

## Changes in symptom patterns and health-related quality of life of cancer patients before and after chemotherapy

Chung Hsueh-Wen, Chien Li-Yin, Huang Sheng-Miauh, Tai Chen-Jeng, Tai Chen-Jei

**Chung Hsueh-Wen**, Department of Nursing, National Yang-Ming University, Taipei 11221, Taiwan China

**Chien Li-Yin**, Institute of Community Health Care, National Yang-Ming University, Taipei 11221, Taiwan China

**Huang Sheng-Miauh**, Department of Nursing, Mackay Medical College, New Taipei City 25245, Taiwan China

**Tai Chen-Jeng**, Division of Hematology and Oncology, Department of Internal Medicine, Taipei Medical University Hospital, Taipei 11031, Taiwan China; Department of Internal Medicine, School of Medicine, College of Medicine, Taipei Medical University, Taipei 11031, Taiwan China

**Tai Chen-Jei**, Department of Traditional Chinese Medicine, Taipei Medical University Hospital, Taipei 11031, Taiwan China; Department of OB/GYN, School of Medicine, College of Medicine, Taipei Medical University, Taipei 11031, Taiwan China

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**Correspondence to:** **Chen-Jei Tai**, Department of Traditional Chinese Medicine, Taipei Medical University Hospital, Taipei 11031, Taiwan China; Department of OB/GYN, School of Medicine, College of Medicine, Taipei Medical University, Taipei 11031, Taiwan China. [chenjantai@tmu.edu.tw](mailto:chenjantai@tmu.edu.tw)

**Telephone:** +886-2-27372181-3102

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### Abstract

**OBJECTIVE:** Symptom patterns are an important diagnostic concept in terms of Traditional Chinese Medicine. Although symptom patterns and health

related quality of life (HRQOL) are common diagnostic measures for cancer patients, the association between them has not been studied. This study aimed to describe the changes in the pattern of symptoms of *Yang*-deficiency, *Yin*-deficiency, blood stasis, and HRQOL before and after chemotherapy, and to examine the association between the patterns and the cancer patients' HRQOL.

**METHODS:** A panel study was undertaken with 123 cancer patients who were about to begin their first course of chemotherapy at four teaching hospitals in Taiwan. A structured questionnaire was used before and after chemotherapy. HRQOL was assessed using the Medical Outcomes Survey Short-Form 36. The Traditional Chinese Medical Constitutional Scale was used to measure *Yang*-deficiency, *Yin*-deficiency, and blood stasis patterns, with higher scores indicating a larger deficiency.

**RESULTS:** The patients had significantly worse scores for *Yang*-deficient pattern, *Yin*-deficiency pattern, blood stasis pattern, and the physical components of HRQOL after chemotherapy compared with before chemotherapy. The HRQOL scores correlated significantly with *Yang*-deficiency, *Yin*-deficiency, and the blood stasis pattern scores. A generalized estimating equation model showed that the HRQOL scores were significantly worse after chemotherapy compared with before chemotherapy for the physical component, but not for the mental component. Blood stasis pattern was significantly associated with a decreased HRQOL in both the physical and mental components. A hemoglobin level < 12 g/dL was associated with a worse physical component of HRQOL.

**CONCLUSION:** The *Yang*-deficiency, *Yin*-deficiency,

and blood stasis patterns were all associated with lower HRQOL in cancer patients after chemotherapy.

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**Key words:** Quality of life; Symptom pattern; Drug therapy; Neoplasms; Medicine, Chinese traditional

## INTRODUCTION

A symptom pattern is defined, in terms of Traditional Chinese Medicine (TCM), as a group of symptoms due to a medical condition, whereby the condition is diagnosed and treated.<sup>1,2</sup> It is believed that TCM symptom patterns reflect meaningful differences in patients with the same disease,<sup>3</sup> and the symptom patterns may change dynamically during the course of a disease.<sup>3,4</sup> Researchers have reported that blood-stasis pattern and deficiency patterns are common in patients with cancer.<sup>1,5</sup> Blood-stasis pattern refers to a group of symptoms that are typically related to stasis or retention in the blood and deficiency pattern refers to a group of symptoms that are closely associated with deficiency in energy (*Qi*) and body fluid.<sup>6,7</sup> According to TCM theory, *Qi*, blood, and body fluid are the basic elements which maintain the body's normal function.<sup>8</sup> Both blood stasis and deficiency patterns can be used to determine an imbalance and abnormal function of the viscera in the human body.<sup>6,7</sup>

Deficiency patterns can further be classified into *Yang*-deficiency and *Yin*-deficiency. The former refers to insufficiency in energy; the latter refers to insufficiency in blood and interstitial fluids.<sup>9,10</sup> Blood stasis deficiency pattern refers to the obstruction of blood and *Qi* in the lesion site.<sup>6,7</sup> Deficiency pattern and blood stasis pattern have been used to characterize medical conditions, and commonly, the condition of patients with cancer.<sup>6,8</sup>

Studies have reported that chemotherapy is associated with worse physical and mental quality of life for cancer patients.<sup>11-13</sup> Many cancer patients receiving chemotherapy also use TCM in Taiwan.<sup>14</sup> Treatment with TCM can effectively manage chemotherapy-related complications.<sup>15</sup> Although health-related quality of life (HRQOL) is a vital indicator in evaluating medical treatment, few studies have examined the association between TCM symptom patterns and the HRQOL of cancer patients. In addition, no study has followed these two health outcomes for cancer patients after they have received chemotherapy.

The objective of this study was to describe the changes in the patterns of *Yang*-deficiency, *Yin*-deficiency, blood stasis, and HRQOL in cancer patients before and after their first course of chemotherapy, and to examine the association between the TCM symptom patterns and HRQOL.

## MATERIALS AND METHODS

A panel study was used which included patients with lung, liver, colorectal, and breast cancer who were about to begin their first course of chemotherapy and agreed to participate in the study at four hospitals in northern Taiwan. A total of 149 eligible patients were invited and 123 (82.6%) agreed to participate. Patients were interviewed 3 days before chemotherapy and two weeks after the start of chemotherapy. Data was collected from January 2009 to March 2011. The study was approved by an institutional review board at the Taipei Medical University Hospital (TMUH-05-08-10).

### Measurements

The study variables included patient characteristics (age, gender, marital status, education level, employment status, and religion), clinical characteristics (cancer diagnosis, cancer metastasis, and biochemical examination including: white blood cell, red blood cell, hemoglobin, hematocrit, and platelet levels), *Yang*-deficiency, *Yin*-deficiency, and blood stasis patterns, and HRQOL. Patient and clinical characteristics were collected three days before chemotherapy. *Yang*-deficiency, *Yin*-deficiency, and blood stasis pattern, and HRQOL were collected 3 days before and 2 weeks after chemotherapy.

The Traditional Chinese Medical Constitutional Scale (TCMCS) was used to measure symptom patterns.<sup>9,10</sup> The TCMCS included 44 items covering three symptom pattern classifications: *Yang*-deficiency (19 items), *Yin*-deficiency (19 items), and blood stasis (17 items). Each item was rated on a 5-point Likert scale, ranging from 0 to 4. Higher scores indicated a larger deficiency. The Cronbach's  $\alpha$  values were 0.83, 0.80, and 0.78 for *Yang*-deficiency, *Yin*-deficiency, and blood stasis patterns, respectively.

HRQOL was measured by the Medical Outcomes Survey Short-Form 36 (SF-36).<sup>16,17</sup> The SF-36 instrument composed 36 items covering eight domains: physical functioning, role limitations from physical health problems, role limitations from emotional problems, body pain, energy/fatigue, general health perceptions, social functioning, and emotional well-being. Summary physical component scores (PCS) measured the physical aspects of quality of life, and mental component scores (MCS) measured the mental aspects of quality of life. The standardized scale ranged from 0 to 100. A higher score indicated a better HRQOL. The reliability and validity of the SF-36, Taiwanese version, has been well-established.<sup>17-20</sup>

### Statistical analysis

Statistical analysis was performed using SPSS for Windows Statistics version 19.0 (IBM Corp., Armonk, NY, USA). Descriptive analysis was performed using percentages, means ( $\bar{x}$ ), and standard deviations ( $s$ ). A paired *t*-test was used to examine the changes in the symptom patterns and HRQOL in cancer patients be-

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