Observation of Complete Blood Count and Biochemical Parameter after Indirect Moxibustion (CV4, CV8) in Healthy Adults

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Abstract

목적 : 본 연구는 간접구의 안전성에 대한 기초 데이터를 확보하기 위하여 수행되었다.

연구설계 : 50명의 건강한 성인을 무작위 배정으로 두 그룹으로 나누어 4주간 (일주일에 3회) 신궐혈과 관원혈에 뜸을 시술하였다. 시험군에 비하여 대조군은 열이 전달되지 않도록 단열제로 처리한 뜸으로 동일한 부위에 시술하였다. 첫 시술 1시간 전과 마지막 시술 1시간 후에 공복상태에서 채혈을 하여 혈액학적 검사를 시행하였다.

결과 : 혈액학적 검사에서 적혈구와 총 백혈구 및 백혈구의 종류별 절대수치와 상대수치에서 두 그룹 간에 특별한 차이가 없었다. 또한 혈청학적 검사에서 총 단백질, 알부민, AST, ALT, ALP, GGT, LDH, 요소질소, 크레아티닌, 총콜레스테롤 및 중성지방의 비교에서도 그룹 간에 차이가 없었다.

결론 : 본 연구는 건강한 사람에서 간접구의 시행 후 혈액학적 안전성을 처음으로 보고하는 것으로서, 향후 뜸의 연구를 수행시 중요한 비교 자료로 사용될 수 있을 것이다.

Key words : Moxibustion, Clinical study, CV4, CV8, Korean traditional medicine

Introduction

Moxibustion therapy is to burn the fluff of mugwort on specific point on a patient's skin as purpose of treatment or prevention of diseases, and this therapy plays an important role in the traditional Korean medicine[1]. Moxibustion is regarded as a prospective treatment for chronic disease condition accompanying with weak or cold symptom. Recently, moxibustion therapy is attracting great attention worldwide[2].

Korean Health Industry Development Institute reported that moxibustion is third popular Oriental therapy in 2007[3]. Korean national health insurance paid over 27 billion won for health service with moxibustion treatment in 2008[4]. 67% of Oriental doctors use moxibustion for their medical practice, and Oriental doctors pointed out the therapeutic efficacy and positive response from patients as the biggest advantage of moxibustion treatment[5,6]. These facts indicate the importance of research and development of

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traditional moxibustion therapy.

The moxibustion therapy-associated researches have been done so far. However they are still very deficient relatively to researches for acupuncture which is another main Oriental therapy[7]. In particular, moxibustion therapy is sometimes regarded as a folk remedy due to the popular use of it by both Oriental doctor and non licensed practitioner without precise proofs[8]. The current medical importance of evidence-based medicine strongly demand scientific data derived from clinical research[9,10].

This study aimed to provide a basic data regarding to safety of indirect moxibustion using human blood cell count and biochemical parameters. This result would be a valuable reference in further clinical study for moxibustion application.

Subjects and methods

1. Subjects and randomization

Healthy adults without night work, alcohol drink, smoke, any medicine use, and over weigh were recruited. Subjects with abnormality in hematological and radiological test were excluded. Finally, 50 subjects (15 men and 35 women) were included (median age 46.5 years, range 20-65 years). Subjects were allocated into either the control group (10 men and 15 women, median age, 42 years) or the experimental group (5 men and 20 women, median age 47 years) by block randomization. Informed consent was obtained from each subject, and the ethical committee of Daejeon University Hospital approved the study protocol.

2. Study design and indirect moxibustion treatment

A licensed doctor performed the indirect moxibution at two acupoints (CV4 and CV8) 3 times (every other day) per week for 4 weeks. One moxa corn (3.5 g of wormwood fiber, KyeGoo Inc., Incheon, Korea) for each point (CV4 and CV8) was burnt for 30 min per performance. For the control group, moxa having a heat insulator was used (Fig 1). The infrared lamp was applied to both groups as minimal level for keeping abdomen warmth.
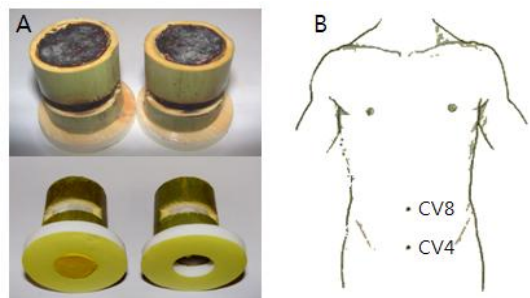

Fig. 1. Feature of moxa corn (A) and locations for treatment of indirect moxibution (B)

3. Measurement of complete blood count and biochemical parameter

Blood samples were taken from each subject 1 h before the first moxibustion and 1 h after the final moxibustion treatment. From these samples, complete blood count including red blood cell count, white blood cell count with differential count, platelet count, and levels of hemoglobin and hematocrit were determined using auto hematoanalyzer (Celltack-α, Nihon, Japan). Erythrocyte sedimentation rate was also determined.

Blood biochemical parameters including total protein, albumin, aspartate aminotranferase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP), gamma-glutamyl transpeptidase (GGT), lactate dehydrogenase (LDH), creatinine, blood urea nitrogen (BUN), total cholesterol, triglyceride, and glucose were determined using chemistry analyzer (AU 400, Olympus, Japan).

4. Statistical analysis

Changes in complete blood count and biochemical parameter were compared between experimental and control group before and after moxibustion. Results were analyzed with independent two-sample t-tests using PASW Statistics 17 program. Statistical significance was defined as $p < 0.05$.

Results

1. Observation of Complete Cell Count

The value of all blood cell parameter were within normal level for every subject at beginning time point. No significant changes of value in red blood cell count, white blood cell count, differential count, platelet count, hemoglobin, hematocrit, and erythrocyte sedimentation rate were observed in both groups between before and after experiment time points (Table 1).

2. Observation of Biochemical Parameter

As an expectation, every blood biochemical parameter was within normal level for all subjects at beginning time point . There was no significant changes between before and after experiment time points for value of total protein, albumin, aspartate aminotranferase, alanine aminotransferase, alkaline phosphatase, gamma-glutamyl transpeptidase, lactate dehydrogenase, creatinine, blood urea nitrogen, total cholesterol, triglyceride, and glucose in both groups (Table 2).

Table 1. Change of Complete Cell Count

Hematological parameter	Before		After	
	Control	Moxibustion	Control	Moxibustion
White blood cell (K/ul)	62.3 ± 30.3	56.3 ± 11.6	59.3 ± 18.6	57.6 ± 11.8
Differential Counting (%)				
Neutrophils	61.8 ± 10.0	57.4 ± 7.3	61.0 ± 9.4	58.8 ± 8.5
Lymphocytes	34.8 ± 9.6	39 ± 7.1	36.5 ± 9.3	38.1 ± 9.2
Monocytes	3.4 ± 1.1	3.6 ± 1.1	2.5 ± 0.8	2.3 ± 0.9
Red blood cell (M/ul)	464 ± 40.4	449.1 ± 36.1	453.2 ± 33.2	439.9 ± 36.6
Hemoglobin (g/dℓ)	14.6 ± 1.8	14.1 ± 1.2	13.9 ± 1.6	13.6 ± 1.1
Hematocrit (%)	41.9 ± 4.8	40.7 ± 3.3	40.7 ± 3.8	39.7 ± 3.0
MCV (fL)	90.2 ± 5.6	90.7 ± 2.9	89.7 ± 5.3	90.1 ± 2.7
MCH (pg)	31.3 ± 2.4	31.4 ± 1.1	30.7 ± 2.3	29.9 ± 5.7
MCHC (g/dℓ)	34.7 ± 0.8	34.7 ± 0.7	34.2 ± 0.9	34.3 ± 0.6
ESR (㎜/hour)	9.0 ± 8.9	11.4 ± 7.6	13.5 ± 10.6	13.0 ± 8.0
Platelet (K/ul)	25.5 ± 5.6	24.0 ± 4.6	24.6 ± 5.0	23.4 ± 5.2

MCV: Mean cell volume, MCH: Mean cell hemoglobin, HCHC: Mean corpuscular hemoglobin concentration, ESR: Erythrocyte sedimentation rate

Table 2. Change of Biochemical Parameter Values

Biochemical values	Before		After	
	Control	Moxibustion	Control	Moxibustion
Total protein (g/dℓ)	7.7 ± 0.4	7.6 ± 0.3	7.5 ± 0.5	7.5 ± 0.4
Albumin (g/dℓ)	4.6 ± 0.2	4.6 ± 0.2	4.5 ± 0.2	4.5 ± 0.2
Alkaline phosphatase (U/L)	68.3 ± 16.6	67.5 ± 19.4	67.6 ± 18.6	65.7 ± 17.4
AST (U/L)	24.4 ± 5.7	22.2 ± 5.9	24.4 ± 5.7	22.2 ± 5.9
ALT (U/L)	22.6 ± 7.6	19.6 ± 8.1	22.0 ± 9.7	18.4 ± 7.2
GGT (U/L)	22.6 ± 11.7	18.9 ± 8.4	24.8 ± 14.8	18.8 ± 8.4
Lactate dehydrogenase (LDH)	171.2 ± 30.8	172.1 ± 33.6	151.3 ± 20.3	143.2 ± 25.1
Creatinine (㎎/dℓ)	0.9 ± 0.1	0.9 ± 0.2	0.9 ± 0.1	0.8 ± 0.2
Blood urea nitrogen (㎎/dℓ)	12.6 ± 4.5	13.5 ± 3.0	13.6 ± 4.1	12.9 ± 3.1
Total cholesterol (㎎/dℓ)	195 ± 38.4	199.4 ± 46.7	189 ± 47.9	203.6 ± 40.4
Triglycerides (㎎/dℓ)	130.8 ± 70.0	149.6 ± 101.5	113.3 ± 58.5	122.3 ± 65.4
Glucose (㎎/dℓ)	93.0 ± 11.9	97.1 ± 15.0	89.5 ± 14.2	93.6 ± 12.2

AST: Aspartate aminotranferase, ALT: Alanine aminotransferase, GGT: Gamma- glutamyl transpeptidase. * ; Significantly different from values of control group as $P < 0.05$

Discussion

Herbal drug, acupuncture, and moxibustion therapy have been three main treatments in traditional Korean medicine. Moxibustion treatment has been thought to provide warm energy, expel cold-damp stagnation, and enhance immunity through long clinical experience[11]. Moxibustion has been applied to chronic pathologic status, and especially showed positive clinical effects on diverse coldness-associated symptoms[12-15].

Over than 50 clinical trials by 2009 have been conducted to study the effects of moxibustion using various pathologic condition groups[2,7]. However, there was

no clinical experiment focussed on blood circumstance during moxibustion treatment to normal subjects. This study first presented whether/how moxibustion on CV4 and CV8 for four weeks affect blood cell account and biochemical parameters. The blood cell count and various biochemical parameters were very slightly changed within extremely narrow range. Erythrocyte sedimentation rate showed the moderate alteration into increasing direction, but the change was observed in both groups and without statistical significance.

Several previous studies showed the increase of B lymphocytes, and activation of NK cell and macrophage by moxibustion treatment[16-18]. However, all of those are animal-based results. Partially, some clinical studies revealed the immunemodulating effects such as prevention of nosocomial infection, treatment of chemotherapy-induced leukopenia, and late stage malignant tumor[19-21].

Generally, acupuncture or moxibustion effects would be variable depending on the method of moxibustion, location of treatment, stimuli quantity including duration, and sometimes practitioner. CV4 and CV8 is acupoints which Oriental doctors frequently choose for moxibustion[5]. One clinical study showed a significantly positive outcome for treatment of primary dysmenorrhea by indirect mixibustion at same acupoints, CV4 and CV8[14]. But, they didn't measure any blood-derived parameters.

Although no change was observed, this study produced a objective data of blood parameters in healthy condition subjects. This result may have a limitation of interpretation because of doubt whether measurements of this study represent any change by indirect moxibustion. However, this result would be an important data for other clinical study regarding to basic reference in normal condition. For example, this data could be an useful standard for further study such as mechanism of moxibustion or improvement of quality of life of healthy people in the future.

Indirect moxibustion is commonly believed to be safe, but no scientific data present so far. This result is a first safety evidence of repeated moxibustion at CV4 and CV8 for four weeks. It is also hope that moxinustion-related clinical study becomes more augmented and then supports development of novel moxinustion therapy in traditional Korean medicine.

Conclusion

Through the observation of complete blood count and biochemical parameters from randomized controlled clinical trial of indirect moxibustion at CV4 and CV8 for four weeks using 50 healthy subjects, following results were obtained.

1. The absolute and relative number of peripheral blood cell count was not changed between before and after data in both groups.
2. Any significant change was not observed in biochemical parameters in both groups.
3. This is a first safety evidence of repeated moxibustion at CV4 and CV8 for four weeks.

Taken together, this result could be valuable as a references data for further clinical study using moxibustion.

Acknowledgment

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