

# A Study on Abdominal Temperature of Dysmenorrhea Patients

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## ABSTRACT

Dysmenorrhea is one of the common gynecologic disorders of menstruation women. Primary dysmenorrhea is menstrual pain without pelvic pathology, whereas secondary one is painful menstruation with underlying pathology. The cause of primary dysmenorrhea is increased endometrial prostaglandin. The mechanisms underlying secondary dysmenorrhea are not elucidated.

There are many blood vessels under the skin and they play a very important role in the thermal control of peripheral part. The control of blood circulation is mainly controlled by autonomic nervous system and it is known that D.I.T.I.(digital infra-red thermographic imaging) is an objective method showing the body temperature.

I observed the abdominal temperature of 49 patients complaining of dysmenorrhea who visited the gynecologic department of Pundang Oriental Medical Hospital during 1997. In order to rule out thermal abnormality due to obesity, the causes whose obesity index were above 1. were excluded in this study. The mean temperature of lower abdomen of the dysmenorrhea group was  $35.22 \pm 1.33^{\circ}\text{C}$  and control group was  $36.01 \pm 0.74^{\circ}\text{C}$ .

Key words : Dysmenorrhea, Cold Hypersensitivity, Abdominal Temperature, D.I.T.I.

## Introduction

Most woman has some troubles during her menstrual period. She may feel fatigue, headache, lowe back or lower abdominal pain. For those who have severe colic pain or large quantity of bleeding, some treatments must be taken to maintain their normal daily activities. The 50% of postpubertal females appeal dysmenorrhea and 10% of them are absent from their office for 1-3 days every month from it<sup>7)</sup>.

In oriental medicine, the causes of pains are

recognized 'if there is something blocked, there must be pain'. The main mechanism of menstrual pains are especially various. The stagnancy of qi and blood and the stagnancy of pathologic cold and dampness are apprehended as main mechanisms<sup>11)</sup>.

Clinically, many patients who have dysmenorrhea complain of cold hypersensitivity of the lower limbs and lower abdomen. It is well matched with the oriental medical theory mentioned above.

Until now there have been some difficulties to objectively certificating the complain of

dysmenorrhea patients. D.I.T.I(digital infra-red thermographic imaging) used on the diagnosis and observation of therapeutic progress is a diagnostic method that shows the color image about the differences of the body temperature of the painful area or the abnormal area. D.I.T.I catches the little amount of the infra-red ray from the body surface. This method is very helpful in oriental medical diagnosis, because we can measure objectively the Cold & Heat(寒熱) and their changes that are important in oriental medical diagnosis.

I have compared and evaluated the difference of abdominal temperature between each of the outpatients who visited our department of gynecology for dysmenorrhea by using D.I.T.I.

## Method

We observed 49 patients complaining of dysmenorrhea who visited the gynecologic department of Pundang Oriental Medical Hospital from Jan. 1. 1997. to Dec. 31. 1997. The control group who had no problems in the abdominal lesions were selected during the same time. In order to rule out the thermal abnormality due to obesity, the cause whose obesity index calculated by relative weight method were above I were excluded in this study.

We used the computed-aided thermography system. D.I.T.I(DOREX Co.), which was composed of 1)Thermography camera attached with the infra-red detector(Indium Antimonide, Mercury Cadmium telluride), the Scan mechanism, the Amplifier and the A/D converter, 2) Personal computer, 3) Color printer. It was operated in laboratory where the light and heat were intercepted, the low moisture and the equal temperature with normal

air flow were kept. 24 hours before the examination, we cautioned the patients to exclude the extrinsic factor. Just before the examination, we had the patients undressed for 15 minutes to adapt to the temperature of the laboratory. After the adaptation we measured the patients in 1.5 m distance.

I took the lowe abdominal temperature of the dysmehorrhea group and the control group and compared them. In dysmenorrhea group we also compared the lower abdominal temperature of primary dysmenorrhea group with the secondary one. Then we took the temperature of upper abdomen and lower abdomen of each group comparatively. The thermal difference of these areas were represented as  $\Delta T$ .

## Results

### 1. Distribution of Age

| Age        | Control Group | Dysmenorrhea |
|------------|---------------|--------------|
| Teenage    | 0             | 3            |
| 20's       | 13            | 23           |
| 30's       | 12            | 20           |
| Above 40's | 3             | 3            |
| Total      | 28            | 49           |
| Mean±S.D.  | 32±8.8        | 29±7.2       |

### 2. The Lower Abdominal Temperature

#### 1) Mean Temperature according to Age

| Age        | Control Group<br>Mean ± S. D.<br>(°C) | Dysmenorrhea<br>Group<br>Mean ± S. D.<br>(°C) |
|------------|---------------------------------------|---|
| Teenage    | -                                     | 35.37 ± 0.57                                  |
| 20' s      | 36.31 ± 0.74                          | 35.67 ± 1.23                                  |
| 30' s      | 35.83 ± 0.73                          | 34.67 ± 1.42                                  |
| Above 40's | 35.41 ± 0.70                          | 35.26 ± 1.09                                  |
| Total      | 36.01 ± 0.74                          | 35.22 ± 1.33                                  |

2) Distribution of Temperature

| Temperature (°C) | Control Group | Dysmenorrhea Group |
|------------------|---------------|--------------------|
| 38.00            | 0             | 0                  |
| 37.00-37.99      | 2             | 2                  |
| 36.00-36.99      | 14            | 13                 |
| 35.00-35.99      | 10            | 14                 |
| 34.00-34.99      | 4             | 14                 |
| 33.00-33.99      | 0             | 2                  |
| 32.99            | 0             | 4                  |
| Total            | 30            | 49                 |

3) Differences between Primary and Secondary Dysmenorrhea

| Primary Dysmenorrhea<br>Mean ± S. D. (°C) | Secondary<br>Dysmenorrhea<br>Mean ± S. D. (°C) |
|---|--|
| 35.41 ± 1.35                              | 34.83 ± 1.25                                   |

3. The Comparison of ΔT between Each Group

| Control     | Dysmenorrhea | Primary     | Secondary   |
|-------------|--------------|-------------|-------------|
| 0.28 ± 0.38 | 0.44 ± 0.63  | 0.36 ± 0.54 | 0.61 ± 0.78 |

**Discussion**

Dysmenorrhea is one of the common gynecologic disorders that affects approximately 50% of menstruating women<sup>12)</sup>. Primary dysmenorrhea is menstrual pain without pelvic pathology, whereas secondary dysmenorrhea is painful menstruation with underlying pathology. Primary dysmenorrhea usually appears within 1-2 years of menarche, when ovulatory cycles are established. The disorder affects younger women but may persist into the forties. Secondary dysmenorrhea usually develops years after menarche and can occur with anovulatory cycles<sup>6)</sup>.

The cause of primary dysmenorrhea is increased endometrial prostaglandin production<sup>2,9,10,14)</sup>. Women with primary dysmenorrhea usually have higher uterine tone, and high amplitude contraction of uterus result in decreased uterine flow<sup>1)</sup>. Vasopressin concentration are also higher in women with dysmenorrhea<sup>13)</sup>.

Secondary dysmenorrhea usually occurs years after the onset of menarche. However, by definition, secondary dysmenorrhea does not reflect age of onset but cyclic menstrual pain in association with underlying pelvic pathology. The pain of secondary dysmenorrhea often begins 1-2 weeks prior to menstrual period and persists until a few days after the cessation of bleeding. The mechanisms underlying secondary dysmenorrhea are diverse and not fully elucidated, although most involve either excess prostaglandin production or a foreign body. The most common cause of secondary dysmenorrhea is endometriosis, followed by adenomyosis and an intrauterine device.

There are many blood vessels under the skin and they play a very important role on the thermal control of the peripheral part. Within the depth of several mm under the skin surface, the blood circulation is mainly controlled by autonomic nervous system and it is known that D.I.T.I. simply shows this temperature with various colors<sup>3)</sup>.

In oriental medicine, the cause of dysmenorrhea have been ascribed to the impeded flow of qi, blood and stagnation pathologic cold or dampness. These conditions can inhibit the smooth circulation of Chong and Ren Channel which pass thru the abdominal are of women and one of its function is controlling female genital organ especially uterus.

D.I.T.I. catches the skin temperature which is radiated in the form of infra-red ranging 3-10

$\mu\text{m}$  and shows it with various colors. This technique is regarded as an objective method which shows the body temperatures in a picture with various colors<sup>8)</sup>. In addition this is a method that explains pathologic state of pain resulting from vascular mobility in an objective fashion<sup>4,5)</sup>.

The first man who used the infra-red was Hippocrates in B.C. 400. He applied a thin layer of mud on the body of patients and observed the abnormal portion of the body by investigating the dryness of the mud layer. He recognized that the radiation of body temperature was one of the important factors in diagnostic field. Then in 1800, William Herschel analyzed all the spectrum of light, and found 'infr-red ray'. It has long wave and high energy as well as being invisible to the eye. In 1948 Leo Massopurt started to use infra-red ray clinically, and in 1956 Lawson first reported the thermal changes of a breast cancer patient<sup>8)</sup>.

As mentioned above, women with primary dysmenorrhea have higher uterine tone, and high amplitude contractions of uterus result in decreased uterine flow. This corresponds to oriental medical stagnancy theory.

### **Conclusions**

In this study, abdominal temperature between women with dysmenorrhea and women who didn't have abdominal problems was analyzed. The mean temperature of square A in dysmenorrhea group was  $35.22 \pm 1.33^\circ\text{C}$  and in control group was  $36.01 \pm 0.74^\circ\text{C}$ . So it was significantly showed that lower abdominal temperature of women with dysmenorrhea was lower than control group.

### **References**

1. Akerlund M et al : Primary dysmenorrhea and vasopressin, *Pr J Obstet Gynaecol*, 86 : 484-487, 1970.
2. Chaudhuri G : Physiologic aspects of prostaglandins and leukotrienes, *Semin Reprod Endocrinol*, 3(3) : 219-30, 1985.
3. Edeiken J et al : Thermography a Reevaluation, *Skeletal Radiol* 15 : 545-548, 1986.
4. Fisher A : Documentation of Myofascial Trigger Points, *Arch Phys Med Rehabil* 69 : 286-291, 1988.
5. Goodgold J : Rehabilitation medicine, The CV Mosby Company, Saint Louis : 686-723, 1988.
6. Jonathan S : Novak's Gynecology(12th), Williams & Wilkins, Baltimore, Maryland : 408, 1996.
7. Korean Association of OB & GY : Textbook of Gynecology, Seoul, Kalvin Publishing Co. : 295-307, 1991.
8. Lawson R : Implication of Surface Temperatures in The Diagnosis of Breast Cancer, *M.A.J.* 75 : 309-310, 1956.
9. Lundstrom V et al : Endogenous levels of prostaglandin in F2 and its main metabolites in plasma and endometrium of normal and dysmenorrhic women, *Am J Obstet Gynecol*, 130 : 640-646, 1978.
10. Rapkin A et al : Dysmenorrhea. In Yaksh TL, ed. *Anesthesia*, Biologic Foundation, New York, Raven Press, 1995.
11. Song BK : Textbook of Oriental Gynecology, Seoul, Haenglim Publishing Co. : 204-210, 1990.

12. The American College of Obstetricians and Gynecologists : Dysmenorrhea, ACOG Technical Bulletin. Washington, DC., ACOG : 63, 1983.
13. The Medical Letter : Drugs for Dysmenorrhea, Med Lett Drugs, 21 : 81-84, 1979.
14. Wiqvist NE et al : The patho-physiology of primary dysmenorrhea, Res Clin Forums, 1 : 47-54, 1979.