

Original Article

Systematic Review of Case Reports about Korean Medicine for Lung Cancer

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Objectives: This systematic review aimed to put the case reports of lung cancer on Korean medicine (KM) together and adopt the results in clinical practice.

Methods: Researches were searched using the PubMed, EMBASE, OASIS, KoreanTK, KISTI, RISS, KISS, and NDSL. The search term were 'lung cancer' and KM. There was no restriction in year.

Results:

1. Among the 48 studies, 68 patients were reported in total. The types of lung cancer were non-small-cell lung cancer (n=41) and small-cell lung cancer (n=6).
2. The number of patients who received KM therapy alone was 40. On the other hand, 25 patients were treated with KM and chemotherapy simultaneously. All case reports used herbal medicine except 2 studies. Other types of treatment were acupuncture, moxibustion, pharmacopuncture, cupping, meditation, etc.
3. Several efficacy evaluation variables were used such as tumor size, changes of symptoms, duration of survival, the quality of life, and so on. The safety was evaluated by checking adverse effects using blood test.
4. Regarding the tumor response, partial response was reported in 12 cases, stable disease was in 22 cases, 50% of the total cases, which is a high level of tumor response. Furthermore, all 11 cases with the evaluation on the length of survival showed prolonged survival than the expectancy of corresponding stage, with the stable quality of life.

Conclusion: We have found that the applicability of KM for treatment of lung cancer through this review. Evidence based medicine can be realized by checking cases and applying them in clinical practice.

Key Words : Lung neoplasm, Medicine, Korean Traditional, Case reports, Systematic Review

Introduction

Lung cancer is the major cause of deaths from cancer worldwide, and one of the common types of cancer.¹⁾ According to the statistics of year 2017 in the United States, lung cancer accounts for 27% and 25% of deaths from cancer in men and women population respectively,²⁾ the recent research in Korea reported

lung cancer is the second most prevalent cancer among men, the fifth among women, and the fourth in total. The five-year survival rate being 26.7% – the lowest among the top ten cancers, it is one of the fatal types of cancer.³⁾

The standard treatment of lung cancer is surgery, radiotherapy, and chemotherapy. The recurrence rate of lung cancer after surgery is relatively high,⁴⁾ and more than 50% of lung cancer patients are found with metastasis at the time of diagnosis. This leads to

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chemotherapy for most lung cancer patients, inducing side effects such as vomiting, diarrhea, loss of appetite, dyspnea, myelosuppression, and renal toxicity, degrading the quality of life.⁵⁾ However, the existing medical system is not sufficiently dealing with these symptoms and lacks intensive management.⁶⁾ On the other hand, there are various approaches to overcome the limitation of existing treatment and to develop new therapeutic approaches in the academic society of Korean medicine, with a number of publications about the effect of them.⁷⁾

The clinical case report is a type of medical writing on symptoms, diagnosis, progress, and treatment of one or several patients, originated from ancient Egypt.⁸⁾ Its value has been controversial for decades,⁹⁾ and is reckoned as the lowest grade in evidence based medicine, the movement arisen in the late 1980s.¹⁰⁾ Despite such controversies, the case report is important as a medical observation on the progress,¹¹⁾ and promotes communication about discovery of new illness, mechanism of disease, therapeutic approach, and side effect and efficacy of drug among physicians. Furthermore, it has a potential of developing into new hypothesis for well-designed studies like randomized clinical trials.^{12),13)} It is also educational, helping readers acquire the new clinical knowledge and apply in clinical practice.¹⁴⁾

Recently, various case reports on lung cancer treated with Korean medicine (KM) or combined Korean and western medicine has been published by KM doctors, but so far there is no review on these studies to help have an insight to apply them in clinical practice. Thus, the author analyzed the case reports related to lung cancer until lately, and studied on the common treatments in use and their effect on prognosis to support clinical practice and to suggest the direction of further study.

Method

1. Selection of study object

We did not limit the period of time of publication, and the language was limited to Korean and English. The databases used for international research were PubMed and EMBASE and the databases for national studies were Oriental Medicine Advanced Searching Integrated System (OASIS, oasis.kiom.re.kr), Korean Traditional Knowledge Portal (KoreanTK, <http://www.koreantk.com>), Korea Institute of Science and Technology Information (KISTI, society.kisti.re.kr), Research Information Sharing Service (RISS, <http://www.riss.kr>), Koreanstudies Information Service System (KISS, kiss.kstudy.com), and National Digital Science Library (NDSL, www.ndsl.kr). The search term used on PubMed was “Lung Neoplasms”[MeSH Terms] AND “Medicine, Korean Traditional”[MeSH Terms] and the one for EMBASE was 'lung tumor'/exp AND ('herbal medicine'/exp OR 'korean medicine'/exp) AND 'case report'/exp. In the national databases, the combination of “lung cancer (폐암)” and “Korean medicine (한의학)” were used.

2. Analysis of selected literature

Participants/Problems (P) included the type and the stage of lung cancer, Intervention (I) included the treatment patients received, and Outcome (O) included which measurement was used to evaluate the effect and also included other characteristics.

Result

1. Search result

In the international database, two results from PubMed and 29 from EMBASE were searched. In Korean database, OASIS had 120 results from searching “lung cancer (폐암)” and 58 results in KoreanTK. As

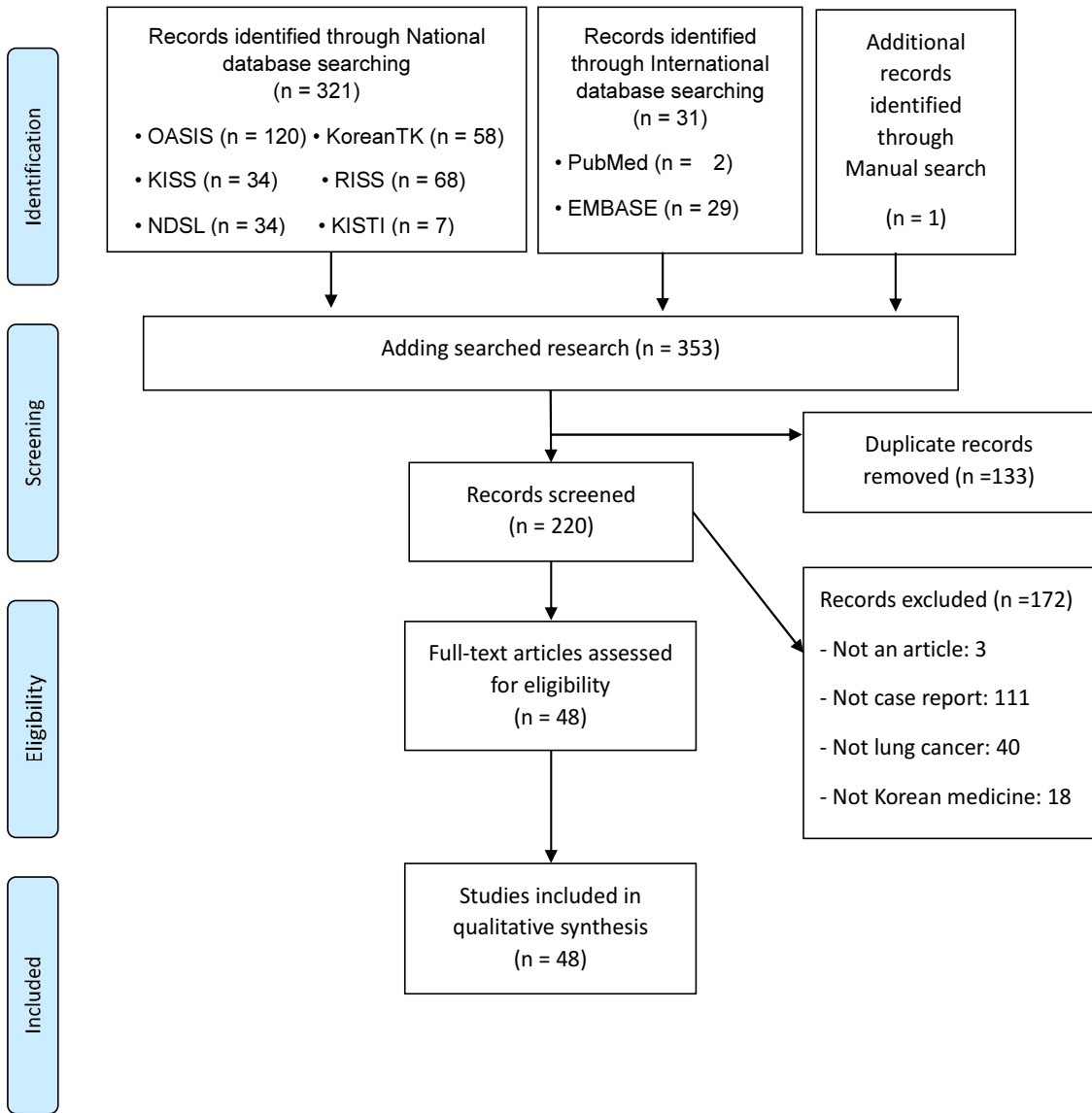


Fig. 1. Flow chart of study selection.

the result of searching “lung cancer (폐암) AND Korean medicine (한의학),” 34 studies were found in KISS, 68 in RISS, 34 in NDSL, and 7 in KISTI. One additional record was identified through manual research. All 353 studies were added together, and 133 duplicate records were removed. 220 studies were screened and

172 were excluded because they were not an article; a case report; about lung cancer; nor about Korean medicine. As an outcome, 48 full-text articles were assessed for eligibility and included in qualitative synthesis. (Figure 1)

2. Literature analysis

1) The number of studies by year

There were 1 study in 1997 and 1999, 2 studies in 2003, 2005, 2007, 2008, 2009 and 3 in 2010, 7 in 2011, 3 in 2012, 1 in 2013, 6 in 2014, 5 in 2015, 2 in 2016, 3 in 2017, and 2 in 2018. From 1997 to this day, case reports on lung cancer has been steadily published, and there were many studies especially in 2011.

2) The number of studies by journal

Seven case reports were published in the international journal such as *Integrative Cancer Therapies*, *Explore*, *Oncology Letters*, and *Case Reports in Oncology*. Regarding domestic journals, 17 studies were published in the *Journal of Korean Traditional Oncology*, 3 studies in the *Journal of pharmacopuncture*, 1 in the *Journal of Korean Medicine*, 11 in the *Journal of Internal Korean Medicine*, 2 in the *Journal of Oriental Chronic Diseases*, 2 in the *Journal of Korean Oriental Oncology*, 2 in the *Journal of physiology and Pathology in Korean Medicine*, and 2 in the *Journal of Sasang Constitutional Medicine*.

3) The subject of studies (the type of lung cancer)

Among the 48 studies, 68 patients were reported in total. Except for 5 cases of cancer metastasized to lung (3 cases of primary hepatocellular cancer, 1 case of primary rectal cancer, 1 case of bladder cancer), other studies were primary lung cancer.

The types of lung cancer were non-small-cell lung cancer (NSCLC, n=41) and small-cell lung cancer (SCLC, n=6), with 8 unknown cases (undescribed in 7 cases and biopsy refused in one case). Among NSCLC studies, squamous cell carcinoma was reported in 12 cases, adenocarcinoma in 22 cases, and unknown in

7 cases; SCLC studies included 2 cases of limited stage, 1 case of extensive stage, and 3 unknown cases.

The number of lung cancer patients with a single metastasis were 33 – the sites were the opposite lung (n=7), brain (n=7), lymph nodes (n=9), bone (n=4), pleura (n=6) and unknown in 2 cases. Multiple metastasis was reported in 7 cases: 1 patient to lymph nodes, bones, and chest wall; 1 patient to the brain and bones; 1 patient to the brain and the opposite lung; 2 patients to lymph nodes and the opposite lung; 1 patient to the lymph nodes, the opposite lung, and the body of pancreas. One patient was diagnosed as Mx, so it was described just as mediastinum and pericardial invasion. (Table 1)

4) The types of treatment

The number of patients who received KM therapy alone was 38. The reasons of taking KM therapy alone are to prevent recurrence/metastasis of tumor or to treat side effect after having finished standard western treatment such as surgery, chemotherapy, and radiotherapy; the refusal of patients to receive standard western treatment; and old age.

On the other hand, 25 patients were treated with KM and chemotherapy simultaneously. The chemotherapy drugs were olmutinib, crizotinib, gefitinib, gemcitabine, cisplatin, pemetrexed, erlotinib, bevacizumab, afatinib, paclitaxel, and carboplatin, most of which were target agents. There were 3 cases with the type of chemotherapy undescribed in the paper. One patient received both chemotherapy and radiotherapy. The western medication used to subside symptoms were narcotic analgesics (oxycodone, fentanyl patch, and codein), antibiotics, steroids (dexamethasone), diuretics (mannitol), mucolytics (erdosteine) and the medication for urinary incontinence (propiverine), for bronchitis (morniflumate), and for psychosis (quetiapine). Other medications were

antidiabetics and antihypertension drugs for underlying diseases, and vitamins B and C for anticancer purpose.

Analyzing the types of KM treatment, all case reports used herbal medicine except 2 studies. The most frequently used was the allergen-removed *Rhus verniciflua* Stokes (aRVS, n=13), followed by HangAmDan (HAD, n=5), HamgAm-Plus (HAP, n=5), Soram-Dan (n=2), Samchilchoongcho-jung (n=2), and other prescriptions to improve certain symptom – bojung-ikki-tang, maekmundong-tang, gumsuyukunjun, and so forth. Acupuncture was used in 17 studies, and the mostly used acupuncture points were LI4, LR3, ST36, BL13, and BL17; lung-tonifying acupuncture

of Sa-am acupuncture was used in 2 cases; electroacupuncture (EA) was used in 2 cases. Moxibustion was used in 10 studies on *su points* such as CV12, CV4, CV8, BL13, and BL14. Pharmacopuncture was used in 10 studies which was either intravenous or on acupoints, and the types of herbal medicine included cultivated wild ginseng, *Cordyceps militaris*, *Trichosanthes kirilowii*, *Carthamus tinctorius*, *prumella vulgaris*, human placenta, and sweet bee venom. Other types of treatment were cupping, meditation, light therapy, aromatherpy, sitz bath, exercise treatment, herbal hot pack, and foot bath herbal massage. Details of each treatment are in the Table 1. (Table 1)

Table 1. The Characteristics of Patients and Interventions in the Included Studies.

Study	Patients	Intervention
Park, ⁴⁵⁾	1 case of NSCLC patient (SCC, T4N2M0, StageIIIb)	1. Herbal medicine (no description) 2. Pharmacopuncture (clutivated wild ginseng) 3. Acupuncture (no description for acupoint)
Lee, ⁴⁸⁾	1 case of LC patient with brain metastasis	1. Herbal medicine (Seonghyangjeonggi-san with Oryung-san, Younggyechulgam-tang) 2. Acupuncture (acupoint for stroke)
Cha, ⁴⁷⁾	1 case of NSCLC patient (SCC, stage IIIa)	1. Herbal medicine (Gilgyung-tang) 2. Light therapy 3. Pharmacopuncture (<i>Carthamus tinctorius</i> L., <i>Houttuynia cordata</i> Thunberg) 4. Acupuncture (no description for acupoint) 5. Moxibustion
Park, ⁴⁸⁾	1 case of LC patient with metastatic LN (R/O stage III)	1. Herbal medicine (Gunchilgyebok-Jung/ Gamiyangwe-tang, Bangpoongtongsung-san) 2. Acupuncture (LI4, LR3, CV12, ST25)
Choi, ⁴⁹⁾	1 case of NSCLC patient (adenocarcinoma, Stage IV, EGFR (+))	1. Herbal medicine (Nobongsangki-Jeong: Loranthus parasticus Merrill, Vespaee Nidus) 2. Acupuncture (Ashi point)
Lee, ⁵⁰⁾	1 case of NSCLC patient with brain metastasis (T2N1M1)	1. Herbal medicine (Banhabaekchulchenma-tang with <i>Rhus Verniciflua</i> Stokes)
Park, ⁵¹⁾	1 case of NSCLC patient me metastasized to multiple LNs, bone, and chest wall (adenocarcinoma, stage IV)	1. Herbal medicine (Yieumjeongajibang/ Gongjin-dan, Bojungyikki-tang, Yijin-tang, Heangso-san) 2. Acupuncture (LI4, LR3, ST 36, trigger point at neck)
Ha, ⁵²⁾	1 case of NSCLC patient (adenocarcinoma, stage IV)	1. Herbal medicine (Samchilchoongcho-Jung: Panax notoginsentg Radix, Cordyceps militaris, Panax ginseng C.A., Meyer, Boswellia carterii BIRDWOOD)
Park, ⁵³⁾	1 case of NSCLC patient (SCC, stage IIIa)	1. Pharmacopuncture (Pulsatilla koreana Nakai, Gingseng Radicella, Glycyrrhiza uralensis Fischer)
Park, ⁵⁴⁾	1 case of NSCLC patient with bone and brain metastasis	1. Herbal medicine (Samul-tanggagambang with <i>Rhus Verniciflua</i> Stokes)

Study	Patients	Intervention
Bang, ⁵⁵⁾	2 case of NSCLC patient (stage IIIb T2N3 adenocarcinoma; stage IIIa T1N2)	1. Pharmacopuncture (Cultivated wild ginseng) 2. Herbal medicine (Hangam-dan)
Kim, ⁵⁶⁾	1 case of NSCLC patient (stage IIb T2bN1, SCC)	1. Pharmacopuncture (Cultivated wild ginseng) 2. Acupuncture (LI4, LR3, ST36, CV12, ST25) 3. Cupping 4. Moxibustion (CV12, BL26)
Park, ⁵⁷⁾	1 case of SCLC patient with brain metastasis	1. Herbal medicine (Soeumin Palmulgunja-tang, Jayoon-tang, Soeumin Jihwangbaekho-tang, Soyangin Dojukganggi-tang, Soyangin Yangkuksanghwa-tang)
Choi, ⁵⁸⁾	1 case of SCLC patient	1. Herbal medicine 1) Hangam-dan: Coicis Semen, Panax notoginseng Radix, Hippocampus Kelloggii, Cordyceps Militaris, Santsigu Tuber, Ginseng Radix, Bovis Calculus, Margarita, and Moschus 2) PSM (Polysaccharide of mushrooms): Ganodema Lucidum, Hericium erinaceus, Coriolus versicolor, Grifola frondosa, Lentinus edodes, Cordyceps militaris, Polyporus umbellatus, Pleurotus ostreatus
Hong, ⁵⁹⁾	1 case of SCLC patient (T3N3M0)	1. ElectroAcupuncture (EX-B2 at T5~T7) 2. Herbal medicine (Samchulgunbi-tang, Bojungyikki-tang) 3. Acupuncture (Ex-HN3, LU3, LU5, L14, ST36, LR3) 4. Interferential current therapy (Right flank)
Kim, ⁶⁰⁾	1 case of NSCLC patient (adenocarcinoma, T4N1M1)	1. Moxibustion (BL13, BL17, BL42, BL43) 2. Herbal medicine 1) Anti-cancer effect: <i>Rhus Verniciflua Stokes</i> 2) Symptom improvement: Guibi-tang, Shipjeondaebotang, yangsayukgunja-tang 3. Acupuncture (no description for acupoint)
Song, ⁶¹⁾	1 case of NSCLC patient with bone metastasis (SCC, stage IV)	1. Herbal medicine (<i>Rhus Verniciflua Stokes</i>)
Kwon, ⁶²⁾	2 cases of NSCLC patients (stage IV, T4N2M1; stage IIIb, T4N3M0, adenocarcinoma)	1. Herbal medicine 1) Anti-cancer effect: <i>Rhus Verniciflua Stokes</i> 2) Symptom improvement: Haengsochunggi-tang, Bojungyikki-tang, Gagamwiryung-tang
Yu, ⁶³⁾	1 case of NSCLC patient (stage IV)	1. Herbal medicine 1) Anti-cancer effect: <i>Rhus Verniciflua Stokes</i> 2) Symptom improvement: unknown Herbal medicine
Choi, ⁶⁴⁾	1 case of NSCLC patient (adenocarcinoma)	1. Herbal medicine 1) Anti-cancer effect: <i>Rhus Verniciflua Stokes</i> 2) Symptom improvement: Bojungyikki-tang, Boikyungwi-tang, Banhabaekchulcheonma-tang, Gyuntongdadam-tang
Park, ⁶⁵⁾	1 case of NSCLC patient (adenocarcinoma, T2N0M1a, stage IV)	1. Herbal medicine 1) <i>Rhus Verniciflua Stokes</i> 2) Bojungyikki-tang, Geumsuyukgunjeon, Sojadodamganggi-tang
Kim, ⁶⁶⁾	1 case of NSCLC patient (SCC, stage IV)	1. Herbal medicine (<i>Rhus Verniciflua Stokes</i>)
Kang, ⁶⁷⁾	1 case of SCLC patient & 1 case of HCC patient with lung metastasis	1. Herbal medicine 1) Hangam-dan: Coicis Semen, Panax notoginseng Radix, Hippocampus Kelloggii, Cordyceps Militaris, Santsigu Tuber, Ginseng Radix, Bovis Calculus, Margarita, and Moschus 2) PSM (Polysaccharide of mushrooms): Ganodema Lucidum, Hericium erinaceus, Coriolus versicolor, Grifola frondosa, Lentinus edodes, Cordyceps militaris, Polyporus umbellatus, Pleurotus ostreatus 3) Mackmundong-tang, Guibi-tang, Gilgyung-tang 2. Acupuncture (no description for acupoint) 3. Moxibustion (no description for acupoint)

Study	Patients	Intervention
Park, ⁶⁸⁾	1 case of NSCLC patient with brain metastasis (RUL, stage IV)	<ol style="list-style-type: none"> Herbal medicine <ol style="list-style-type: none"> Hangam-dan: Coicis Semen, Panax notoginseng Radix, Hippocampus Kelloggii, Cordyceps Militaris, Santsigu Tuber, Ginseng Radix, Bovis Calculus, Margarita, and Moschus PSM (Polysaccharide of mushrooms): Ganodema Lucidum, Hericium erinaceus, Coriolus versicolor, Grifola frondosa, Lentinus edodes, Cordyceps militaris, Polyporus umbellatus, Pleurotus ostreatus Chunggan extract (CGX): Artemisia capillaris Herba, TrionycisCarapax, Raphani Semen, Atractylodis Macrocephalae Rhizoma, Poria, Alismatis Rhizoma, Atractylodis Rhizoma, Salviae Miltiorrhizae Radix, Polyporus, Amomi Fructus, Aurantii Fructus, Glycyrrhizae Radix or Helenii Radix Acupuncture (CV-6, CV-15, LR-14, GV-20, LU-11, HT-7, LU-10, GB-24, LU-1, LU-9, LR-3, LU-6 and BL-63) Moxibustion (CV-4, HT-8, and KT-1.)
Kim, ²⁷⁾ 2015	1 case of NSCLC patient with LN metastasis (SCC, stage IIIb)	<ol style="list-style-type: none"> Herbal medicine (Saengmaecksan with baekhapgogeum-tang) Acupuncture (BL13, BL43, BL23, CV22, LU1, LI4, ST40, LR3, SP3) Moxibustion (BL26) Cupping (Su points) Interferential current therapy (Shoulder and back) Sitz bath
Kim, ⁶⁹⁾	1 case of NSCLC (adenocarcinoma, stage IV)	<ol style="list-style-type: none"> Herbal medicine (<i>Rhus Verniciflua Stokes</i>) Acupuncture (no description for acupoint)
Park, ⁷⁰⁾	1 case of SCLC patient (limited stage)	<ol style="list-style-type: none"> Herbal medicine (Samchilchoongcho-Jung: Panax notoginseng Radix, Cordyceps militaris, Panax ginseng C.A., Meyer, Boswellia carterii BIRDWOOD)
Zheng, ⁷¹⁾	3 cases of NSCLC patients (adenocarcinoma, stage IIIb, IV)	<ol style="list-style-type: none"> Herbal medicine (Atractylodes macrocephala Koidzumi, Houத்துynia Herba, Zingiber officinale, Farfarae Flos, Stemonae Radix, Areca catechu L Pueraria lobata Ohwi, Prunus armeniaca var. ansu Maxim, Fritillaria verticillata var. thunbergii BAK.)
Choi, ⁷²⁾	1 case of LC	<ol style="list-style-type: none"> Herbal medicine (Hang-Am Plus: Coix lachryma-jobi seed, Panax notoginseng root, Hippocampus kelloggi, Cordyceps militaris, Cremastra appendiculata tuber, Panax ginseng root, Bos taurus calculus, Pteria martensii, and Moschus moschiferus)
Park, ⁷³⁾	1 case of NSCLC patient (adenocarcinoma, stage IIIb, T2aN0M1a)	<ol style="list-style-type: none"> Herbal medicine (Hang-Am plus, Samul-tanggagam) Acupuncture (LI4, LI10, LI11, LR3), Electoracupuncture Moxibustion (ST25, CV4, CV8, CV12 PC8, KI1) Herbal hot pack (ST25, CV4, CV8, CV12) Foot bath Herbal-massage
Gu, ⁷⁴⁾	1 case of LC patient with brain metastasis (T2N3M1a)	<ol style="list-style-type: none"> Acupuncture (LU9, SP3, HT8, LU10) Herbal medicine (Cheongpebyeolgap-san, Ssangpae-tang, Yangwijinsik-tang, Shigyunghwadamjeon) Meditation Moxibustion (CV12, CV4) Cupping (Su points) Pharmacopuncture (Carthamus tinctorius L, Hominis Placenta, Sweet bee venom)
Choi, ⁷⁵⁾	1 case of SCLC patient (T3M2M0)	<ol style="list-style-type: none"> Herbal medicine (Hangam-dan: Coicis Semen, Panax notoginseng Radix, Hippocampus Kelloggii, Cordyceps Militaris, Santsigu Tuber, Ginseng Radix, Bovis Calculus, Margarita, and Moschus)
Yoo, ⁷⁶⁾	1 case of NSCLC patient (SCC)	<ol style="list-style-type: none"> Herbal medicine <ol style="list-style-type: none"> Hangam-dan: Coicis Semen, Panax notoginseng Radix, Hippocampus Kelloggii, Cordyceps Militaris, Santsigu Tuber, Ginseng Radix, Bovis Calculus, Margarita, and Moschus Pyungpe-eum, Maekmundong-tang

Study	Patients	Intervention
Park, ⁷⁷⁾	1 case of NSCLC patient (adenocarcinoma, stage IV, cT3N1M1a)	1. Herbal medicine (Taeumin Galgeunhaegi-tanggami)
Kim, ⁷⁸⁾	1 case of NSCLC patient (adenocarcinoma, stage IV, T4N0Mx) & 3 cases of NSCLC patients (SCC, stage IIIb, IV)	1. Herbal medicine (Hang-am plus)
Lee, ⁷⁹⁾	1 case of NSCLC patient (adenocarcinoma, stage IV, cT1N2M1)	1. Herbal medicine (<i>Rhus Verniciflua Stokes</i>)
Son, ⁸⁰⁾	1 case of LC (stage IIIb, T3N1M0)	1. Acupuncture (LU9, SP3, HT8, LU10, LU8, K17, SP3, KI3) 2. Herbal medicine (Samjahwadamjeon, Mundongcheongpeum, Samchulbope-tang) 3. Moxibustion (BL13, Ashi point) 4. cupping (Su points, SI11, S19, CV17)
Yi, ⁸¹⁾	1 case of LC patient	1. Herbal medicine (Geumsoyukgunjeon)
Park, ⁸²⁾	1 case of NSCLC patient (adenocarcinoma, stage IV, T1N0M1)	1. Herbal medicine 1) Hang Am Plus: Coix lachryma-jobi seed, Panax notoginseng root, Hippocampus kelloggi, Cordyceps militaris, Cremastra appendiculata tuber, Panax ginseng root, Bos taurus calculus, Pteria martensii, and Moschus moschiferus 2) Myunyeok Plus: Astragalus membranaceus, Salvia miltiorrhiza, Hericium erinaceum, and Panax ginseng 3) Soshiho-tang, Soyo-san, Dohongsamul-tang, Banhasashim-tang 2. Acupuncture (SP02, HT08, SP01, LR01, SP03, LU09, TE06, KI02, LU08, SP03, HT08, CV06, BL15) 3. Pharmacopuncture (Bee venom and placenta pharmacopuncture were used in turns on the acupoints CV12 and GV3) 4. Physical therapy (cupping, TENS, light therapy) 5. Thermotherapy, hydrotherapy (Moxibustion (CV12 and KD1), foot bath, hot pack) 6. Aromatherapy 7. Massage therapy 8. Meditation therapy 9. Supportive therapy 10. Exercise therapy
Lee, ⁸³⁾	13 cases of NSCLC patients (stage IIIb, IV)	1. herbal medicine (<i>Rhus Verniciflua Stokes</i>)
Hong, ⁸⁴⁾	1 case of NSCLC patient (adenocarcinoma, pT1bN0, stage IA2)	1. herbal medicine (Banhahubak-tang, Gamiondamtang) 2. acupuncture (EX-HN3, CV17, LU5, LI4, ST36, LR3, SP6, SP3, ST40, GB39, EX-B2, CV21, CV20, L14)
Song, ⁸⁵⁾	1 case of NSCLC patient (stage IIIC)	1. herbal medicine (gami shigyungbanha-tang, sojadodam-tang, gunggwihyangso-san gamibang, hwaggigyegi-tang gamibang)
Lee, ⁸⁶⁾	1 case of NSCLC patient (adenocarcinoma, T4N0M0, stage IIIB)	1. herbal medicine (<i>Rhus Verniciflua Stokes</i>)

Study	Patients	Intervention
Kim, ⁸⁷⁾	1 case of HCC patient with lung metastases	1. herbal medicine (<i>Rhus Verniciflua Stokes</i> , dokhwajihwang-tang)
Jang, ⁸⁸⁾	1 case of HCC patient with lung metastasis	1. pharmacopuncture (wild ginseng, cordyceps militaris, prunella vulgaris) 2. nasal fumigation 3. herbal medicine (bulhwangeum junggi-san) 4. moxibustion (CV4, CV8, ST25) 5. foot bath (herbal medicated, bojungikki-tang)
Lim, ⁸⁹⁾	1 case of HCC patient with lung metastases	1. herbal medicine (<i>Dendropanax morbifera</i>)
Lee, ⁹⁰⁾	1 case of bladder cancer patient with lung metastasis	1. pharmacopuncture (wild ginseng, Cordyceps sinensis, Trichosanthes kirilowii, Platycodon grandiflorus) 2. herbal medicine (Soramdan, CS distillate, Gunchildan, Hyunamdan, Hangamdan S) 3. Soram nebulizer solution
Lee, ⁹¹⁾	1 case of NSCLC patient (SCC, stage IV)	1. pharmacopuncture (wild ginseng, Cordyceps sinensis, Trichosanthes kirilowii) 2. herbal medicine (Soramdan)

NSCLC: Non-Small Cell Lung Carcinoma, SCC: Squamous Cell Carcinoma, LC: lung Cancer, LN: Lymph Node, EGFR: Epidermal Growth Factor Receptor, SCLC: Small Cell Lung Carcinoma, HCC: Hepatocellular Carcinoma, RUL: Right Upper Lobe

5) Evaluation variables

(1) Efficacy evaluation variables

Several efficacy evaluation variables were used in each case, and they were tumor size based on Response Evaluation Criteria in Solid Tumors (RECIST), changes of symptoms, duration of survival, the quality of life, tumor markers and so on. The changes of symptoms were not only about the symptoms from cancer itself, but about the side effects from conventional treatment, which was covered in five reports. The instruments for evaluating the quality of life were Eastern Cooperative Oncology Group Performance Status (ECOG PS), Functional Assessment of Cancer Therapy-Lung (FACT-L), Functional Assessment of Chronic Illness Therapy- Fatigue (FACIT-F), European organization for research and treatment of cancer quality of life questionnaire, Core 30 (EORTC-QLQ C30), and EORTC QLQ- lung cancer 13 (EORTC QLQ-LC13). Two cases evaluated metastasized tumor, both of which were about brain metastasis. All the details are provided in the Table 2. (Table 2)

(2) Safety evaluation variables

The safety was evaluated by checking adverse effects using blood test (liver and kidney function test mainly) or N CI-CTCAE. Details are in the table 3.

6) Major results

As a result of evaluating the tumor size, partial response (PR) was in 12 cases – including “decrease” of tumor size, and stable disease (SD) was in 22 cases – including “no interval change.” On the other hand, time to progress (TTP), evaluated by the tumor size based on RECIST, was used in one study. The median TTP was 182 (range, 36-738) days in the study. The duration of survival was measured in 11 case reports, showing extended length of survival than the expectancy of corresponding stage. The quality of life was evaluated in 17 cases, all of which reported improved QOL or stable satisfactory QOL except one case of worsening. Meanwhile, the improvement of symptoms was evaluated in all cases except for two cases. Especially, 6 cases reported the improvement of side effects from chemotherapy or surgery. (Table 2)

Table 2. The Outcome Measurements and Results of the Included Studies.

Study	Outcome measurements	Results
Tumor size		
Park, ⁴⁵⁾ 2007	Tumor size (Chest-CT)	1. Size of tumor stabilized. 2. Pleural effusion decreased.
Park, ⁴⁸⁾ 2015	1. Symptoms (NRS) 2. LFT 3. Chest CT	1. NRS decreased. 2. LFT stabilized. 3. Tumor size slightly decreased.
Ha, ⁵²⁾ 2018	1. Tumor size (RECIST) 2. NCI-CTCAE 3. Blood test 4. ECOG PS 5. Symptom	1. Stable disease 2. No change in NCI-CTCAE grade 3. No change in LFT; tumor marker stabilized or slightly decreased. 4. ECOG PS grade lowered.
Park, ⁵³⁾ 2014	1. Symptom 2. Blood test 3. Tumor size (Chest CT)	1. Cough and pain improved. 2. Total protein, albumin, r-GTP, CRP, WBC and PLT stabilized. 3. Tumor size decreased; pneumonia diminished.
Bang, ⁵⁵⁾ 2008	1. Symptoms 2. Tumor size (Chest CT, PET-CT)	1. Symptoms improved. 2. Stable disease
Kim, ⁵⁶⁾ 2011	1. Tumor size (Chest CT) 2. Symptom	1. Tumor size decreased. 2. Dyspnea improved
Kim, ²⁷⁾ 2015	1. Tumor size (Chest CT) 2. ECOG PS	1. Decreased mass size 2. Stable ECOG PS
Kim, ⁶⁹⁾ 2017	1. NRS 2. Tumor size RECIST 3. NCI-CTCAE 4. Blood test 5. QoL (ECOG PS)	1. Improved NRS 2. Stable disease 3. Stable NCI-CTCAE grade 4. Stable LFT; decreased tumor marker 5. Improved ECOG PS
Park, ⁷⁰⁾ 2005	1. Tumor size (Chest XR, CT) 2. Symptoms	1. Partial response 2. Symptoms improved
Zheng, ⁷¹⁾ 2011	1. Tumor size (Chest CT) 2. VAS 3. ECOG PS (QoL) 4. Blood test	[CASE 1] 1. Stable disease 2. No change in VAS score 3. Stable ECOG PS 4. Stable LFT and kidney function
		[CASE 2] 1. Stable disease; aggravation of pleural effusion 2. Decrease in VAS score 3. Stable ECOG PS 4. Stable LFT and kidney function
		[CASE 3] 1. Stable disease 2. Decrease in VAS score 3. Aggravation of ECOG PS 4. Stable LFT and kidney function
Choi, ⁷⁵⁾ 2005	1. Tumor size (Chest XR) 2. survival	1. Partial response 2. 8 years of survival
Kim, ⁷⁸⁾ 2009	1. Tumor size (Chest CT) 2. symptoms	[CASE 1] 1. Stable disease 2. Improved symptoms
		[CASE 2] 1. Increase of tumor size (decrease → increase)

Study	Outcome measurements	Results
Kim, ⁷⁸⁾ 2009	1. Tumor size (Chest CT) 2. symptoms	2. Improved symptoms [CASE 3] 1. Stable disease 2. Improved symptoms [CASE 4] 1. Increase → stable disease 2. Improved symptoms
Lee, ⁸³⁾ 2009	1. Time to progression (TTP) 2. CTCAE	1. TTP median 183 2. no significant AE
Lee, ⁸⁶⁾ 2009	1. Tumor size (Chest CT) 2. ECOG PS	1. Slight decrease in tumor size and loss of pleural effusion. 2. ECOG PS maintained.
Kim, ⁸⁷⁾ 2016	1. Tumor size (Chest CT) 2. ECOG PS 3. progression-free survival (PFS)	1. Lung metastases disappeared 2. ECOG PS improved 3. Over 25 months of PFS (출판시까지)
Jang, ⁸⁸⁾ 2018	1. Tumor size (Chest CT) 2. Tumor marker (CA19-9) 3. Blood test	1. Reduction in size of metastatic nodules in lungs 2. Tumor marker decreased 3. Decreased AST and LDH, normal ALT, ALP, t-bil, BUN, Cr
Lim, ⁸⁹⁾ 2014	1. Tumor size (Chest XR, CT) 2. Tumor marker (AFP, PIVKA II) 3. Symptoms	1. Lung metastases disappeared 2. AFP and PIVKA II level decreased. 3. Symptoms improved
Lee, ⁹⁰⁾ 2014	1. Tumor size (Chest XR)	1. tumor size increase -> nearly disappeared
Symptom		
Lee, ⁴⁶⁾ 1999	1. Brain CT/MRI 2. Chest XR or CT 3. Muscle test (Lakin)	1. Motor and urination was improved. 2. No change in brain-CT.
Cha, ⁴⁷⁾ 1997	1. Blood test (ALP) 2. Symptoms 3. Chest XR, MRI	1. ALP level decreased. 2. Hemoptysis stopped. 3. Tumor size stabilized 4. Improved pneumonia
Lee, ⁵⁰⁾ 2009	1. NCI-CTCAE (headache) 2. VAS (headache)	1. NCI-CTCAE grade lowered. 2. VAS decreased.
Park, ⁵¹⁾ 2014	1. Symptoms (VAS) 2. Blood test 3. Chest XR	1. VAS score decreased. 2. LFT stabilized; WBC, neutrophil, and CEA decreased. 3. Pleural effusion improved.
Park, ⁵⁷⁾ 2014	1. Symptoms	1. Delirium, constipation, and appetite improved.
Choi, ⁵⁸⁾ 2003	1. Symptoms 2. Chest PA, CT 3. Blood test	1. Symptoms improved. 2. NIC → meta to RLL → improvement of RLL → NIC 3. Total protein and Hb stabilized.
Hong, ⁵⁹⁾ 2014	1. NRS	1. NRS score lowered.
Kim, ⁶⁰⁾ 2009	1. Symptoms (BPI, VAS) 2. Analgesic dose	1. Symptoms improved. 2. Analgesic dose reduction
Kwon, ⁶²⁾ 2009	1. Chest CT 2. ECOG PS(survival extended)	[CASE 1] 1. Progression → NIC 2. ECOG PS improved [CASE 2] 1. PR→no remarkable change 2. Stable ECOG PS

Study	Outcome measurements	Results
Gu, ⁷⁴⁾ 2011	1. BDI, HRSD 2. BAI, ASI 3. Symptoms	1. Improved depression 2. Improved anxiety 3. Improved symptoms
Son, ⁸⁰⁾ 2009	1. Chest XR 2. Symptoms 3. QLQAKA	1. No change in tumor size; haziness and lobulated pleural lesion improved. 2. Improved symptoms 3. Improved QLQAKA
Yi, ⁸¹⁾ 2003	1. Symptoms	1. Improved symptoms
Song, ⁸⁵⁾ 2017	1. Chest XR 2. inflammation markers (WBC, neutrophil counts, ESR, CRP, procalcitonin) 3. symptoms	1. Chest XR improved 2. inflammation marker level decreased. 3. symptoms improved.
QoL		
Song, ⁶¹⁾ 2012	1. QoL 2. Chest CT, XR 3. Survival duration	1. QoL improved 2. Chest CT result was WNL. 3. 15 years of survival (until the time of publication)
Yu, ⁶³⁾ 2008	1. Chest CT 2. QoL 3. Blood test	1. Slight increase in tumor size 2. QoL improved 3. Stable LFT
Park, ⁶⁸⁾ 2011	1. VAS, FACT-L, FACIT-F 2. Chest CT	1. Increased VAS; stable FACT-L, FACIT-F (improvement for 1 week) 2. Decrease of pleural effusion; aggravation of pneumonia
Park, ⁸²⁾ 2010	1. Survival 2. Chest CT 3. Symptoms	1. Disease-free survival for 28 months without adjuvant chemotherapy. 2. Neither metastasis nor recurrence occurred during this period. 3. Exertional dyspnea recovered to NYHA grade 1. Other physical and psychological symptoms were alleviated.
Lee, ⁹¹⁾ 2013	1. ECOG PS 2. Tumor size (Chest CT)	1. ECOG PS improved 2. increased size → decreased size → stable disease
Adverse event due to conventional treatment		
Choi, ⁴⁹⁾ 2017	1. NRS (skin rash) 2. NCI-CTCAE 3. Blood test (CRP, fibrinogen)	1. NRS decreased. 2. NCI-CTCAE grade lowered. 3. CRP and fibrinogen stabilized.
Park, ⁵⁴⁾ 2011	1. NCI-CTCAE	1. NCI-CTCAE grades lowered.
Choi, ⁷²⁾ 2010	1. ROM 2. Physical examination (HSBT, MWT) 3. VAS 4. Abdominal discomfort	1. Improved ROM 2. Improved HSBT, stable MWT 3. Improved VAS score 4. Improved abdominal discomfort
Park, ⁷³⁾ 2012	1. Blood test 2. VAS 3. NCI-CTCAE 3. ECOG PS	1. Stable LFT and CBC 2. Improved VAS 3. Improved NCI-CTCAE grade 4. Improved ECOG PS
Park, ⁷⁷⁾ 2015	1. symptoms(NRS)	1. Improved symptoms
Hong, ⁸⁴⁾ 2016	1. EORTC QLQ-C30, LC13 2. NRS (pain) 3. Global assessment (dyspnea)	1. EORTC QLQ improved 2. NRS score improved 3. Global assessment dyspnea improved
Survival duration		
Choi, ⁶⁴⁾ 2012	1. Chest CT 2. Survival duration	1. No change of tumor size; pleural effusion improved

Study	Outcome measurements	Results
Park, ⁶⁵⁾ 2010	1. Chest CT 2. ECOG PS 3. Blood test 4. NCI-CTCAE (insomnia) 5. Survival duration	1. Increase of tumor size 2. Stable ECOG PS 3. Stable LFT and kidney function 4. Stable NCI-CTCAE grade
Kim, ⁶⁶⁾ 2011	1. Chest CT, XR 2. Blood test 3. Survival duration	1. Progression of metastases and pleural effusion 2. Stable LFT
Kang, ⁶⁷⁾ 2015	[CASE 1] 1. Symptoms 2. RECIST 3. ECOG PS (QoL) 3. Survival duration	[CASE 1] 1. Symptoms improved; TB developed 2. Stable Disease → pleural effusion, bone metastases, NIC in tumor state 3. Stable ECOG PS, sustained good quality of life
	[CASE 2] 1. RECIST 2. ECOG PS (QoL) 3. Blood test	[CASE 2] 1. Increase of tumor size 2. Stable ECOG PS 3. Stable LFT and tumor marker for 6 years
Yoo, ⁷⁶⁾ 2007	1. Chest CT 2. survival	1. Stable disease 2. 7 years of survival
Lee, ⁷⁹⁾ 2011	1. Chest CT 2. ECOG PS 3. Blood test 4. Survival	1. Increase of tumor size → Stable disease (paclitaxel/carboplatin) → PD (hold) → PD (gefitinib) → PR (pemetrexed) 2. Stable ECOG PS 3. Stable LFT and kidney function 4. Survival for 41 months

CT: Computed Tomography, MRI: Magnetic Resonance Imaging, XR: X-ray, ALP: Alkaline Phosphatase, NRS: Numeric Rating Scale, LFT: Liver Function Test, NCI-CTCAE: National Cancer Institute - Common Terminology Criteria for Adverse Events, CRP: C-Reactive Protein, VAS: Visual Analogue Scale, WBC: White Blood Cell, CEA: Carcinoembryonic Antigen, RECIST: Response Evaluation Criteria In Solid Tumors, ECOG PS: Eastern Cooperative Oncology Group Performance Status, r-GTP: Gamma-glutamyl transferase, PLT: Platelet, NIC: No Interval Change, RLL: Right Lower lobe, Hb: Hemoglobin, BPI: Brief Pain Inventory, QoL: Quality of Life, WNL: Within Normal Limits, TB: Tuberculosis, FACT-L: Functional Assessment of Cancer Therapy - Lung, FACIT-F: Functional Assessment of Chronic Illness Therapy - Fatigue, ROM: Range of Motion, HSBT: Hand to Shoulder Blade Test, MWT: Mouth Wrap Test, CBC: Complete Blood Cell Count, BDI: Beck's Depression Inventory, HRSD: Hamilton Rating Scale for Depression, BAI: Beck's Anxiety Inventory, ASI: Anxiety Status Inventory, QLQAKA: Quality of Life Questionnaire for Adult Korean Asthmatics

Discussion

Cancer patients and their family are physically, psychologically, and socio-economically burdened by the side effects and the limitation of conventional treatment.¹⁵⁾ For this reason, patients are seeking for complementary and alternative medicine including KM with the growing demand on cancer treatment of KM, and different types of treatment by KM practitioners are in clinical use indeed.¹⁶⁾ However, in the circumstance where no little medical doctors of western medicine prohibit patients from receiving KM

treatment, the barrier to treat cancer patients is quite high for KM doctors currently, so treating cancer in KM is less generalized than treating other diseases such as musculoskeletal disorders. In consequence, KM doctors frequently search for case reports of similar cases to figure out treatment methods and their effects, obtain knowledge on therapeutic approach of KM on cancer, and apply them in clinics. The doctors require valid information on diagnosis, prognosis, and prevention in daily clinical practice, but the time to deal with it is comparatively limited.¹⁷⁾ Thus we decided an integrative study is needed – which integrates and

analyzes those individual case reports. Therefore, this study analyzed case reports on lung cancer treated by KM, and reorganized the types of patients visiting KM clinics, the treatment methods, the result and the prognosis of patients to make it applicable to clinical practice.

The number of studies searched in the international database (PubMed and EMBASE) was fewer than that of articles in the national databases. The reason why case reports on KM are hard to find in the international databases may be related to the phenomenon where the most journals are reluctant to publish case reports because the low citation index of the case report negatively influences the impact factor of the journal.¹⁸⁾

Regarding the trend of publishing case reports by year, it has been constant since 1997, and especially in 2011, 7 case reports were published at the peak. Only 18 cases were reported in the recent 5 years, taking up less than 38% of the total, which is rather insufficient compared to the increasing demand on KM treatment. The domestic journals with the most publication are the journal of Korean traditional oncology and the journal of internal Korean medicine.

The total number of patients reported in the studies were 68, and except for 5 patient with lung metastasis originated from liver, rectal, and bladder cancer, 63 patients had primary lung cancer. The types of lung cancer included NSCLC in 41 patients and SCLC in 6 patients, with higher percentage of NSCLC patients, because NSCLC takes up 85% of the lung cancer.¹⁹⁾ Among the NSCLC patients were 12 cases of squamous cell carcinoma and 22 cases of adenocarcinoma which is dominant; this result corresponds to the steady trend of increasing percentage of squamous cell carcinoma in Korea as long as the north America and Japan.²⁰⁾ Meanwhile, SCLC were only in 6 cases, half of which did not describe whether limited or extensive stage. In consideration of it, SCLC has not been widely dealt

with in clinical KM, and further case reports are to be expected to accumulate.

Advanced cancer with metastasis were found in 40 cases, which accounts for 59% of the total. This reflects the characteristic of lung cancer; more than 40% of NSCLC are diagnosed after developing metastasis, which is stage IV,¹⁹⁾ and two thirds of SCLC are found with distant metastasis other than chest wall at the point of diagnosis.²¹⁾ Assuming that the case reports are reflection of virtual clinic, the number of advanced lung cancer patients are considerable, and KM treatment reflecting this clinical reality needs to be established. In clinics, the characteristic of lung cancer to be easily metastasized should be considered when treating patients.

The number of patients under combined standard treatment and KM was 25 in the selected cases reports. The number of patients under KM therapy alone was 40, for prevention of recurrence/metastasis or treating side effects after finishing standard treatment, due to refusal to receive standard western treatment, or due to old age. More precisely, 6 patients were under periodic follow-up or prevention of recurrence/metastasis or treating side effects after the conventional treatment of surgery, chemotherapy, and radiotherapy; for 8 patients, it was difficult to continue the conventional therapy due to side effects; 1 patient could not receive the western medical treatment due to old age; 3 patients for palliative treatment; and 22 patients refused the conventional treatment. The reasons of refusal were weakened physical strength, old age, concerns about side effects, preference for natural therapy, and experience of aggravation or severe side effects even after conventional treatment. A considerable number of patients refused the conventional treatment, which is frequently seen in the KM hospital specialized for cancer. If the patient is eligible for the standard treatment and is expected to benefit from it, KM therapy alone

may involve an ethical issue, so the physician should be decided depending on the condition of the patient. Meanwhile, 6 patients were under KM therapy alone to prevent recurrence/metastasis or treat side effects after finishing the conventional treatment. In recent KM clinics, patients with this kind of purpose are emerging, and they complain of anxiety about recurrence/metastasis of residual tumor without any medical treatment after the end of conventional treatment. Not only case reports but also experimental studies on herbal medicine effective in preventing recurrence or metastasis have been published,^{22), 23)} so these are considered to be helpful for patients applied in clinic as evidence.

Targeted therapy was mostly used as chemotherapy combined with KM therapy. This owes to lively carried out genetic research on the mechanism of carcinogenesis of lung cancer, so NSCLC was able to be classified by genetic mutation, resulting in the development of the targeted agents for each mutant gene.²⁴⁾ Meanwhile, there were 3 cases of improving side effects from these targeted agents by treating with KM; cutaneous adverse reaction of EGFR inhibitors, olmutinib and gefitinib, was improved by herbal medicine therapy. One of the cases reported the improvement of other adverse effects of gefitinib other than skin reaction, such as tingling of extremities, general weakness, and diarrhea, treated with acupuncture and moxibustion. It is reported in the systemic review that complementary herbal medicine therapy to chemotherapy lessens the side effects of it and improves the quality of life,²⁵⁾ and these cases could make the examples.

The types of KM treatment were herbal medicine, acupuncture, electro-acupuncture, moxibustion, pharmacopuncture, cupping, and so on. The most frequently used herbal medicine was allergen-removed *Rhus verniciflua* Stokes (aRVS). *Rhus verniciflua* has been used to treat tumors for a long time, and herbal

medicine obtained from dried *Rhus verniciflua* is *geonchil* (乾漆).²⁶⁾ *Geonchil* is the representative herb to treat neoplastic diseases, which is described as “old static blood (瘀血) and accumulation (積) resulted from old static blood” in traditional Korean medicine.²⁷⁾ Experimental studies showed that *geonchil* induces apoptosis,²⁸⁾ inhibits tumor cell growth²⁹⁾ and angiogenesis,³⁰⁾ and the retrospective chart review of 40 cases confirmed that aRVS extends survival in lung cancer patients.³¹⁾ Following aRVS was the cases of using HAD, HAP, and Soramdan. HAD is anti-cancer herbal medicine consisting of *Coicis Semen*, *Panax notoginseng*, *Radix Hippocampus Kelloggii*, *Cordyceps Militaris*, *Satsigu Tuber*, *Ginseng Radix*, *Bovis Calculus*, Margarita, and Moschus, with its effect proven by the experiments.^{32), 33)} HAP is composed of *Coix lachrymal Semen*, *Panax notoginseng Radix*, *Hippocampus kelloggi*, *Cordyceps Militaris*, *Satsigu Tuber*, *Ginseng Radix*, *Bovis Calculus*, Margarita, and Moschus. *Panax notoginseng* and *Cordyceps militaris* are known to block vascular epithelial growth factor (VEGF) and induce apoptosis to prevent recurrence and metastasis of cancer by experiments.^{34), 35)} Also, the water extract of HAP is reported to inhibit tumor cell growth by anti-angiogenic activity³⁶⁾ and to be safe without blood toxicity through animal testing.³⁷⁾ Soramdan is composed of wild ginseng.⁹⁰⁾ Previous studies reported that wild ginseng showed anticancer effect in the human lung cancer cell line³⁸⁾ and in patients with lung cancer relatively.³⁹⁾ The cases analyzed in this study are the instances of applying these experimental research in clinics based on effective results – which is significant in that the experimental studies indeed reach out to clinics for clinical verification. More and more case studies need accumulate to build the evidence of cancer treatment. Other herbal medicine to improve the patient’s symptoms are Bojung-ikki-tang, Maekmundong-tang, Geumsuyukunjun, and so on. These are prescribed to

treat typical symptoms of lung cancer patients such as cough, dyspnea, and general weakness. In the actual clinical practice, there are more instances of treating the symptoms accompanied by cancer as the primary purpose of treatment,⁴⁰⁾ so these prescriptions may be helpful for practitioners. Besides, two cases reported improvement of adverse effect on skin from epithelial growth factor receptor inhibitor by using modified Samul-tang, which can be useful in treating patients with similar side effects of chemotherapy in KM clinics.

Acupuncture points used in acupuncture and moxibustion treatment were varied; the mostly used were *su points* on bladder meridian, such as BL13 and BL17, and some cases used lung-tonifying acupuncture of Sa-am acupuncture. Other tools of treatment included electroacupuncture, pharmacopuncture, light therapy, aromatherapy, sitz bath, and foot bath, which is considered to satisfy the patients' needs if used in clinics.

Various objective and subjective measurements to evaluate efficacy were suggested in the case reports. The objective measurements included imaging tests to identify the tumor size or pleural effusion, tumor response according to RECIST, blood test to check the level of tumor marker, and the length of survival. The subjective measurements were changes in symptoms of subjective complaints and the QOL. Evaluation on the QOL of cancer patients is considered important in treating them and assessing their status along with the survival rate and the tumor response,⁴¹⁾ and there has been plenty of studies on the QOL.⁴²⁾ Although specialized questionnaires by type of cancer have been developed, there were only two cases of using such a questionnaire in this study unfortunately. More objectified evaluation would be possible if practitioners further utilize these questionnaires when assessing the patients' QOL.

Safety evaluation measurement was done by blood test and observing adverse effects. The liver and kidney

function was tested in blood test. Adverse effects were analyzed with the international criteria, Common Terminology Criteria for Adverse Events (NCI-CTCAE), only in 8 cases. The use of herbal medicine is increasing followed by the growing interest in the safety of herbal medicine. Under current medical system of South Korea, a number of patients including cancer patients take medicines prescribed in hospitals of KM and Western medicine respectively. These medicines are metabolized by drug-metabolizing enzymes and may effect activation of them. Some of them may turn into toxic substance through metabolic process, so they need special caution when used together.⁴³⁾ Therefore the safety evaluation should be taken strictly, and adverse effects need to be evaluated based on international criteria to accumulate data for more precise and safe KM treatment, not only in research but also in clinics.

On the perspective of effectiveness and safety, these studies had effects in diverse ways and safety as well. Regarding the tumor response, partial response was reported in 12 cases, stable disease was in 22 cases, 50% of the total cases, which is a high level of tumor response. Furthermore, all 11 cases with the evaluation on the length of survival showed prolonged survival than the expectancy of corresponding stage, with the stable QOL during survival. Although the cases are small in number and limited to lung cancer only, but the results are encouraging. Meanwhile, more and more patients demand improvement of side effects and QOL according to the cases reviewed in this article in KM practice of cancer. 16 out of 17 cases with QOL evaluation reported improved or stable QOL, and side effects of surgery or chemotherapy were improved in all relevant cases.

We integrated and analyzed case reports on lung cancer in the society of KM in Korea. For practitioners, it is important to check cases and apply them in clinical

practice, and evidence based medicine (EBM) is considered to be the fundamental knowledge and skill of medical profession when making clinical decisions.¹⁷⁾ EBM is defined as integration of the latest research evidence, clinical experience of the practitioner, and the value of patients.⁴⁴⁾ The latest research evidence means patient-centered clinical study, and case reports are considered low level of evidence to apply in studies. However, under current situation where large-scale randomized controlled trials about KM treatment on lung cancer are scarce, case reports can be alternative to higher level of evidence. Furthermore, the insight into patient, intervention, and outcome drawn from the discussion will make the foundation for well-designed clinical trial suitable for the characteristics of KM treatment.

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