.5
RBC ( $10^3\text{mm}^2$ )	3.37	3.23	3.64
Hemoglobin (g/dl)	10.9	10.2	11.5
Platelet ( $10^4/\text{ul}$ )	22.8	28.4	38.2
ESR	57	64	56
CRP (mg/dl)	10.47	8.59	1.48
AST (IU/L)	15	14	
ALT (IU/L)	10	11	
GGT (IU/L)	25	23	

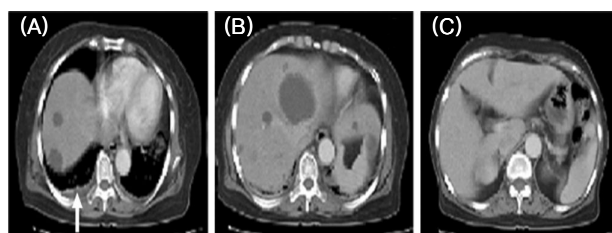
After 12 hours starvation, serological parameters and CBC were determined using an Auto Chemistry Analyzer or Coulter counter. \*DC: Differential count, Neu: Neutrophil, Ly: Lymphocyte, Mo: Monocyte

ing and high fever (over  $39^\circ\text{C}$ ) with malaise, muscle pain, frank discomfort, dry mouth and sever anorexia from around forty days before visiting Oriental Hospital on 27th March in 2008. On the physical examination, her both lateral flank area was very sensitive by palpitation, while others were no suspicious in abdomen, throat, skin and her breath sound as well as no coughing. She had continuously had taken western medicinal treatments till the day of administration in Oriental hospital. She had no specific familial history, but had medical history such uterectomy in 1986, and surgery due to gallstone and appendicitis in 1996. After admission in Oriental Hospital, blood test presented normal range in CBC, LFT, and urinalysis except significant elevation of ESR and CRP, and slight anemic result

(Table 1). Radiologic examination with chest X-ray showed no abnormality, while sonogram and computed tomography found multiple hepatic cysts with around 10 cm diameter for the largest one (Fig. 1). The post cholecystectomy state was confirmed in this test. Patient informed that she had not traveled to out of city, and eaten any raw seafoods.

## 2. Herbs and treatment

*Dalwonum* (達原飲) was prescribed for six days as targeting high body temperature, then *Samlyung-baekchoolsan* (SBS, 參苓白朮散) was given to patients for 3 days after recovering from high fever. The compositions of those prescriptions are summarized below (Table 2). 5% distilled water or normal saline with vitamin complex but no other



**Fig. 1.** Abdomen and pelvic CT: Small amount pleural effusion (indicated by ? in A), multiple hepatic cysts (B) and post cholecystectomy state (C) were observed.

**Table 2.** Prescription and compositional volume of drugs

<i>Dalwonum</i>	Alismatis Rhizoma(15), Poria cocos(9), Atractylodis Macrocephalae Rhizoma(9), Polyporus(9), Cinnamomum cassia(3) Artemisia capillaris Herba(6)
<i>SBS</i>	Bupleuri Radix(12), Scutellariae Radix(8), Ginseng Radix(4), Pinelliae Rhizoma(4), Glycyrrhizaw Radix(2), Zingiberis Rhizoma(4), Zizyphi inermis Fructus(2)

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

west medicine were supplied throughout hospitalized days.

### 3. Course of symptoms, lab examination and CT finding

From first hospitalized day, patient had high fever by 39-40°C with general complains such as loss of energy, no appetite, headache, chilling but no sings related to respiratory or urinary track disorders. The fever responded against taking aspirin but repeatedly occurred as same patterns as did before coming Oriental hospital. Total ten times of aspirin were given to her, and five times at the 2nd day of admission because of repeated high fever over 41°C. However, the frequency of fever occurrence and severity started to decline from three day of hospitalization, and high fever was finished after taking *Dalwonum* for four days. Of course, her complains

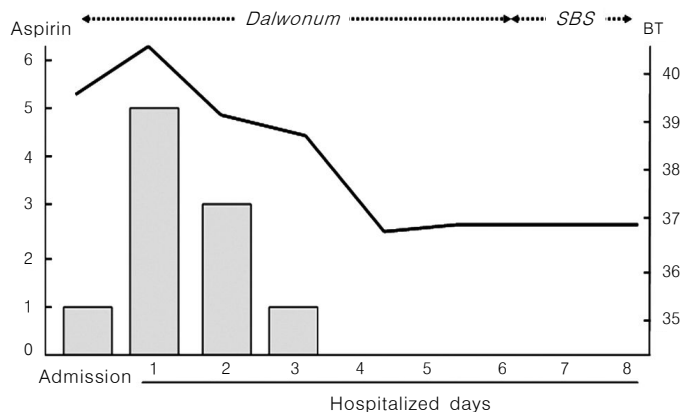
such as malaise, frank discomfort, dry mouth and anorexia were disappeared along with notarized fever. So, prescription was changed into *Samlyungbaekchoolsan* to augment her appetite (Fig. 2)

In laboratory test, WBC including differential count, serum level of AST, ALT and GGT were in normal range throughout hospital days. However, ESR and CRP were dramatically high, then only CRP was normalized with down of fever. ESR was still high by day of leaving hospital (Table 1).

Based upon positive finding from sonographic screening, multiple hepatic cysts were verified using abdomen and pelvic CT, and this examination was not performed anymore later.

## Discussion

Recent scientific investigation characterized fever



**Fig. 2.** Diagram for clinical course: Used frequency of aspirin due to high fever, the highest body temperature of indicated day, and herbal prescriptions were presented. SBS: *Samlyungbaekchoolsan*

as a cytokine-mediated rise in temperature resulting from a complex response by physiological, endocrinologic, and immunologic systems<sup>8,9</sup>. Generally, fever has three phases; the first phase inducing cutaneous vasoconstriction and muscles contraction, the second phase balancing production and loss of heat then maintaining an elevated temperature, and the third phase making cutaneous vasodilation and sweating leading to lowering body temperature<sup>10</sup>.

Basically, these modern knowledge is not much different with Oriental medicine view to fever. Fever has been recognized as a defensive response originated from competition between vital energy (正氣) of body and exogenous evil energy(邪氣). The main diseases of exogenous fever are evil chill (傷寒) or febris<sup>11</sup>. Then, *Dalwonum* has been used to treat high fever belong in febris<sup>7,12</sup>.

This patient case was supposed to belong in febris because of no typical symptom of common cold or influenza. In general, aspirin is effective to control rises of body temperature, while whole-body cooling is rarely the only effective treatment in other forms of hyperthermia<sup>13</sup>. High fever of this patient responded well to aspirin for only short term but recurrence of fever appeared during forty days before visiting Oriental hospital. Several western doctors in different clinics couldn't get accurate diagnosis then treated it as common cold-induced fever. They also examined her through all laboratory or radiologic tests. There was no specific abnormality explaining the repeated high fever as same as results in our hospital.

The blood test showed high level of CRP and ESR indicating long term inflammation in the body no matter what causes are. After taking *Dalwonum* for two days, the fever got lower, and times of aspirin use reduced. Of course, CRP rapidly reached at normal range along with disappear of fever. ESR still sustained in very high abnormality till discharge of the patient. It is guessed that mild anemia and long half-life of gamma-immunoglobulin are the reason for it.

*Dalwonum* was first described in Oriental book

called "*Onyeuckron* (溫疫論) with indications of high fever as long and repeated pattern<sup>14</sup>. This drug has been used to treat many disorders especially having high fever<sup>7</sup>. Also, one experimental report showed the pharmaceutical properties of antioxidation or hepatoprotection by this drug<sup>15</sup>. However, there are lack of scientific evidences for supporting its mechanisms or appropriate applications.

We hope that the present report could add scientific data for development of *Dalwonum* as a herbal medicine-derived anti-pyretic.

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