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Journal of Ethnopharmacology

journal homepage: www.elsevier.com/locate/jep

Research Paper

Prescription patterns of Chinese herbal products for post-surgery colon cancer patients in Taiwan



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ARTICLE INFO

Article history:

Received 22 January 2014

Received in revised form

3 June 2014

Accepted 4 June 2014

Available online 16 June 2014

Keywords:

Colon cancer

Traditional Chinese medicine (TCM)

Chinese herbal formula (CHF)

Prescription patterns

ABSTRACT

Ethno-pharmacological relevance: Traditional Chinese medicine (TCM) is commonly provided to cancer patients, however, the patterns of prescriptions for this type of medicine in Taiwan are unclear. This study aimed to evaluate the use of traditional Chinese medicine products in colon cancer patients post-surgery in Taiwan and to research patterns of TCM.

Material and Methods: This was a cross-sectional study of newly diagnosed colon cancer patients who received surgery between 2004 and 2008 identified from the National Health Insurance Research Database of Taiwan. The prescription patterns and reasons for the use of TCM for colon cancer were analyzed.

Results: The results showed that “symptoms, signs and ill-defined conditions” (23.3%) and diseases of the digestive system (16.9%) were the most common reasons for using Chinese herbal medicine. Xiang-sha-liu-jun-zi-tang (7.1%), Bu-zhong-yi-qi-tang (4.3%), Jia-wei-xiao-yao-san (4.1%), Shen-Ling-Bai-Zhu-San (3.7%), Ban-Xia-Xie-Xin-Tang (3.4%), Gui-pi-tang (2.4%), Ping-Wei-San (2.4%), Gan-Lu-Yin (2.0%), Bao-He-Wan (1.9%), and Zhen-Ren-Huo-Ming-Yin (1.8%) were the most commonly prescribed single Chinese herbal formulae (CHF) for colon cancer patients post-surgery. *Hedyotis diffusa* Willd (Bai Hua She She Cao) (5.1%) and *Scutellaria barbata* (Ban Zhi Lian) (4.8%) were the most commonly prescribed single Chinese herbs.

Conclusions: This study identified patterns of TCM use in colon cancer patients post-surgery in Taiwan. The herbal ingredients were most commonly used for stimulate ghrelin secretion to increase food intake and had potential anti-tumor effect. However, further research is required to evaluate any beneficial effects which could identify leads for the development of new treatment strategies using TCM.

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1. Introduction

Colorectal cancer is the third most common cancer and the fourth most frequent cause of cancer deaths worldwide (Jemal et al., 2011). In Taiwan, colon cancer is now the most common cancer and has increased markedly with overall incidence increasing from 34.0 cases per 100,000 population in 2002 to 41.4 cases per 100,000 population in 2009 (Taiwan Cancer Registry). Surgical

resection is considered to be the gold standard treatment for localized colon cancer, and post-operative chemotherapy is used to eradicate and decrease the recurrence of micrometastases.

Patients with metastatic colorectal cancer cannot be cured, however, chemotherapy may offer palliation and some prolongation of life (Weeks et al., 2012). New therapies are clearly needed to improve survival and to also reduce side effects. To this end, some researchers have turned to complementary/alternative medicine such as TCM, which is now one of the most popular complementary/alternative medicines provided to patients in many countries (Baak et al., 2011). However, it is still unclear whether TCM combined with Western medicine (Baak et al., 2011;

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Shen et al., 2012; Xu et al., 2012b) has the potential to improve outcomes and prolong the ability to receive chemotherapy, and few studies have reported the use of TCM among colon cancer patients.

In Taiwan, TCM is commonly offered to cancer patients, however, the patterns of prescriptions given for this type of medicine in Taiwan are unclear. The National Health Insurance (NHI) system was established in 1995, and it consists of all medical information from the National Health Insurance Research Database for more than 99% of the population in Taiwan. The NHIRD database provides researchers with a platform to examine and study the utilization of TCM prescription patterns by TCM doctors. This study aimed to evaluate the use of TCM in newly diagnosed colon cancer patients post-surgery in Taiwan, and to research patterns of TCM.

2. Materials and methods

2.1. Data sources

The present cross-sectional study utilized data obtained from the National Health Insurance Research Database (NHIRD) which is the database released annually by the NHI Bureau for research purposes. The NHIRD consists of all medical information from the NHI program including complete data on outpatient visits, hospital admissions, prescriptions, disease status, and demographic data for more than 99% of the population living in Taiwan (Bureau of National Health Insurance, 2014). According to the NHI program guidelines, TCMs are only provided for outpatient care including CHF, acupuncture, and traumatology manipulative therapy. The CHF commonly used are combinations of two or more individual Chinese herbs (Wang et al., 2012), and each of them was covered by the NHI program. The diagnostic codes in the NHIRD are based on the International Classification of Disease, 9th Revision, Clinical Modification (ICD-9-CM).

2.2. Study subjects

Patients were selected with newly diagnosed colon cancer who had undergone surgery for colon cancer between 1 January 2004 and 31 December 2008 ($n=24303$). Due to the fact that the SARS infection in 2003 and economic crisis in 2009 might influence patient willingness to go to hospital for medical care we attempted to establish a period of time that was not biased by these known factors. Therefore, we selected data from the year 2004 to 2008 for the purposes of this review. A diagnosis of colon cancer in this study was considered to be reliable because specialists must supply ICD-9-CM codes with pathological and histological results for Registry for Catastrophic Illness Patient Database verification. Patients who died within two months after operation were excluded from analysis ($n=982$). In the NHI system, the insured who suffer from certain major diseases can apply for a

Catastrophic Illness Certificate (malignancies are included in the category of catastrophic illness). Any patients who have been issued a Catastrophic Illness Certificate can receive co-payment exemption under the NHI program. If hospital administrators do not complete the medical care records of cancer patients, they will not be able to be reimbursed by the NHI system. Such cancer patients often consume a significant amount of financial resources for medical care and as a result, we can safely assume that very little data will be missing from the database.

A date two months post-colon cancer surgery was defined as the index date. We divided the study subjects into two groups: the TCM group, patients who received TCM treatment within one year after the index date, and the non-TCM group, patients without any TCM treatment within one year after the index date (Fig. 1).

2.3. Key variables of interest

The demographic variables of interest were compared between the TCM and non-TCM groups. Age was categorized into six groups: < 30, 30–39, 40–49, 50–59, 60–69, 70–79 and ≥ 80 years. Urbanization was classified into four levels, with 1 indicating the highest level of urbanization and 4 the lowest. Family income was also grouped into five levels (in New Taiwan Dollars, NTD): 0, 1–15840, 15841–28800, 28801–45800, and ≥ 45801 . Geographic area was classified into North, Middle, South, and East. Occupation was classified into public and military, industrial, business, low income, others and retired.

In Taiwan, TCM physicians (those who received series training in Chinese or both Chinese and Western medicine, all must pass the national licensing examinations and to go through residency training programs in hospitals) are requested to make diagnoses based on ICD-9-CM coding (no more than three diagnostic codes for each visit). Each prescription was connected to its diagnosis. Accordingly, we analyzed the number of the corresponding diagnostic codes for subjects with TCM prescriptions.

2.4. Statistical analysis

Distributions of the demographic variables were compared between the TCM and non-TCM groups using the chi-square test. The top ten prescription rates of CHF for treating colon cancer were presented in descriptive statistics. The most frequent diagnoses for the prescriptions of CHF were also displayed by frequency and percentage. All statistical analyses were performed with SAS (version 9.3; SAS Institute, Cary, NC).

3. Results

Twenty-three thousand and three hundred twenty-one patients were identified from the NHIRD who had surgery for colon cancer from 1 January 2004 to 31 December 2008. The

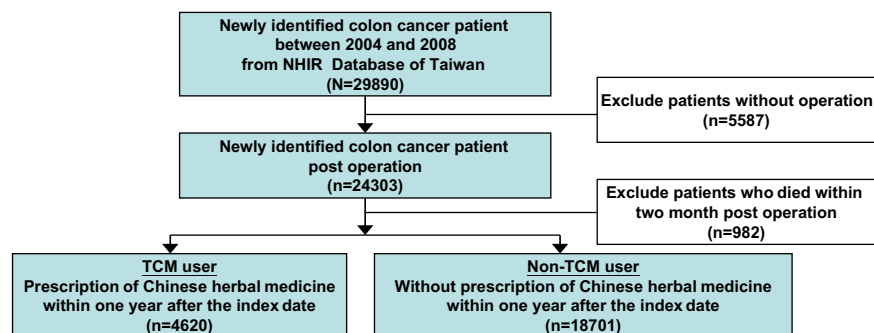


Fig. 1. Flow diagram of study subjects selection from the National Health Insurance Research Database during 2004–2008.

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