

Original Article

## Study of Characteristics of Patients with Hyperhidrosis

Chang-Gue Son

Liver and Immunology Research Center, Oriental Medical College, Daejeon University

**Objectives:** This study was aimed to establish the clinical features of the patients suffering from hyperhidrosis, who are willing to visit Oriental clinics.

**Methods:** Forty-six patients with primary hyperhidrosis were enrolled in this study classification, body part of perspiration and its severity, and constitutional differentiation were analyzed.

**Results:** 85.1% of patients were 10 to 39 years old. The body part most complained of hyperhidrosis was the hands and feet at 50%. The portion of *Teaemin*, *Soumin*, and *Soyangin* was 56.6% 21.1%, and 21.7% respectively. *Soumin* specifically showed a higher frequency of palmar and plantar hyperhidrosis as 90%. The average score of symptoms was  $5.1 \pm 1.7$  by a 10-point self-reporting numeric rating scale (NRS). No statistical difference of NRS score was observed regarding gender, *Sasang* classification, or hyperhidrosis region.

**Conclusions:** This study provides an overview of hyperhidrosis patients visiting an Oriental clinic, and will be helpful in establishing a strategy for the Korean medicine (KM)-based therapeutic development.

**Key Words** : Hyperhidrosis, Korean medicine, herbal medicine

### Introduction

Hyperhidrosis is defined as excessive perspiration in various parts of the body, usually including hands, feet, armpits, groin, and neck area due to the relatively high concentration of sweat glands<sup>1</sup>. Hyperhidrosis sufferers usually have some impairment of daily activities, social interactions and occupational activities such as securely grasping objects, sports, handshake, or playing musical instruments<sup>2</sup>.

This disorder is classified into primary or secondary hyperhidrosis. Primary hyperhidrosis has an estimated prevalence of nearly 3% and usually shows focal hyperhidrosis<sup>3</sup>. It generally

starts during or before adolescence and seems to be inherited as an autosomal dominant genetic trait, and is associated with significant medical and psychosocial consequences<sup>4</sup>. Secondary hyperhidrosis involves the whole body and results from an underlying condition such as dysfunction of thyroid or pituitary glands, menopause, diabetes mellitus, or tumorous diseases<sup>5</sup>.

Hyperhidrosis can be somewhat managed by non-surgical or surgical treatments including antiperspirants, iontophoresis, cholinergic inhibitor drugs, botulinum toxin, and sympathectomy<sup>6-8</sup>. However, all current therapeutics have the limits due to low efficacy, recurrence, or side-effects such as compensatory sweating<sup>9,10</sup>. Many

• Received : 12 November 2012

• Revised : 4 December 2012

• Accepted : 4 December 2012

• Correspondence to : Chang-Gue Son

Liver and Immunology Research Center, Daejeon Oriental Hospital of Daejeon University, 22-5 Daehung-dong, Jung-gu, Daejeon, 301-724, Republic of Korea.

Tel : +82-42-229-6807, Fax : +82-42-257-6398, Email : ckson@dju.ac.kr

hyperhidrosis sufferers in Korea instead choose traditional Korean medicines (KM). Several reports have presented KM-based diagnosis and positive clinical outcomes<sup>11,12</sup>. However, there is lack of study regarding the epidemiology and characterization of patients to help in the development of a KM-based therapeutic strategy.

This report aimed to produce a symptomatic characterization of hyperhidrosis patients who visited an Oriental hospital.

## Methods

### 1. Subjects and study design

This study was designed as a pilot study to characterize patients with hyperhidrosis. 46 patients (33 male and 13 female, median age 27.5 years, age range 14 to 63) who visited the Internal Medicine-Immune Center of Daejeon University Hospital were involved. The body parts of excessive sweating, severity of complaint and *Sasang* classification were recorded and analyzed.

### 2. Data collection and statistical analysis

All patients were requested to indicate the severity in discomfort of life activity due to the hyperhidrosis via a numeric rating scale (NRS)

having a 10-point score, the zero (0) score indicating “no inconvenience” and the nine score representing “completely impossible to conduct regular activity”. *Sasang* constitution was analyzed using QSCC II, and the symptom differentiation was diagnosed by a doctor based on Korean medicinal theory. Data comparisons between males and females, or among *Sasang* constitution and symptom differentiation were analyzed by t-test or  $\chi^2$ -test (chi-square test) using PASW Statistics 17 program.

## Results

### 1. Body parts of hyperhidrosis

The most complained-of body part with hyperhidrosis was the hands and feet at 50% of total patients (male 30.4% vs. female 30.8%). The second site of hyperhidrosis was the whole body at 23.9% (male 69.6% vs. female 53.8%) while the third site was head and face at 19.6% (male 30.4% vs. female 15.4%). No statistical significance between men and women was observed using  $\chi^2$ -test analysis ( $p > 0.05$ ). The rate for groin and armpits were 4.3% and 2.2% respectively. The majority of patients (85.1%) were aged from 10 to 39 years old (Fig. 1).

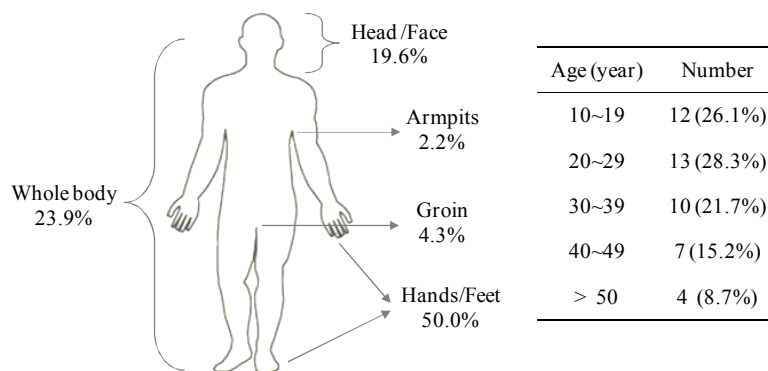


Fig. 1. Body parts of hyperhidrosis and age distribution of patients

**Table 1.** Body parts of hyperhidrosis according to *Sasang* type, and its NRS score

Body parts	NRS score	<i>Teaeumin</i>	<i>Soumin</i>	<i>Soyangin</i>	Chi-square test
Total N. (%)	5.1±1.7	26 (56.6)	10 (21.7)	10 (21.7)	
Male	4.9±1.7	18 (69.2)	7 (26.9)	8 (30.8)	P-value
Female	5.6±1.6	8 (61.5)	3 (23.1)	2 (15.4)	0.514
Whole body	5.9±2.0	7	1	3	
Hands and feet	4.7±1.8	9	9	5	
Head and face	5.0±1.0	7	0	2	P-value
Groin	5.0±0.0	2			0.341
Armpits	5.5±0.7	1			
NRS score		5.1±1.5	4.9±2.1	5.3±1.9	

Pearson's chi-square test was used for comparing the frequency of hyperhidrosis site according to the *Sasang* classification.

## 2. Classification of patients by *Sasang* constitution

The *Sasang* constitutional classification of patients was 56.6%, 21.1%, and 21.7% for *Teaeumin*, *Soumin*, and *Soyangin* respectively. The male patients were 69.2%, 26.9%, and 30.8% versus 61.5%, 23.1%, and 15.4% of females respectively.  $\chi^2$ -test didn't show a significant difference according to gender ( $p > 0.05$ ). Among *Sasang* constitutional classification, the frequency rate of hyperhidrosis site was not statically significant ( $p > 0.05$ , Table 1).

## 3. Severity of hyperhidrosis symptoms

For all patients, the average NRS score of hyperhidrosis symptom was 5.1±1.7. There was no significant difference of NRS score among *Sasang* constitutional classifications at 5.1±1.5, 4.9±2.1, and 5.3±1.9 for *Teaeumin*, *Soumin*, and *Soyangin* respectively ( $p > 0.05$ ). NRS scores were not significantly different according to gender (male 4.9 vs. female 5.6) or the hyperhidrosis sites of minimally 5.0±1.0 for head and face to maximally 5.9±2.0 for the whole body respectively (Table 1).

## Discussion

In this study, all patients belonged in primary hyperhidrosis, in that they first recognized their

physical symptom from adolescence (data not shown). They also reported aggravation of symptoms under the status of anxiety, tension or severe fatigue. It is well known that it is exacerbated by sympathetic overactivity<sup>13</sup>. One group presented that hyperhidrosis patients are closely associated with the Yang syndrome under KM-based diagnosis<sup>14</sup>.

The prevalence rate of hyperhidrosis was significantly higher among individuals in the prime working-age population. The median age of patients was 27.5 years, and 85.1% of patients in this study were 10 to 39 years old. In general, axillary hyperhidrosis is the most frequent complaint among the general population<sup>15</sup>, however, the first most common site of this study was the palmar and plantar at 50.5%. This difference could come from the study population. Even though hyperhidrosis affects most frequently the axillary region, the patients having excessive sweating at palmar and plantar locations visit the Oriental clinics due to negative influence on life activity. Primary hyperhidrosis is known to generally affect a local part of the body, but 23.9% of patients indicated the sweating symptom over the whole body.

This study investigated any difference of hyperhidrosis pattern regarding to the *Sasang* constitution. The *Sasang* classification is mainly

determined by the functional balance between excessive and deficient organ functions, and then usually characterizes the physiopathological features including sweating pattern or susceptibility of disorders<sup>16)</sup>. One study reported that *Taeumin* more easily show perspiration compared with others from 504 patients visiting one Oriental hospital<sup>17)</sup>. In addition, Koreans generally consist of 46.9%, 24.0% and 29.1% for *Taeumin*, *Soumin*, and *Soyangin* respectively<sup>18)</sup>. In this study, 56.2% of patients belonged in *Taeumin*; this result is higher than the 46.9% of general population. Nevertheless, no statistically significant difference was observed between the general population and the subjects of this study ( $p = 0.366$ , data not shown). The *Sasang* classification didn't affect the hyperhidrosis regions under Pearson's chi-square analysis ( $p = 0.341$ ), but *Soumin* showed the typically a higher rate of hands and feet hyperhidrosis than the other two constitutions. *Soumin* commonly have the cold trait, especially on hands and feet<sup>19)</sup>.

The dermatology life quality index (DLQI) is usually used for the subjective assessment of symptomatic severity in hyperhidrosis study<sup>20)</sup>. However, this study adapted the 10-point NRS score to estimate the symptomatic disturbance of regular life activity. The symptom severity of patients visiting an Oriental clinic was  $5.1 \pm 1.7$  on NRS. No significant difference of NRS score was observed according to the *Sasang* classification, gender or sweating body parts.

The various treatments can somewhat manage hyperhidrosis using antiperspirants, iontophoresis, cholinergic inhibitor drugs, botulinum toxin, or surgical sympathectomy, however all treatments have side-effects such as compensatory sweating<sup>21)</sup>. Therefore, many patients choose KM-derived treatments, the effectiveness of which has been scientifically proven by clinical studies<sup>22,23)</sup>. In aspect of high prevalence of

hyperhidrosis and its unsatisfactory therapies, hyperhidrosis could be a clinical target of KM medicine.

In summary, this study has limitations such as small number of patients and incompletely objective observation after treatments. However, this study produced an important overview showing the clinical features of hyperhidrosis patients who are willing to visit Oriental clinics. This finding could be helpful to establish a strategy for KM-based treatment and therapeutic development.

### Acknowledgement

This study was supported by a grant from the Oriental Medicine R&D Project, Ministry of Health & Welfare(B100045), Republic of Korea.

### References

1. Wang R, Solish N, Murray CA. Primary focal hyperhidrosis: diagnosis and management. *Dermatol Nurs.* 2008;20(6):467-70.
2. Lee DY, Hwang JJ. Hyperhidrosis and Its Treatment. *J Korean Med. Association.* 2005; 48(8):757-63.
3. Walling HW, Swick BL. Treatment options for hyperhidrosis. *Am J Clin Dermatol.* 2011;12(5): 285-95.
4. Aini IF, Zamrin DM, Joanna OS, Hairulfaizi H, Ramzisham AR. Familial primary hyperhidrosis: a disabling social disease. *Clin Ter.* 2010;161(5): 459-60.
5. Walling HW. Clinical differentiation of primary from secondary hyperhidrosis. *J Am Acad Dermatol.* 2011;64(4):690-5.
6. Nyamekye IK. Current therapeutic options for treating primary hyperhidrosis. *Eur J Vasc Endovasc Surg.* 2004;27(6):571-6.

7. Doft MA, Hardy KL, Ascherman JA. Treatment of hyperhidrosis with botulinum toxin. *Aesthet Surg J.* 2012;32(2):238-44.
8. Wolosker N, de Campos JR, Kauffman P, de Oliveira LA, Munia MA, Jatene FB. Evaluation of quality of life over time among 453 patients with hyperhidrosis submitted to endoscopic thoracic sympathectomy. *J Vasc Surg.* 2012; 55(1):154-6.
9. Coutinho dos Santos LH, Gomes AM, Giraldi S, Abagge KT, Marinoni LP. Palmar hyperhidrosis: long-term follow-up of nine children and adolescents treated with botulinum toxin type A. *Pediatr Dermatol.* 2009;26(4):439-44.
10. Stefaniak T, Cwigan M, Laski D. In the search for the treatment of compensatory sweating. *Scientific World Journal.* 2012;134547.
11. Lee SH, Rhee HK, Jung HJ, Jung SK, Jung SY, Roh YL, Kim JH. Correlation between Oriental Medicine Diagnosis and the Autonomic Nervous System Functions of Hyperhidrosis Patients. *J. Oriental Internal Medicine.* 2008 29(2):359-74.
12. Yeon Kyoung-Jin, Kim Chang-Hun, Roh Seok-Seon. The Effect of Yangshimtang-Gamibang on 4 Cases of Hyperhidrosis of the Palms and Soles. *J. Korean Orient Med Ophtha and Otolary and Derma.* 2005; 18(3):135-41.
13. Senard JM, Simonetta-Moreau M, Tran MA. Blood pressure and heart rate variability in patients with essential hyperhidrosis. *Clin Auton Res.* 2003;13(4):281-5.
14. Lee SH, Kim JH, Roh YL, Rhee HK, Jeong SY, Jung SK, Jung HJ. Correlation between Oriental Medicine Diagnosis and the Autonomic Nervous System Functions of Hyperhidrosis Patients. *Korean J. Orient.Int. Med.* 2008;29(2):359-74.
15. Strutton DR, Kowalski JW, Glaser DA, Stang PE. US prevalence of hyperhidrosis and impact on individuals with axillary hyperhidrosis: results from a national survey. *J Am Acad Dermatol.* 2004;51(2):241-8.
16. Hwang MW, Lee TG., Lee SK, Song IB, Choe BK, Koh BH. The case-control study of ischemic stroke according to Sasang constitution. *J Korean Orient Med* 2006;27:118-29.
17. Choi JY, Lee YS, Park SS. The characteristics of perspiration according to Sasang constitution. *J. Korean Oriental Med.* 2002; 23(4):186-95.
18. Lee TG, Hwang MW, Ham TI, Lee SK, Choe BK, Koh BH, et al. A study on distribution rate of Sasangin in Korea. *J Sasang Const Med.* 2005;17:12-21.
19. Cho JH, Yoo SR, Cho JK, Son CG. Analytic Study for Syndrome-differentiation and Sasang-constitution in 72 Adults with Chronic Fatigue. *Korean J. Orient. Int. Med.* 2007;28(4): 791-6.
20. Finaly AY, Khan GK. Dermatology Life Quality Index (DLQI): A simple practical measure for routine clinical use. *Clin Exp Dermatol.* 1994;19:210-6.
21. Vorkamp T, Foo FJ, Khan S, Schmitto JD, Wilson P. Hyperhidrosis: evolving concepts and a comprehensive review. *Surgeon.* 2010;8(5): 287-92.
22. Lee SH, Roh YL, Hwang JH, Jung SY, Jung SK, Jung HJ. Assessment of Quality of Life in 26 Patients with Primary Hyperhidrosis before and after Oriental Medicine Treatment. *J. Oriental Internal Medicine.* 2007; 28(3):597-607.
23. Kim KI, Lee HB, Choi KH, Jung SK, Jung HJ. A Case Series Report on 11 Patients of Primary Palmar/Plantar Hyperhidrosis in Children and Adolescents Treated with Hospitalization Program of a Hyperhidrosis Clinic. *Korean J. Orient. Int. Med.* 2012;33(3)327-37.