Original Article

Perception of cold and heat pattern identification in diseases: a survey of Korean medicine doctors

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ABSTRACT

Background: This study aimed to investigate the extent to which Korean Medicine doctors consider cold and heat pattern identification when prescribing herbal treatment for a disease.

Methods: A survey was sent by e-mail to 15,841 members of the Association of Korean Medicine for whom member information was registered. Of these, 699 (4.4%) members participated in the survey. The survey included questions regarding the frequency of use of cold and heat pattern identification in deciding a herbal treatment prescription, the diseases for which cold and heat pattern identification-related herbal treatment was most efficacious, the type of herbal treatment prescribed, and the duration of the treatment.

Results: Of the 699 respondents, 591 (84.5%) reported that they considered cold and heat when prescribing herbal treatment. The diseases for which consideration of cold and heat patterns was effective were, in order, menopausal disorder (124, 18.3%), chronic rhinitis (98, 14.5%), dyspepsia (94, 13.9%), hwa-byung (92, 13.6%), diarrhea (83, 12.3%), dysmenorrhea (61, 9.0%), headache (59, 8.7%), inflammation in the digestive tract (58, 8.6%), coldness in hands and feet (58, 8.6%), and atopic dermatitis (55, 8.1%). The typical treatment duration differed widely for different diseases: atopic dermatitis was most frequently treated for >2 months (38, 34.5%), whereas diarrhea was most frequently treated for ≤ 10 days (73, 43.6%).

Conclusion: These findings indicate that cold and heat pattern identification is a useful tool employed by Korean Medicine doctors. This study may provide a basis for clinical research investigating the effect of pattern identification-based treatment of diseases.

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1. Introduction

Pattern identification (PI) is the most representative diagnostic system in traditional Asian medicine and distinguishes it from Western medicine. Not all types of treatment within Korean Medicine (KM) require PI; however, it is common that Korean Medicine doctors (KMDs) consider PI when treating a disease, and particularly when prescribing herbal treatment.[1]

Recently, as an evidence-based approach has been emphasized in KM, prospective research studies have been conducted on KM treatments. Compared with other types of studies (e.g., investigation of the effect of a specific medicine or herbal treatment in a specific disease), prospective clinical research studies, including randomized controlled trials (RCTs), are difficult to conduct on PI as the model is not easy to validate and the results cannot be generalized. Nevertheless, prospective clinical studies (including RCTs) on PI in stroke, obesity, and the common cold have been conducted or are currently being planned in Korea.[2–5] However, there are a variety of PI types, and even within one type of PI, further classifications can be made. Therefore, it is very difficult to match the type of PI to a disease in which a PI approach is effective.

Of the various PI types, cold and heat is one of the eight-principle PI components and has been used as an important tool in KM to identify the status and physical constitution of patients as well as the nature of the disease. Cold and heat is also used for medicine classification as a way to categorize the characteristics of traditional herbal treatments.[6–8] Moreover, recent studies, ranging from basic experimental studies to clinical investigations, have focused more on cold and heat than on other types of PI. Thus, research on cold and heat is significant in the overall field of PI research in KM.[9–11]

Therefore, in this study we aimed to conduct a preliminary study as a basis for prospective clinical research on cold and heat PI (CHPI). Specifically, we aimed to identify the diseases that had good outcomes when treated with herbal medicine after consideration of CHPI, to examine the typical duration of such treatment, and to investigate herbal treatments frequently prescribed for cold and heat patterns, respectively, by conducting surveys on KMDs.

2. Methods

2.1. Study design and variables

The study was conducted between September 25, 2015 and October 26, 2015, by e-mailing the survey to KMDs registered with the Association of Korean Medicine (AKOM).

Through the survey, we aimed to investigate the extent to which KMDs consider the elements of cold and heat when prescribing herbal treatment, their practices for prescribing herbal treatment, and the frequency with which CHPI is considered per disease (or symptom). Additional questions included in the survey were related to the diseases most effectively treated with CHPI-based herbal prescriptions and the most frequently used herbal treatment in CHPI. Lastly, information on the general characteristics, such as sex, age, year of certification, workplace, type of certification, and education level, was collected.

As the scope of a disease is very wide, there are many variations in specific details, even within a disease. Additionally, as the respondents were limited in the detail they could give in the answers in the e-mail survey, we restricted the diseases by presenting a list of disease items selected with reference to the results from the Korean Medicine Health Care Utilization and Herb Consumption survey.[12] Additional revisions were made to the list by removing diseases with a very low frequency of treatment using KM and diseases for which RCT or other prospective clinical studies have already been conducted or are currently being planned in Korea (e.g., obesity, stroke, infertility, common cold). Furthermore, because there are many diverse herbal treatments, we provided a list of 128 herbal treatments that we had selected from the frequently used herbal treatments and granules commercially available in the survey.[12]

In addition, at the end of each list, a space was provided so that the respondents could respond open-endedly about a disease or herbal treatment not shown on the list.

The study was conducted in cooperation with AKOM. We did not collect personal identifiable information, such as telephone numbers, names of individuals or institutions, or addresses. The survey respondents voluntarily participated in the study and gave their consent to data collection for the purpose of scientific research.

2.2. Study size

The study was conducted involving 15,841 AKOM members whose working e-mail addresses were registered in the database in 2015. The sample size required was determined so that the maximum tolerable error rate would be 5% with a 95% confidence interval. Calculation was performed using the following equation:

$$n = pq \left(\frac{z_{\alpha/z}}{d} \right)^2 \tag{1}$$

where α = significance level; p = proportion; $q = 1 - p$; d = tolerable error rate.

With $p = 0.5$, i.e., the proportion under the null hypothesis, $n = 0.5 \times 0.5 \times \left(\frac{1.96}{0.05} \right)^2 = 384.16$, which was rounded up to 385. Accordingly, we planned to have a sample of at least 385 respondents to the survey within a defined period (between September 25, 2015 and October 26, 2015).

2.3. Statistical analysis

Frequency was analyzed for each survey item using SPSS version 21.0 for Windows (IBM Corp., Armonk, NY, USA).

3. Results

3.1. General characteristics

E-mails were sent to 15,841 members whose working e-mail addresses were registered with AKOM. In total, 699 members responded (response rate = 4.4%) to the e-mails. Of these, 586 (83.8%) were male and 113 (16.2%) were female respondents.

Table 1 – General characteristics of the study members

Category		n	%
Sex	Male	586	83.8
	Female	113	16.2
Age (y)	20–29	50	7.2
	30–39	240	34.3
	40–49	276	39.5
	50–59	109	15.6
	> 60	24	3.4
Clinical experience (y)	0–5	143	20.5
	5–10	161	23.0
	10–15	159	22.7
	15–20	116	16.6
	> 20	120	17.2
KM doctor qualification[*]	General practitioner	509	69.6
	Specialist	184	25.2
	Certified physician (Association)[†]	19	2.6
	Certified physician (Society)[‡]	19	2.6
Education[*]	Bachelor's degree	306	43.2
	Master's degree	147	20.7
	Doctoral degree	235	33.1
	Other fields Master/Doctor	21	3.0
Place of work	KM clinic	526	75.3
	KM hospital	113	16.2
	Other fields	7	1.0
Total	699	100	

[*] Redundancy selection.
[†] Certified by the Association of Korean Medicine.
[‡] Certified by the Society of Korean Medicine.
 KM = Korean medicine.

The largest age group was between 40 years and 49 years ($n = 276$; 39.5%), followed by the age group between 30 years and 39 years ($n = 240$, 34.3%), and between 50 years and 59 years ($n = 109$, 15.6%). In terms of clinical experience, most respondents had 5–10 years of experience ($n = 161$; 23.0%), followed by 10–15 years ($n = 159$, 22.7%), and 0–5 years ($n = 143$, 20.5%). With regard to certification type, there were 509 (69.6%) general practitioners and 184 (25.2%) specialists. With regard to education level, there were 306 (43.2%) respondents with a bachelor's degree, 147 (20.7%) respondents with a master's degree, and 235 (33.1%) respondents had a doctoral degree. In total, 526 (75.3%) respondents worked at a KM clinic, 113 (16.2%) worked at a KM hospital, and seven (1%) respondents worked at other places (i.e., research institutes, universities; Table 1).

3.2. Utilization of CHPI when prescribing herbal treatment

More than 80% of KMDs responded that they "often considered" ($n = 207$, 29.6%) or "always considered" ($n = 384$, 54.9%) CHPI when prescribing herbal treatment. However,

22 (3.1%) KMDs "never considered" and 18 (2.6%) KMDs "almost never considered" CHPI when prescribing herbal treatment (Table 2).

3.3. Top 10 diseases with good responses to herbal treatment prescribed based on CHPI

In response to the question "Which disease was treated most effectively with your CHPI-based herbal treatment prescription?", menopausal disorder was the most frequently reported ($n = 124$, 18.3%), followed by chronic rhinitis ($n = 98$, 14.5%), dyspepsia ($n = 94$, 13.9%), hwa-byung ($n = 92$, 13.6%), diarrhea ($n = 83$, 12.3%), dysmenorrhea ($n = 61$, 9.0%), headache ($n = 59$, 8.7%), inflammation of the digestive tract ($n = 58$, 8.6%), coldness in the hands and feet ($n = 58$, 8.6%), and atopic dermatitis ($n = 55$, 8.1%; Table 3). In addition to these diseases, respondents reported stroke ($n = 5$, 21.7%), oral disease ($n = 4$, 17.4%), and infertility ($n = 3$, 13.0%) in the open-ended responses option (Table 3 and S1).

In terms of the most frequent duration of herbal treatment, respondents indicated 11–20 days for menopausal disorder, chronic rhinitis, dyspepsia, and headache, whereas

Table 2 – Frequency of using CHPI when prescribing herbal treatment

Item	Never	Almost never	Sometimes	Often	Always	Total
Respondents (n)	22	18	68	207	384	699
Proportion (%)	3.1	2.6	9.7	29.6	54.9	100

Data are presented as n or %.
CHPI, cold and heat pattern identification; Example, Never, "I never consider CHPI."

Table 3 – Top 10 diseases for which herbal treatment prescribed on the basis of CHPI is effective, and prescription duration (in days)

Disease/symptoms	Respondents n (%)	Prescribed duration (d), n (%)			
		Cold pattern		Heat pattern	
Menopausal disorder	124 (18.3)	11–20	41 (33.1)	11–20	43 (34.7)
Rhinitis	98 (14.5)	11–20	31 (31.6)	11–20	29 (29.6)
Dyspepsia	94 (13.9)	11–20	33 (35.1)	11–20	34 (36.2)
Hwa-byung	92 (13.6)	21–30	29 (31.5)	11–20	29 (31.5)
Diarrhea	83 (12.3)	< 10	33 (39.8)	< 10	40 (48.2)
Dysmenorrhea	61 (9.0)	21–30	23 (37.7)	21–30	22 (36.1)
Headache	59 (8.7)	11–20	25 (42.4)	11–20	27 (45.8)
Inflammation in the digestive tract	58 (8.6)	21–30	20 (34.5)	21–30	19 (32.8)
Coldness in hands and feet	58 (8.6)	21–30	19 (32.8)	11–20	16 (27.6)
Atopic dermatitis	55 (8.1)	> 61	18 (32.7)	> 61	20 (36.4)

CHPI, cold and heat pattern identification.

they reported 21–30 days for dysmenorrhea and inflammation of the digestive tract. The duration was < 10 days for diarrhea and > 61 days for atopic dermatitis. The treatment duration varied for coldness in hands and feet and hwa-byung depending on CHPI; both required a duration of 21–30 days for a cold pattern and 11–20 days for a heat pattern (Table 3).

3.4. Most frequently prescribed herbal treatment for each disease

The most frequently prescribed herbal treatments for the diseases are given in the order of CHPI efficacy in Table 4.

4. Discussion

With the progress in science and development of medical equipment, various ways of making diagnoses and prognoses in KM have also been developed.[13] This is clearly different from the traditional approach for diagnosis and prognosis, which is based on the correlation of all four examinations (i.e., comprehensive consideration of data obtained by inspection, listening and smelling, inquiry, and palpation). However, in terms of treatment, most KMDs opt to use treatment based on PI, which can be considered a gift from traditional Asian medicine history and is particularly true for herbal treatment.

In an e-mail survey administered to KMDs in Korea, approximately 90% of participants responded that they used PI when treating patients.[14] In an in-person survey, approximately 70% of KMDs said that they used PI.[1] Additionally, both studies reported that the respondents most frequently used PI for prescribing herbal treatment.[1,14] However, since 2010, doctors of both Western medicine and KM have used the revised Korean Classification of Disease and have, therefore, relied on a common code for diseases in their practices. This indicates that all KMDs use the disease identification developed for Western medicine.[15,16] Consequently, many KMDs tend to make a disease diagnosis that is identifiable in Western medicine and consider a PI-based diagnosis as a KM treatment approach.

There are various types of PI, including visceral, qi-blood, and eight-principle PI. Of those, the eight-principle PI is the most frequently used system by KMDs, and the cold and heat pair is one of its components. Cold and heat has been studied from many angles, including literature reviews, development of survey tools, Sasang typology, and clinical research. However, prospective research, including RCT, has not been actively conducted on PI despite its importance. Thus, we conducted this preliminary study to lay the basis for prospective clinical research on cold and heat, on herbal treatment in particular, with the aim of identifying the disease most often encountered by KMDs at a KM clinic or hospital for which CHPI is useful, the herbal treatments used for treatment, and the typical duration for the herbal treatment.

Of the 699 KMDs who responded to the survey, 591 (84.5%) respondents utilized CHPI (29.6% "often considered"; 54.9% "always considered") when prescribing herbal treatment. This finding was not different from the findings of previous studies on PI. The findings suggest that in most cases, cold and heat are included in the thought processes of KMDs who use PI.

In terms of the top 10 diseases that are effectively treated by herbal treatment prescribed with consideration of a CHPI, menopausal disorder was ranked first by 124 respondents. We believe that this is because menopausal disorder has symptoms that can be clearly classified as a cold or heat pattern, such as hot flushes, hypersensitivity to cold, palpitations, and edema.[17] The top 10 diseases included diseases with characteristics of cold and heat, such as coldness in the hands and feet[18] and hwa-byung (a "fire disease").[19] Other diseases with a clear cold or heat pattern were chronic rhinitis, characterized by clear and turbid rhinorrhea, and atopic dermatitis with blood-heat[20] or dampness-heat.[21]

The duration of the herbal treatment prescription varied widely, from < 10 days to > 60 days. No difference was observed between cold and heat patterns. However, in the cases of hwa-byung and coldness in the hands and feet, the duration was longer for the cold pattern (21–30 days) than for the heat pattern (11–20 days).

Table 4 shows the top five herbal treatments separately for cold and heat patterns in the top 10 diseases. Although responses were skewed toward particular treatments (i.e., Socheongnyongtang is used by 40% of respondents for a cold pattern; Hyeonggae-yeongyotang is used by 28% for a heat pattern) for chronic rhinitis, the most frequently used herbal

Table 4 – Preferred herbal treatments for the top 10 diseases

Disease/symptoms	Frequently used herbal treatments, n (%)			
	Cold pattern		Heat pattern	
Menopausal disorder	Gwibi-tang	14 (11.3)	Soyo-san	32 (25.8)
	Insamyangyeong-tang	11 (8.9)	Ja-eumganghwa-tang	13 (10.5)
	Samul-tang	7 (5.6)	Yanggyuksanhwa-tang	8 (6.5)
	Soyo-san	7 (5.6)	Sosiho-tang	7 (6.5)
	Hyangbujapalmul-tang	6 (4.8)	Sihoueokgan-tang	6 (4.8)
Chronic rhinitis	Socheongnyong-tang	39 (39.8)	Hyeonggaeyeongyo-tang	27 (27.6)
	Bojungikgi-tang	17 (17.3)	Bangpungtongseong-san	17 (17.3)
	Mahwangbujaseshin-tang	6 (6.1)	Galgeun-tang	10 (10.2)
	Gyeji-tang	5 (5.1)	Sosiho-tang	4 (4.1)
	Galgeun-tang	2 (2.0)	Yeongyopaedok-san	4 (4.1)
Dyspepsia	Ijung-tang	18 (19.1)	Banhasasim-tang	10 (10.6)
	Hyangsayangwi-tang	15 (16.0)	Dokhwaljihwang-tang	6 (6.4)
	Yukgunja-tang	7 (7.4)	Bangpungtongseong-san	5 (5.3)
	Samchulgeonbi-tang	5 (5.3)	Sosiho-tang	4 (4.3)
	Ojeok-san	5 (5.3)	Hwangnyeonhaedok-tang	4 (4.3)
Hwa-byung	Gwibi-tang	19 (20.7)	Soyo-san	18 (19.6)
	Gamiondam-tang	13 (14.1)	Yanggyuksanhwa-tang	8 (8.7)
	Hyangbujapalmul-tang	6 (6.5)	Sihoueokgan-tang	5 (5.4)
	Ojeok-san	3 (3.3)	Bunsimgi-eum	5 (5.4)
	Yugul-tang	3 (3.3)	Cheongsimyeonja-tang	5 (5.4)
Diarrhea	Ijung-tang	24 (28.9)	Hwangnyeonhaedok-tang	11 (13.3)
	Gwakhyangjeonggi-san	9 (10.8)	Baekho-tang	6 (7.2)
	Gwangyebujaijung-tang	5 (6.0)	Hyeongbangdojeok-san	4 (4.8)
	Wiryeong-tang	4 (4.8)	Galgeun-tang	3 (3.6)
	Samlyeongbaekchul-san	3 (3.6)	Hyeongbangjiwhang-tang	3 (3.6)
Dysmenorrhea	Onkyung-tang	17 (27.9)	Soyo-san	11 (18.0)
	Jogyeongjongog-tang	8 (13.1)	Samul-tang	4 (6.6)
	Geijibokryung-hwan	7 (11.5)	Gwichulpajing-tang	3 (4.9)
	Ojeok-san	4 (6.6)	Bangpungtongseong-san	3 (4.9)
	Danggwijagyak-san	3 (4.9)	Jogyeongjongog-tang	3 (4.9)
Headache	Banhabaekchulcheonma-tang	11 (18.6)	Cheongsangbangpung-tang	6 (10.2)
	Osuyu-tang	9 (15.3)	Cheongsanggyeontong-tang	4 (6.8)
	Bojungikgi-tang	5 (8.5)	Hwangnyeonhaedok-tang	4 (6.8)
	Galgeun-tang	4 (6.8)	Samhwangsasim-tang	3 (5.1)
	Ojeok-san	3 (5.1)	Yanggyuksanhwa-tang	3 (5.1)
Digestive tract inflammation	Ijung-tang	12 (20.7)	Banhasasim-tang	7 (12.1)
	Banhasasim-tang	5 (8.6)	Yanggyuksanhwa-tang	5 (8.6)
	Bojungikgi-tang	4 (6.9)	Yugul-tang	5 (8.6)
	Hyangsayangwi-tang	4 (6.9)	Sosiho-tang	2 (3.4)
	Yukgunja-tang	3 (5.2)	Sohamhyoong-tang	2 (3.4)
Coldness in hands & feet	Danggwisayeokgaohsuyusaenggang-tang	10 (17.2)	Soyo-san	6 (10.3)
	Gwangyebujaijung-tang	5 (8.6)	Yanggyeok-san	4 (6.9)
	Sibjeondaebo-tang	5 (8.6)	Bangpungtongseong-san	3 (5.2)
	Ijung-tang	4 (6.9)	Sosiho-tang	3 (5.2)
	Palmijihwang-hwan	4 (6.9)	Sayeok-san	2 (3.4)
Atopic dermatitis	Bojungikgi-tang	11 (20.0)	Hwangnyeonhaedok-tang	10 (18.2)
	Sogeonjung-tang	3 (5.5)	Bangpungtongseong-san	5 (9.1)
	Mahwangbujaseshin-tang	2 (3.6)	Baekho-tang	4 (7.3)
	Samul-tang	2 (3.6)	Sopung-san	3 (5.5)
	Palmul-tang	2 (3.6)	Yanggyuksanhwa-tang	3 (5.5)

This table shows the herbal treatments preferentially used for the top 10 diseases. Preferred decoctions for each disease are recorded in the order 1–5.

treatments were used by only as few as 10% of KMDs in most diseases. This finding suggests that different doctors tend to use different herbal treatments. In addition, some herbal treatments, such as So-yosan, appear to be used to treat both cold and heat patterns. We believe that this is because doctors use these herbal preparations to treat a complex cold–heat complex or to add, remove, decrease, or increase herbal mate-

rials used for a cold or a heat pattern rather than viewing the preparations as having the characteristics of cold or heat.

However, the study has the following limitations. First, the response rate was relatively low despite the fact that we sent reminder e-mails twice in order to increase the response rate. The response rate was particularly low amongst responders aged > 60 years, who may not be proficient at using the internet. Moreover, a selection bias is likely to exist due to the

once-off e-mail survey as those doctors interested in CHPI were more likely to respond to the survey. Second, a bias is likely to be present as we provided a list of diseases and herbal treatments (although we did refer the government data and considered these extensively prior to creating the lists). In addition, some major diseases treated in KM hospitals were excluded from the list as this was a preliminary study for CHPI clinical research, which may have created a bias; however, this bias may be reduced by referring to the open-ended responses, shown in Table S1.

Third, as we selected the diseases for which patients in Korea most often visit the KM clinic or hospital for treatment and included the herbal treatments that are most frequently used for these, our results cannot be generalized to other countries, including China, where traditional Asian medicine is practiced. Fourth, we did not consider superficial–deep, yin–yang, and weak–strong pairs of principles, which are used to further classify cold and heat patterns.

In this study, we examined KMDs' perception of diseases for which CHPI-based herbal treatments are prescribed and are considered effective. Many KMDs still consider that prospective clinical research, including RCTs, will not reveal the efficacy of KM. For example, the current study ranked menopausal disorder as the main disease for which CHPI-based herbal treatment is effective; however, a previous study that investigated the effect of Geijibokryunghwan on menopausal hot flushes found that its effect was not significantly different from that of placebo.[22] Ultimately, such disparity between the perception of KMDs and research findings can only be overcome through active clinical studies that reflect PI treatment in real clinical settings. We hope that the results of this study can be used as the basis for future studies that can shed light on the effect of PI treatment on disease.

Conflicts of interest

All authors have no conflicts of interest to declare.

Acknowledgments

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.imr.2016.10.004.

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