

## Use of hot water bottles can improve lymphocytopenia

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### ABSTRACT

We observed that patients with lymphocytopenia have a cold external body temperature—especially the abdomen, hips and extremities—as recognized by palpation. Such patients were recommended to use a hot water bottle especially for cold extremities for the purpose of improving “chill”. Six cases of lymphocytopenia diagnosed by previous medical doctors within two weeks before consulting our clinic are described in this study. The patients warmed their trunks and extremities by hot water bottles for as long as possible not only while sleeping but also during the daytime. There was no remarkable change in leukocyte count, but granulocytes significantly decreased in number (from  $6,716 \pm 4,032$  to  $5,467 \pm 2,660$ ) ( $p = 0.013$ ), and lymphocytes significantly increased from  $718 \pm 211$  to  $1,845 \pm 406$  ( $p = 0.0017$ ). It is important for clinicians to recognize that such an easy method can improve lymphocytopenia.

Medicine is equated with Western medicine in developed countries, but there are also various other forms of treatment, the so-called complementary or alternative medicines. In June 2003, our clinic was established for the purpose of integrating Western medicine with complementary or alternative ones. As a method of treatment, we recommend during the medical examination that the patient improves his/her life style according to the circadian rhythm of the autonomic nervous system (9), and take care to remove “chill” from the body. Although, “chill” is a common word in daily life and not a medical term, it is often heard by physicians when listening to a patient's description of his/her symptoms.

We encountered 14 patients with lymphocytopenia who showed less than 1,000 ( $/\mu\text{L}$ ) lymphocytes on evaluation by previous doctors at the first medi-

cal examination. We observed that all the patients with lymphocytopenia had cold external body temperatures—especially the abdomen, hips and extremities—as recognized by palpation. Lymphocytopenia was improved within one week after warming with a hot water bottle without any other medical treatment. Clinically, it is important that the lymphocytopenia can be improved by such an easy method.

Six cases of lymphocytopenia among the 14 diagnosed by previous medical doctors within two weeks before consulting our clinic were treated in this study. The patients were recommended to warm their trunks and extremities using a hot water bottle for as long as possible, not only while sleeping but also during the daytime. The number of leukocytes, granulocytes, and lymphocytes was evaluated before and after warming by a hot water bottle.

Table 1 shows the list of six patients with lymphocytopenia in our clinic, presenting gender and age distribution, underlying disease as the motive of consultation, and past treatment. After the warming treatment, there was no remarkable change in leukocyte number, from  $6,875 \pm 4,323$  to  $6,212 \pm 3,553$ . Granulocytes significantly decreased in number from

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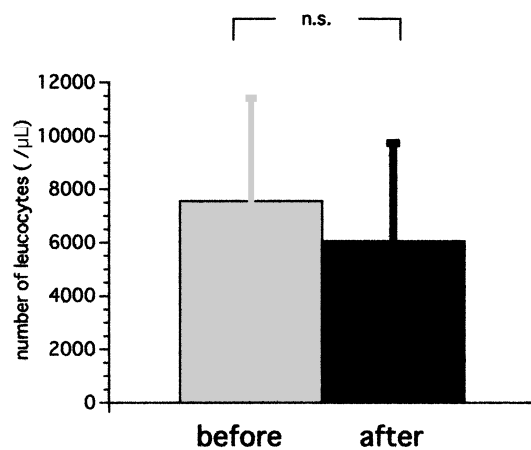
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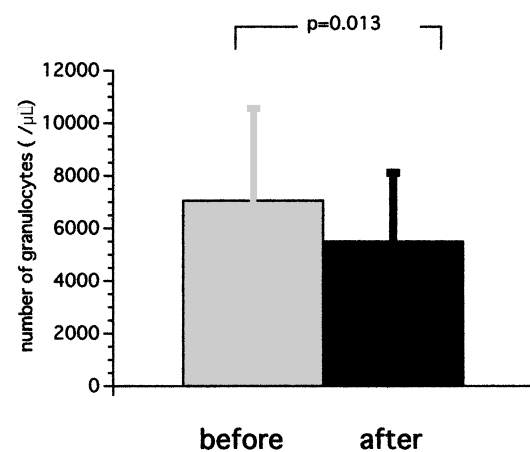
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**Table 1** List of patients

	age	gender	underlying disease	previous treatment (before our first examination)
1	28	male	atopic dermatitis	steroid ointment (6 months)
2	58	male	colon cancer with dissemination and liver metastases	surgery (17 months)
3	70	male	esophageal cancer with lung metastasis	radiation (10 months), chemotherapy (10 months)
4	58	male	multiple myeloma	none
5	44	female	breast cancer with skin metastasis	surgery (1 year), radiation (11 months) and chemotherapy (11 months)
6	48	female	breast cancer with brain and lung metastasis	immuno-cell (4 days), chemotherapy (continuing)



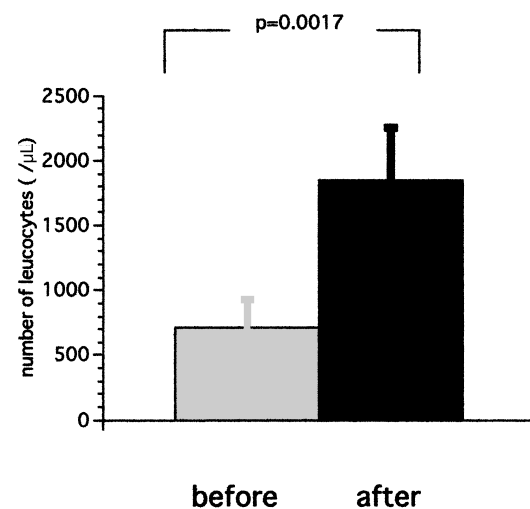
**Fig. 1** Changes in white blood cells. There was no significant change in leukocyte numbers from  $6,875 \pm 4,323$  ( $\mu\text{L}$ ) to  $6,212 \pm 3,553$  ( $\mu\text{L}$ ) after warming with a hot water bottle.



**Fig. 2** Changes in granulocytes. Granulocytes significantly decreased in number from  $6,716 \pm 4,032$  ( $\mu\text{L}$ ) to  $5,467 \pm 2,660$  ( $\mu\text{L}$ ) after warming with a hot water bottle.

$6,716 \pm 4,032$  to  $5,467 \pm 2,660$  ( $p = 0.013$ ), and lymphocytes significantly increased from  $718 \pm 211$  to  $1,845 \pm 406$  ( $p = 0.0017$ ) (Figs. 1–3). One patient (No. 5 on Table 1) showed  $395$  ( $\mu\text{L}$ ) lymphocytes which was the smallest number in this study before the warming treatment, and had an increase in lymphocytes to  $1,725$  ( $\mu\text{L}$ ) after five days of warming by a hot water bottle. Student's paired t-test was used to detect significant differences, and  $p < 0.05$  was considered significant.

The number of lymphocytes decreases not only with aging (11) after twenty years of age, but also from diseases, such as a malignant tumor, collagen disease, and with medical treatment of those diseases by medication or radiation (4). Concerning malignant tumors, a decrease in lymphocytes is observed in early as well as in advanced cancer (1). Less than  $1,000$  ( $\mu\text{L}$ ) lymphocytes is diagnosed as lymphocytopenia, which is considered an immuno-



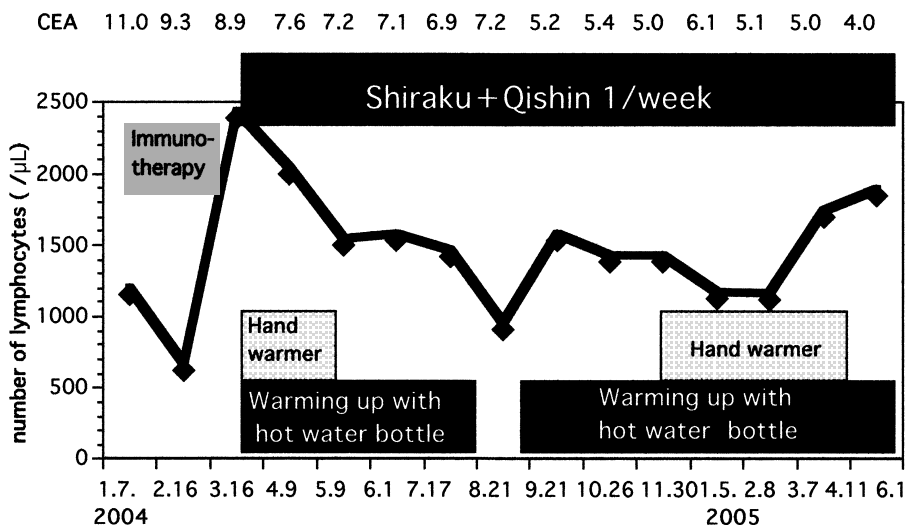
**Fig. 3** Changes in lymphocytes. Lymphocytes significantly increased from  $718 \pm 211$  ( $\mu\text{L}$ ) to  $1,845 \pm 406$  ( $\mu\text{L}$ ) after warming with a hot water bottle.

insufficient state (4). When the number of lymphocytes is maintained between 1,800 and 2,000 ( $\mu\text{L}$ ) even in advanced cancer patients for one or two years, most tumors show a reduction in size (1).

Immuno-cell therapy is generally considered useful to increase lymphocytes in patients with malignancies (3). One patient (Fig. 4) was treated with an immuno-cell therapy before consultation in our clinic. However, the number of lymphocytes decreased after several courses of the immuno-cell therapy. After warming with a hot water bottle for two days, the patient's lymphocytes increased from 670 to 2,432 ( $\mu\text{L}$ ) (5), the most rapid increase in lymphocytes in this study. The patient was treated by Shiraku and Qishin treatment once a week. Shiraku is a kind of acupuncture using an injection needle for tuberculin test, and Qishin treatment (8) is a kind of external Qigong. Carcinoembryonic antigen (CEA) exhibited high levels before this treatment, and then reduced to within normal limits during treatment. CEA gradually decreased in concentration, but increased again when lymphocytes decreased after the patient stopped warming her body with a hot water bottle. Lymphocytes increased in number after re-warming by a hot water bottle even during summer. Thus, the patient was treated by three kinds of alternative medicinal methods: warming treatment, Shiraku and Qishin treatment. We speculated that the warming treatment was the most efficacious from the point of change in CEA and lymphocyte number in this case.

Usually, we recommend that the abdomen, front of the thighs, hips, and extensor side of the upper arms should be warmed by a hot water bottle. These are equivalent to the areas showing a strong grade of "chill" on palpation. The longer the time of warmth application, the more the lymphocytes increase in number. While patients are out, we recommend using an ignition type hand warmer using benzine as a fuel as a substitute for a hot water bottle in late autumn, winter and early spring. This type of hand warmer has over ten times the thermal capacity of the disposable chemical type hand warmer, so it is more efficacious in improving "chill". If the abdomen and other parts of the body are sufficiently warmed using a hot water bottle, it is quite likely that the total amount of circulatory blood for organs will increase in volume, and organ function may improve. If a hot water bottle is placed on the lap in a consultation room, the patient feels comfortable and wishes to continue warming with the hot water bottle, and then the patient recognizes the feeling of "chill" even in midsummer.

Granulocytes have adrenergic receptors (7) and lymphocytes have cholinergic receptors (10) on each cellular surface, so they are controlled by the autonomic nervous system, sympathetic nervous system, and parasympathetic nervous system, respectively. Granulocytes increase in number under a sympathetic nerve predominant state, while lymphocytes increase in number under a parasympathetic nerve predominant state. Since blood flow increases in



**Fig. 4** Clinical course of a typical case. The most rapid increase in lymphocytes was observed in this case; lymphocytes increased from 670 ( $\mu\text{L}$ ) to 2,432 ( $\mu\text{L}$ ) after two days warming with a hot water bottle and hand warmer. Shiraku and Qishin treatment was tried in this case. CEA decreased in concentration in the clinical course, but once the patient tired of warming with a hot water bottle, CEA increased with the decrease in lymphocyte number.

volume, it creates a state similar to parasympathetic nerve predominance when warmed with a hot water bottle or ignition type hand warmer. Although “chill” was conventionally thought to be peculiar to women, it can be understood as a sympathetic nerve predominant state unrelated to gender or age. Recently, it has received attention as hypothermia in school children (2) as well as men (6) demonstrating chilliness.

Abo and Kawamura described parasympathetic nerve stimulation with acupuncture or Chinese herbal medicine as being helpful as a cure for cancer patients (1). Warming by a hot water bottle is a very practical method, and rapidly improves many uncomfortable symptoms found before warming, such as nocturia, insomnia, and lumbago. It is considered to be easy, economical, and, moreover, efficacious method of immunopotential and improvement of quality of life (QOL). For our cases, although the increase in the number of lymphocytes was seen within a few days when a patient warmed repeatedly, there were also patients whose lymphocyte number decreased when he/she tired of warming. Therefore, clinicians must check the patient’s external body temperature and advise accordingly. It may be necessary to warm up the body using various measures other than a hot water bottle to maintain an adequate external body temperature.

From the perspective of heat production and maintenance, there are many factors involved such as the contents of food and drink, the way of eating and drinking, the problem of clothes, bathing methods, and the indoor environment of the bed room that will be described and discussed in another paper. Although warming with a hot water bottle was efficacious in the improvement of numerical abnor-

malities of lymphocytopenia, it is believed that a qualitative examination will be required in the future.

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