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## Original article

# Survey the proportions of TCM symptoms and patterns in stable COPD patients at University Medical Center HCMC

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**Abstract:** *Introduction:* COPD affects the quality of a patient's life and leads to death. Identifying TCM symptoms and clinical patterns proportions in the community will make diagnosis and treatment more effective. In Vietnam, there were no epidemiological documents about COPD in TCM. Therefore, this study wished to survey stable COPD patients to find out the proportions of symptoms and patterns in TCM to create a basis for further practice. *Methods:* The survey was conducted as a descriptive cross-sectional study. Participants were stable COPD outpatients at the Clinic and respiratory function test of the University Medical Center HCMC from September to December 2018. According to the survey form based on the TCM diagnostic criteria, the proportions of symptoms and patterns were recorded. *Results:* After three months, 116 patients were recruited. The proportions of 30 TCM symptoms and signs were recorded. The proportions of patients were as follows: 80.17% met Lung qi deficiency, 76.72% for Lung-kidney qi deficiency, 53.45% for Lung-kidney qi and yin deficiency, 47.41% for Lung-spleen qi deficiency, and 2.59% for not meeting any of the diagnostic criteria. Patterns were overlapping in the same patients. *Conclusions:* All TCM symptoms and patterns in the diagnostic criteria appeared in COPD patients. The deficiency of the Lung and Kidney was the most common. Most patients were classified into many different patterns with multi organs damage. More multicenter studies with bigger participants numbers are suggested.

## 1. INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is now a common disease in the world. In 2017, it was estimated that 3 million death cases of COPD are reported globally each year, with being predicted to rank 3rd and 5th for disability and diseases worldwide and COPD would remain a major healthcare problem for decades [1,2]. According to a report by Xuyen Thi Nguyen et al. in 2010, in Vietnam, the proportion of COPD over the age of 40 was 4.2%, of which 7.1% was male and 1.9% was female, 25% of beds in respiratory faculty [3]. Most patients were at the end stage and were at high risk of death, severely affecting their quality of life.

Nowadays, there are more new methods including Traditional Chinese medicine (TCM) that can help improve the efficacy of treatment. TCM when combined with Western Medicine brings higher efficacy [4,5,6,7]. In TCM, there is no term called COPD. According to symptoms that appear in this disease, different clinical patterns will be diagnosed and there will be corresponding treatment. Those patterns are caused by damage to three organs including Lung, Spleen, and Kidney; the qi and the yin parts [8]. There are four common clinical TCM patterns in COPD including Lung qi deficiency (LQD), Lung-spleen qi deficiency (LSQD), Lung-kidney qi deficiency (LKQD), Lung-kidney qi and yin deficiency (LKQYD) [8].

Identifying symptoms and patterns proportions in the community will make diagnosis and treatment more effective.

Meanwhile, in Vietnam, there were no epidemiological documents about COPD in TCM. Therefore, this study wished to survey stable COPD patients to find out the proportions of symptoms and patterns in TCM to create a basis for further practice.

## 2. MATERIALS AND METHOD

### 2.1. Study design and participants

A descriptive cross-sectional study was performed in outpatients who met inclusion criteria including age 18 years or older and being diagnosed with stable COPD according to GOLD 2017 guidelines [9]. Patients excluded were the ones not agreeing to participate or being in exacerbation of COPD or not cooperating in conducting interviews or being not healthy enough to conduct interviews and exams including dyspnea, fatigue, mental disease that cannot answer the questions. The reporting of this study has followed the STROBE guidelines [10].

### 2.2. Sample size and sampling

Since no previous studies used these diagnostic criteria to survey the proportions of patterns, we used P=0.5 to obtain the largest sample size. The formula to calculate the sample size is:

$$N = z_{1-\alpha/2}^2 \frac{P(1-P)}{d^2} = 384 \ people$$
(with α=0.05, $z_{1-\alpha/2}^2$=1.96, P=0.5, d=0.05)

N is desired sample size; α is type-I error; $z_{1-\alpha/2}^2$ is critical value and a standard value for the corresponding level of confidence (at 95% CI or 5% level of significance (type-I error) it is 1.96); P is expected prevalence; d is margin of error or precision [11].

### 2.3. Study settings

#### 2.3.1. Data collection instrument

A survey form set up based on diagnostic criteria included two parts: General information and Survey information. In the General Information section, the variables included: gender, age, occupation, and smoking status. In the Survey information section, there are 17 symptoms and 13 signs taken from the diagnostic criteria.

#### 2.3.2. Survey administration

The survey was performed at the Clinic and respiratory function test of the University Medical Center Ho Chi Minh City from September to December 2018. After the patients completed their appointment, we approached and then selected the ones who met the inclusion criteria and did not meet the exclusion criteria. If the patients agreed to participate, they would be interviewed and examined directly by the surveyor according to the survey form. The survey time was from 15 to 20 minutes and each participant was surveyed only once. The surveyor interviewed and examined directly the participants according to the checklist in the survey form, then recorded the results of the variables. To prevent the "multiple participation" of participants, each participant would have a hospital medical record code to identify

duplicates. Collected data would be imported and stored by using Epidata 3.1 software.

#### 2.3.3. Study preparation

Only one member of the research team participated in the sampling. Before sampling, this surveyor was trained by the research team.

#### 2.3.4. Blinding

In this study, the outcome assessors were blinded by ensuring that they were not the surveyor.

### 2.4. Statistical method

#### 2.4.1. Variables

Age was the variable calculated as the current year minus the patient's year of birth. Sex was the variable that included Male and Female. Age and sex were based on the patient's national identity card. Occupation with four groups included farming, intellectual, workers, and others. Smoking was calculated as the number of packs smoked in a day multiplied by the number of years smoked (pack.year).

Symptoms and signs in the diagnostic criteria for patterns according to TCM were mostly defined by the World Health Organization international standard terminologies and another document [12,13]. They had two values: "yes" and "no".

The patterns variables had two values "yes" and "no" based on the following diagnostic criteria. There were four common patterns with the following diagnostic criteria [8], the English translation of these were partly based on the study of Li SY et al. [6]:

*LQD:*

Symptoms of LQD included the following: (1) coughing and shortness of breath which are worse when active; (2) lassitude and spontaneous sweating, which are worse when active; (3) being prone to catching a cold; (4) a pale tongue with white fur, deep thready pulse or thready weak pulse. As long as the patients showed any three symptoms (1), (2), (3), or (4), LQD was diagnosed.

*LSQD:*

Symptoms of LSQD included the following: (1) coughing and shortness of breath which are worse when active; (2) lassitude and spontaneous sweating, which are worse when active; (3) being prone to catching a cold; (4) poor appetite or eating less; (5) bloating in the gastric cavity, abdominal distension or loose stools; and (6) an enlarged tongue with a white or greasy fur and deep thready pulse, deep slow pulse or thready weak pulse. As long as the patients showed any two symptoms (1), (2), or (3), along with any two of symptoms (4), (5), or (6), LSQD was diagnosed.

*LKQD:*

Symptoms of LKQD included the following: (1) panting, shortness of breath, which are worse when active; (2) lassitude and spontaneous sweating, which are worse when active; (3) being prone to catching a cold; (4) weakness in the lower back and knees; (5) tinnitus, vertigo, or asthenia facial edema; (6) profuse urine, frequent urination at night, or urine released with coughing; and (7) a pale tongue with white fur, deep thready pulse or thready weak pulse. As long as the patients

showed any two of symptoms (1), (2), or (3), along with any two of symptoms (4), (5), (6), or (7), the pattern of LKQD was diagnosed.

### *LKQYD:*

Symptoms of LKQYD included the following: (1) panting and shortness of breath, which are worse when active; (2) lassitude, which is worse when active; (3) being prone to catching a cold; (4) weakness in the lower back and knees; (5) tinnitus and dizziness; (6) a dry cough or scanty sputum and difficult in spitting; (7) spontaneous sweating or night sweating; (8) feverishness in the palms and soles; and (9) a pale or red tongue with thin and little fur, and a thready pulse, thready weak pulse or thready rapid pulse. As long as the patients showed any two of symptoms (1), (2), or (3), along with any one of symptoms (4), or (5), and any two of the symptoms (6), (7), (8), or (9), the pattern of LKQYD was diagnosed.

### 2.4.2. Statistical analysis

Data were processed by Epidata 3.1. The numeric variables missing data would be replaced by the mean or median value and the categorical variables missing data would be removed. The age and smoking variables were presented in Mean±SD. The sex, occupation, TCM symptoms, signs, and patterns variables were presented in percentage (%). Statistical analysis was processed by R.

### 2.5. Ethical considerations

The research was approved by the Ethics Council of the University of Medicine and Pharmacy Ho Chi Minh City on August 28, 2018, according to Decision No. 300/ĐHYD-HĐĐĐ.

## 3. RESULTS

### 3.1. Participants

During the 3 months from September to December 2018, we approached 143 patients. 116 patients who met inclusion criteria and did not meet the exclusion criteria had been recruited. Among the 27 patients who did not participate, 22 did not agree to participate, and 5 had dyspnea that could not speak. Participants completed 100% of the survey form.

### 3.2. Participant characteristics

The number of male patients was 114 (98.28%) and for females was 2 (1.72%). The average age of 116 patients surveyed was 68.78 ± 9.91 years. In which, there were no patients under 40 years old. Half of the participants were farmers, 11.21% for intellectuals, 10.34% for workers and trading, 18.11% for others. The number of patients smoking was 108, 93.10% of participants and 46.53 pack-year.

### 3.3. The proportions of symptoms of TCM

Common symptoms in COPD patients which occurred in more than half of patients were: shortness of breath which is worse when active (97.41%); coughing (87.07%); lassitude which is worse when active (82.76%); enlarged tongue (68.97%); profuse urine, frequent urination at night (66.38%); weakness in the lower back and knees (59.48%); dry cough or scanty sputum and difficult in spitting (53.45%); tongue with

white fur; rapid pulse (50.00%). The frequencies and proportions of symptoms of TCM in stable COPD patients were shown in Table 1.

**Table 1.** Frequencies and proportions of symptoms/signs of TCM in stable COPD

| No. | Symptoms/signs | Freq (N=116) | Prop (%) (N=116) |
|---|---|---|---|
| | *Symptoms* | | |
| 1 | Panting, shortness of breath which is worse when active | 113 | 97.41 |
| 2 | Coughing | 101 | 87.07 |
| 3 | Lassitude which is worse when active | 96 | 82.76 |
| 4 | Profuse urine, frequent urination at night | 77 | 66.38 |
| 5 | Weakness in the lower back and knees | 69 | 59.48 |
| 6 | Dry cough or scanty sputum and difficult in spitting | 62 | 53.45 |
| 7 | Poor appetite or eating less | 47 | 40.52 |
| 8 | Being prone to catching a cold | 44 | 37.93 |
| 9 | Bloating in the gastric cavity, abdominal distension | 42 | 36.21 |
| 10 | Tinnitus | 42 | 36.21 |
| 11 | Spontaneous sweating which is worse when active | 38 | 32.76 |
| 12 | Feverishness in the palms and soles | 32 | 27.59 |
| 13 | Dizziness | 28 | 24.14 |
| 14 | Night sweating | 19 | 16.38 |
| 15 | Vertigo | 17 | 14.66 |
| 16 | Urine released with coughing | 12 | 10.34 |
| 17 | Loose stools | 8 | 06.90 |
| | *Signs* | | |
| 18 | Enlarged tongue | 80 | 68.97 |
| 19 | Tongue with white fur | 58 | 50.00 |
| 20 | Rapid pulse | 56 | 48.28 |
| 21 | Deep pulse | 46 | 39.66 |
| 22 | Thready pulse | 40 | 34.48 |
| 23 | Pale tongue | 36 | 31.03 |
| 24 | Red tongue | 36 | 31.03 |
| 25 | Weak pulse | 33 | 28.45 |
| 26 | Tongue with thin and little fur | 28 | 24.14 |
| 27 | Tongue with greasy fur | 19 | 16.38 |
| 28 | Geographic tongue | 18 | 15.52 |
| 29 | Asthenia facial edema | 16 | 13.79 |
| 30 | Slow pulse | 1 | 00.86 |

### 3.4. The proportions of patients with COPD meeting the TCM patterns

There were 80.17% of patients meeting the diagnostic criterion for LQD; 76.72% for LKQD; 53.45% for LKQYD; 47.41% of the patients meeting the diagnostic criterion for

LSQD. 3 patients did not meet any of the criteria with the proportion of 2.59%.

The survey showed that one patient could meet many diagnostic criteria for different TCM patterns, this showed the damage to multiple organs including Lung, Spleen, Kidney, qi and yin. The overlap between patterns is shown in Table 2. From Table 2, we see that 15.52% of patients met diagnostic criteria for only one clinical pattern, 23.28% of patients met criteria for 2 patterns, 38.79% met criteria for 3 and 19.83% met criteria for all four patterns.

**Table 2.** Overlap between patterns

| No. | Group | Cases that meet diagnostic criteria | Freq (N=116) | Prop (%) (N=116) | |
|---|---|---|---|---|---|
| 1 | Meet diagnostic criterion for 1 pattern | LQD | 11 | 9.48 | 15.52 |
| 2 | | LKQD | 3 | 2.59 | |
| 3 | | LSQD | 2 | 1.72 | |
| 4 | | LKQYD | 2 | 1.72 | |
| 5 | Meet diagnostic criteria for 2 patterns | LQD and LKQD | 10 | 8.62 | 23.28 |
| 6 | | LQD and LSQD | 6 | 5.17 | |
| 7 | | LKQD and LKQYD | 6 | 5.17 | |
| 8 | | LSQD and LKQD | 3 | 2.59 | |
| 9 | | LQD and LKQYD | 1 | 0.86 | |
| 10 | | LSQD and LKQYD | 1 | 0.86 | |
| 11 | Meet diagnostic criteria for 3 patterns | LQD and LKQD and LKQYD | 25 | 21.55 | 38.79 |
| 12 | | LQD and LSQD and LKQD | 16 | 13.79 | |
| 13 | | LSQD and LKQD and LKQYD | 3 | 2.59 | |
| 14 | | LQD and LSQD and LKQYD | 1 | 0.86 | |
| 15 | Meet diagnostic criteria for 4 patterns | LQD and LSQD and LKQD and LKQYD | 23 | 19.83 | 19.83 |
| 16 | Not meet any diagnostic criteria | | 3 | 2.59 | 2.59 |
| **Total** | | | **116** | **100.00** | **100.00** |

*Abbreviations: LQD, Lung qi deficiency; LKQD, Lung-kidney qi deficiency; LSQD, Lung-spleen qi deficiency; LKQYD, Lung-kidney qi and yin deficiency.*

## 4. DISCUSSION

### 4.1. Participant characteristics

Most of the patients were male (98.28%). The mean age was $68.78 \pm 9.9$ years. In which, there were no patients under 40 years old. This was consistent with the COPD epidemiology which usually occurs in male patients aged over 40 years old [2,9]. In terms of occupation, farming had the highest proportion, equal to half of the patients participating in the survey. In Vietnam, it was easy to see that farmers were very often exposed to smoke from firewood and they also smoked more often. More than 93% of patients surveyed were smokers. The average pack-year number was 46.53. This was consistent with the COPD epidemiology with the main risk factor being smoking [2,9]. However, the 46.53 pack-year figure was too high.

### 4.2. The proportions of symptoms of TCM

All of the TCM symptoms described appeared in stable COPD. In 116 patients surveyed, there were 113 patients with panting, shortness of breath which was worse when active (97.41%). This showed that most of the patients who came to the department were in the severe stage of the disease. The symptom of coughing had a lower proportion but was still very high (87.07%). There were 82.76% patients with lassitude which was worse when active, which was also a high number. This showed

that the quality of life in COPD patients was at a low level. In addition, more than one-third of patients had symptoms of LQD such as being prone to catching a cold (37.93%) and spontaneous sweating which was worse when active (32.76%).

There are three symptoms manifesting dysfunction of the Spleen, including poor appetite or eating less, bloating in the gastric cavity or abdominal distension, loose stools. In which, the proportions of symptoms of poor appetite or eating less and bloating in the gastric cavity or abdominal distensions were 40.52% and 36.12%, much higher than loose stools symptoms (6.90%).

There were seven symptoms manifesting Kidney qi deficiency, including weakness in the lower back and knees; tinnitus; vertigo; asthenia facial edema; profuse urine; frequent urination at night; urine released with coughing. In which, more than half of patients had: profuse urine, frequent urination at night (66.38%); weakness in the lower back and knees (59.48%). This can be explained by the average age of the patients surveyed was nearly 69 years old, which was the period of deficiency of Kidney qi [14].

There were three symptoms manifesting yin deficiency, including dry cough or scanty sputum and difficulty in spitting; night sweating; feverishness in the palms and soles. In which, the symptom of dry cough or scanty sputum and difficulty in spitting

had the highest proportion (53.45%). This Yin deficiency can be caused by the heat from cigarette smoke [14].

Tongue signs included: pale tongue, red tongue, enlarged tongue, white fur, thin fur, little fur, greasy fur, geographic tongue. The substance of the tongue was pale, enlarged, reflecting the damage with 31.03% and 68.97% respectively. In which, the pale tongue was a sign utilized in the diagnostic criterion of the LQD, while enlarged tongue was put into the diagnostic criterion of Spleen qi deficiency.

The fur of tongue signs included: white fur; thin and little fur; greasy fur; geographic tongue. In which, the proportion of white fur was 50.00%. The proportion of signs of thin and little fur or geographic tongue manifested Yin deficiency was 24.14% and 15.52% respectively. The proportion of the sign of greasy fur showing dampness was used in the diagnostic criterion of Spleen qi deficiency was 16.38%.

Pulse signs included: deep pulse; slow pulse; rapid pulse; thready pulse; weak pulse. In which, the rapid pulse had the highest proportion of nearly half of the patients (48.28%), showing a heat status. The deep pulse manifested interior diseases, but only 39.66% of 116 patients had this sign, while 113 patients classified into patterns did have interior diseases. The sign of slow pulse manifested visceral diseases with much phlegm and pertained to the cold signs group. This was used in the diagnostic criterion of LSQD and had a very low proportion of only 0.86%.

### 4.3. The proportions of TCM patterns in stable COPD

According to the diagnostic criteria of TCM patterns in stable COPD, there are 4 patterns including LQD, LSQD, LKQD, LKQYD. Although the data showed that all patients manifested at least one symptom of LQD, only about 80% of the total patients met the diagnostic criterion of LQD. This could be explained that the diagnostic criterion for LQD needed more groups of symptoms that manifested the deficiency of Lung qi to diagnose than other complex patterns.

The proportion of patients meeting the diagnostic criterion of LKQD was 76.72%. This showed that the number of patients with manifestations of Kidney qi deficiency was quite high. Sun Chenwei et al. (2021) used other diagnostic criteria and there was only one clinical pattern similar to ours, which is LKQD. There were 24% of patients classified into this pattern while in our study this proportion is more than three times higher (76.72%) [15]. This difference may be because this study used different diagnostic criteria, the study population was also different, and it could also be because the signs assessment was still subjective.

The proportion of patients meeting the diagnostic criterion of LKQYD was very high with more than half of the surveyed patients (53.45%). This indicated that the proportion of Yin deficiency in COPD patients was also high. Similar to the case of the LKQD pattern, Lyu Jinjie and Zhou Mingping (2019) used other diagnostic criteria and there was only one pattern the same as the one in our study was LKQYD pattern with the proportion of 22.5%, less than half of our study (53.45%) [16]. This difference can be explained as in the case of the LKQD pattern.

For the LSQD pattern, the number of patients meeting this criterion was less than other patterns, but the proportion was nearly half the number of patients surveyed (47.41%). Although this pattern had the lowest proportion, it showed that there was a significant presence of Spleen disorder in the clinic. Thus, the pathogenesis of COPD in TCM had the role of the Spleen.

In many cases, we could see the overlap of patterns occurring shown in Table 2. With the diagnostic criteria of four patterns, there are 16 possible cases and we recorded all 16 of these cases. More than 80% of patients met the diagnostic criteria for many different patterns. Most of the patients had multi-organ lesions of the Lung, Spleen, Kidney, qi, and yin. This may be different for patients in the whole community because we sampled at the highest level medical center in Vietnam which had patients with more severe diseases.

According to the data, many patients had Yin deficiency symptoms such as feverishness in the palms and soles, night sweating, rapid pulse, red tongue, thin and little fur, geographic tongue but did not be classified as LSKQYD because of the lack of symptoms of Kidney deficiency. This showed that the Lung yin deficiency (LYD) pattern appeared in the clinic but had no diagnostic criterion.

In 116 patients surveyed, there were 3 patients not meeting any of the diagnostic criteria (2.59%). These patients had few sporadic symptoms (manifested in various visceral symptoms), so they did not meet any of the criteria.

### 4.4. The strength and limitations

This study was the very first one in Vietnam about the proportions of TCM symptoms and patterns in COPD. The results had given an insight into the proportions of TCM symptoms and patterns in patients with stable COPD at a medical center. However, the number of participants of the study did not achieve the desired sample size number as calculated previously and the survey participated in one center only. The results did not represent the Vietnamese community. Therefore, we need more multicenter studies with bigger participants numbers to be organized for further results.

Moreover, this survey was not piloted and the symptoms/signs descriptions of TCM documents were not clear, so not only reporting symptoms but also signs were subjective and depending on the opinion of the examiner. Intraobserver and interobserver biases were also potential biases in this study as only one surveyor examined the patients once. These are also common limitations of TCM studies. The diagnosis of TCM is mostly based on symptoms and signs. Therefore, we need to develop a uniform standard of symptoms and signs in the future.

To increase the scientificity of TCM studies, we suggest that there should be a consensus of experts to create clearer symptoms and signs descriptions and assessment tools to avoid subjectivity in diagnosis. For further results, we suggest making more multicenter studies with a bigger participants number. When the data represent the Vietnamese community, we could start to create treatment strategies. For example, some herbal preparations will be researched and created based on the most popular pattern.

### Conclusion

The survey of 116 patients recorded the appearance of all TCM symptoms according to the diagnostic criteria for TCM patterns in stable COPD, in which the symptoms of Lung

deficiency and Kidney deficiency had a high occurrence proportion. The proportions of four TCM patterns in descending order: LQD, LKQD, LKQYD, LSQD, and a small percentage did not meet any of the criteria. Patterns were overlapping in the same patients. Although physicians can consider using these criteria to diagnose, we should notice that LYD and multi-organ damage patterns including LSKQD and LSKQYD can usually exist in the clinic though they are not mentioned in this tool.

## FUNDING

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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