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Original Article

Biopsychological and pathophysiological features of Cold–Heat subgroup of Sasang typology with Sasang Digestive Function Inventory, Sasang Personality Questionnaire and Body Mass Index

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ABSTRACT

Background: The Sasang typology is a traditional Korean personalized medicine and its Cold–Heat subgroup identification is essential for effective use of medical herbs and acupuncture. The purpose of this study was to discover differences between Cold–Heat subgroups with objective clinical measures and to examine its clinical usefulness.

Methods: The pathophysiological symptoms of the digestive system, temperament and body shape of 241 patients were measured using the Sasang Digestive Function Inventory (SDFI), Sasang Personality Questionnaire (SPQ) and Body Mass Index (BMI). The differences between Cold and Heat subgroups of each Sasang type were tested by Analysis of Covariance considering age and sex, while the associations of SDFI, SPQ and BMI with Cold–Heat subgroup were examined by logistic regression analysis.

Results: There were significant differences between Cold and Heat subgroups in SDFI, SPQ and BMI for the So–Yang, SDFI and BMI for the Tae–Eum type and SDFI–Digestion subscale for the So–Eum type. Moreover, the SDFI–Digestion was a substantial predictor for Cold–Heat subgroup identification in three Sasang types. The logistic regression model with SDFI, SPQ and BMI correctly predicted 81.9%, 77% and 75.5% of the Cold–Heat subgroups in So–Yang, Tae–Eum and So–Eum types, respectively.

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Conclusion: The results of the present study showed that the objective and validated clinical measures of SDFI, SPQ and BMI would be useful for differentiating Cold-Heat subgroups of Sasang typology. Further clinical studies on pathophysiological mechanisms in Cold-Heat subgroup are required to generalize these results.

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1. Introduction

Personalized medicine or optimized treatment and prevention of a person's disease has long been a major interest of medicine since the Hippocrates and Galen of the West and Yellow Emperor and Ayurveda of the East.^{1,2} The Human Genome Project of the present is the modern Western approach to providing safe and effective treatment considering individual susceptibility to disease and treatment based on personal genomic profiles.³

The Sasang typology of Korea is a personalized medicine scrutinized in the book *Longevity and Life Preservation in Eastern Medicine* (1894, 1900) of Jema Lee (1837–1900)^{1,4} that has been used with proven safety and effectiveness for hundreds of years.^{5–9} The Sasang typology divides people into four groups, Tae-Yang, So-Yang, Tae-Eum and So-Eum types based on pathophysiological symptoms, biopsychological traits, previous history and clinical responses to treatment, and provide type- and subgroup-specific acupuncture and medical herbs (Table 1).^{1,2,10–15}

Since the accuracy of differential diagnosis or pattern identification of Sasang type is the first step for the clinical practice of Sasang typology, studies with objective clinical measures and related biological mechanisms have been reported to improve the validity of the clinical procedures. Moreover, there have been studies conducted to investigate the pathophysiological symptoms,^{10,12,16,17} psychological traits,^{2,18,19} physical characteristics,^{2,11,17} and genetic characteristics^{20,21} of each Sasang type, and Autonomic Reactivity,^{11,12} Behavior Activation and Inhibition System,^{22–24} Extraversion¹⁹ and Yin-Yang temperament²² were suggested as its biological mechanisms.

The Sasang type-specific pathophysiological symptoms¹² of perspiration, sleep, digestive function, urination, and defecation along with biopsychological traits^{2,11} are pivotal factors to understand and practice Sasang typology in clinic. The Sasang Digestive Function Inventory (SDFI), which was developed to analyze type-specific typical digestive function-related symptoms from pathophysiological perspectives, showed that individuals of Tae-Eum type have significant higher SDFI score than those of So-Eum type.¹⁶ The Sasang Personality Questionnaire (SPQ), which measures the psychological traits of Sasang typology, has been reported to increase in the order of So-Eum, Tae-Eum and So-Yang types.^{2,18} The Body Mass Index (BMI) and Ponderal Index (PI) have also been reported to be useful for clinical diagnosis, with individuals of Tae-Eum type having significantly higher BMI and PI than those of the So-Eum type.^{2,11,17}

However, these previous studies have only focused on the clinical features of four Sasang types, and have not provided

insights into the Cold-Heat subgroup of Sasang typology, which is pivotal for the detailed and carefully guided clinical interventions to treat medical problems.^{4,25,26} The Cold-Heat subgroup of Sasang typology (Table 1) refers to intrinsic and innate pathophysiological predispositions, even with identical clinical symptoms,^{4,12,17} when compared to the Cold-Heat pattern of conventional traditional East-Asian medicine focusing on the current and momentary clinical manifestations in prognosis.

Although there have been quite a few studies of Cold-Heat subgroups of Sasang typology, their results have critical limitations to be generalized. One study examined the pathophysiological features of Cold-Heat subgroups with arbitrary measures lacking quantification and validation.^{27,28} Another study examined the temperament of subgroups using only the So-Yang type groups,²⁵ and body shape with two Sasang type groups of Tae-Eum and So-Eum.²⁹

The present study examined the pathophysiological and biopsychological features of Cold-Heat subgroup in Sasang typology using clinically validated SDFI, SPQ and BMI values of 241 patients. We collected clinical data from university hospital patients which has high integrity for their Sasang type and Cold-Heat subgroup diagnosis, and attempted to reveal objective clinical differences for Cold-Heat subgroup differentiation of Sasang typology. We emphasized the difference between Cold and Heat subgroups rather than the analysis of each Sasang type in this study.

The multi-dimensional analysis of biopsychological and pathophysiological features with objective clinical measures would provide clinical understandings regarding the underlying mechanisms of Cold-Heat subgroups and the differentiation required in personalized and optimized herbal and acupuncture prescriptions.

2. Methods and procedures

2.1. Subjects and procedures

We retrospectively collected clinical data describing 265 patients who visited Korean Medicine hospital from April 1 to October 19, 2015. Patients who did not complete all required measures ($n=9$) or for whom there were discrepancies in diagnosis between two (J.L. and N.-Y. B.) clinical specialists ($n=15$) were excluded from this study. Tae-Yang type subjects were also excluded because the sample size was too small. This study was approved by the Institutional Review Board (PNUKH-IRB-E2015004).

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