



Correlation research between fear of disease progression and quality of life in patients with lung cancer

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Background: Lung cancer has the highest incidence rate and mortality rate of all malignancies. In recent years, the therapeutic effect of lung cancer has been greatly improved, but the fear of disease progression still directly affects the quality of life (QOL) of patients. The aim of this study was to evaluate the factors affecting the progression of fear of disease and its impact on the quality of life in patients with lung cancer.

Methods: From December 2019 to February 2020, 102 patients with lung cancer in the Department of Thoracic Oncology of a top three hospital were investigated by using the simplified fear of disease progression scale (FoP-Q-SF) and the quality-of-life scale for cancer patients (FACT-G). Data were collected and statistically analyzed by SPSS25.0 software.

Results: A total of 110 questionnaires were distributed and 102 valid questionnaires were recovered, indicating a recovery rate of 92.7%. The results of multiple stepwise regression analyses showed that blood group, monthly income, and mood state were the influencing factors for the progression of phobic diseases in cancer patients ($P < 0.05$), and the score of progression of phobic disease was negatively correlated with the quality-of-life score ($r = -0.382$).

Conclusions: The progress of phobic diseases in patients with lung cancer seriously affects their QOL, and further attention by medical staff in providing health education, psychological counseling, social support, and other measures is required.

Keywords: Lung cancer; fear of disease progression; quality of life (QOL)

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Introduction

Cancer has become the second leading cause of mortality, with nearly 1/6 of deaths worldwide caused by the disease (1). Lung cancer has the highest incidence rate among cancer patients in China (2), comprising close to 20% of all malignancies (3). Fear of disease progression, or “fear of

progress” (FoP) (4) in cancer, is a psychological state in which patients are afraid of the possibility of metastasis or recurrence of the disease. One study showed that the FoP score of breast cancer patients in China is mostly moderate (5). Poor quality of life (QOL) is a common problem in all cancer patients, and this problem is more prominent in lung cancer, mainly including physical, social, emotional,

and functional status. It has become a vital consideration in understanding the long-term impact of cancer and its treatment (6), and studies have shown that FoP has a direct impact on QOL in people with interstitial lung disease and prostate cancer patients (7,8). Due to the FoP, patients will have large emotional fluctuations, which will eventually affect the treatment effect and quality of life. At present, there are few studies on FoP in lung cancer patients in China (9), and in this study we hoped to develop an understanding of its relationship with QOL in lung cancer patients to increase awareness in medical settings and the community. We present the following article in accordance with the SURGE reporting checklist (available at <https://apm.amegroups.com/article/view/10.21037/apm-21-2821/rc>).

Methods

Study population

A questionnaire survey was conducted on 110 patients with primary lung cancer in the Thoracic Oncology Department of the Fifth Affiliated Hospital of Sun Yat-sen University from December 2019 to January 2020. The inclusion criteria were: (I) age >18 years old, with self-judgment ability; (II) patients were hospitalized for ≥ 1 day; (III) hospitalized patients with a pathological diagnosis of lung cancer; (IV) patients were conscious, had basic language communication skills, and had the ability to complete the questionnaire survey; (V) patients had a high degree of cooperation and voluntarily accepted the survey and informed consent of their families. The exclusion criteria were: (I) patient's age was less than 18 years old; (II) patients were unconscious and unable to complete the questionnaire; (III) patients were hospitalized repeatedly.

Study methods

The sampling method was used in this study. Comprehensive quality control measures have been taken in the whole process of investigation (including design, investigation and analysis stages), such as rationalization and standardization of problem establishment, pre investigation, and timely study and solve the problems in the investigation. Trained investigators were selected to conduct clinical investigations using a unified questionnaire. All procedures performed in this study involving human participants were in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by ethics board of the Fifth Affiliated

Hospital of Sun Yat-sen University (K247-1) and written informed consent was obtained from all patients.

Patient general information questionnaire

The questionnaire included the general information of patients, as well as blood type, occupation, monthly income, medical burden, place of residence, religious belief, main caregivers, family companionship, mood state, efforts for serious illness, and the decision maker for existing treatment plans.

Simplified Chinese scale for fear of disease progression in cancer patients (FoP-Q-SF)

The scale was developed by Mehnert of Germany on the basis of FoP-Q in 2006 (10), and the simplified Chinese version of the scale (FoP-Q-SF) adopts a Likert 5-point scoring method, with a total of 11 items (11). The evaluation method adopts patient self-evaluation, with a score of 11–55 points, and the higher the patient's score, the stronger their fear of disease progression. The Internal consistency Cronbach's α coefficient is 0.883 in the original FoP-Q-SF total table, and the test-retest reliability was 0.85 after modifying the original scale. The FoP-Q-SF has good reliability and validity and is suitable for the detection of disease progression fear in lung cancer patients.

QOL scale for cancer patients (FACT-G)

This is a specific scale for various tumor patients formed by combining common and specific templates and is especially used to measure the QOL. The scale is mainly divided into four dimensions: physiological, social, emotional, and functional status, with a total of 23 items (12). In this study, a Likert scoring method was adopted for all items of the FACT-G, most of which were positive items, while reverse items were GP1-GP7, GE1, and GE3-GE6. The total score of patients ranged from high to low and indicated that the QOL of patients with lung cancer ranged from good to poor. The value reliability of internal consistency in each field in the original scale α is 0.85, and the test-retest reliability was 0.902 after modifying the original scale. FACT-G has good reliability and validity, and is suitable for the detection of QOL in patients with lung cancer.

Statistical analysis

After the data were collected, SPSS25.0 statistical software was used for descriptive statistics, independent sample *t*-test, one-way analysis of variance (ANOVA), Pearson correlation analysis, and multiple linear regression in the data analysis.

Results

Patients

A total of 110 questionnaires were distributed and 102 valid questionnaires were recovered, indicating a recovery rate of 92.7%. Patients comprised of 45 females (44.1%) and 57 males (55.9%); there were 88 cases (86.3%) of non-small cell carcinoma and 14 cases (13.7%) of small cell carcinoma; and the age range was 25–79 years old, of which those between 51–70 years old (47.1%) accounted for most respondents. Most patients were married (97, 95.1%), and their educational level was concentrated in high school and above (70, 68.6%). See *Table 1* for details.

FoP in cancer patients

Univariate analysis showed that there were statistically significant differences in the level of FoP among lung cancer patients in terms of their monthly income, blood type, medical insurance type, main caregivers, family companionship, and mood ($P < 0.05$), see *Table 1* for details.

Multiple stepwise regression analysis of FoP

Taking the statistically significant factors obtained from the univariate analysis of FoP as the independent variable and the total score of FoP as the dependent variable, the FoP was analyzed by multiple stepwise regression. The results showed that the monthly income, mood state and blood type of lung cancer patients all affected the FoP ($P < 0.01$), and the total coefficient of certainty was 0.291, indicating these three variables could explain 29.1% of the variation of the total FoP score. The assignment of independent variables of FoP and the results of multivariate analysis are shown in *Tables 2,3*.

QOL in patients with lung cancer

The total standardized QOL score of lung cancer patients was 56.15 ± 21.69 . The standardized scores of the four dimensions of QOL were physiological dimension (108.5 ± 28.52), emotional dimension (58.73 ± 23.96), functional dimension (57.11 ± 25.15), and social/family dimension (32.95 ± 30.21), see *Table 4*.

Progress of phobia in patients with lung cancer

The FoP score of the 102 patients was 25.5 ± 6.06 , which indicated a medium level. Among them, 18 patients had

mild disease (17.65%), 69 had moderate disease (67.65%), and 15 had severe lung cancer (14.7%). The top three items with the highest scores are shown in *Table 5*.

Correlation between fear, disease progression, and QOLI in patients with lung cancer

The QOL score of lung cancer patients was significantly negatively correlated with the total score of FoP ($r = -0.382$). Among them, the QOLI was positively correlated with the scores of social/family dimensions in the FoP ($r = 0.77$), and negatively correlated with the scores of physiological dimensions ($r = -0.271$), emotional dimensions ($r = -0.289$), and functional dimensions ($r = -0.242$) in the FoP, as shown in *Table 6*.

Discussion

A total of 102 questionnaires were collected in this study, of which the proportion of men and women was 57:45. Most patients were middle-aged and elderly, and more than 60% had intermediate and higher education. Most had non-small cell lung cancer, which were mostly advanced adenocarcinoma.

As we all know, anti-tumor treatment and drug side effects are inevitable. However, excessive worry, what we call fear of disease progression, will aggravate this subjective feeling of patients themselves. Finding out the objective factors affecting the progress of fear disease will help patients maintain a good attitude and accept everything calmly. The mood status of patients affected the FoP, with those in good mood and with a cheerful personality having a lower score and stronger tolerance for the disease (13). The monthly income of lung cancer patients also affected the FoP, with those with high income often receiving better and more timely treatment, and attracting a lower score. These findings show it is necessary for legislators to improve medical insurance and related policies for cancer patients to reduce the financial burden on patients (14).

The blood type of lung cancer patients also affected the FoP score. The results of this study showed that those with type B, AB, and O blood were more significantly afraid of disease progression than patients with type A. This result differs from those of previous studies and may be related to the controversial blood group theory (15), which suggests people with type O blood may have a lower risk of disease than other blood types.

In this study, while most patients experienced FoP,

Table 1 Univariate analysis results of fear disease progression score of patients' general information (n=102)

Characteristics	Cases (n)	Percentage (%)	Fear disease progression score	F/t	P
Sex				-0.60	0.55
Male	57	55.9	25.18±5.49		
Female	45	44.1	25.91±6.75		
Age (years)				0.87	0.46
18–30	3	2.9	27.00±6.25		
31–55	36	35.3	25.44±6.09		
56–70	48	47.1	26.13±5.96		
>70	15	14.7	23.33±6.34		
Medical insurance				-0.08	0.93
Yes	101	99	25.50±6.09		
No	1	1	26.00		
Pleural effusion				1.61	0.11
Yes	6	5.9	29.33±6.12		
No	96	94.1	25.26±6.00		
Marriage				0.35	0.56
Yes	5	4.9	25.43±6.11		
No	97	95.1	25.28±4.79		
Degree of education				1.47	0.23
Junior high school and below	18	17.6	24.89±6.05		
High school	37	36.3	24.65±5.70		
Junior college	33	32.4	25.52±6.53		
College and above	14	13.7	28.5±5.49		
Chemotherapy				0.58	0.57
Yes	82	80.4	25.56±5.64		
No	20	19.6	24.8±7.67		
Radiotherapy				0.45	0.65
Yes	34	33.3	25.88±5.51		
No	68	66.8	25.31±6.34		
Targeted therapy				-0.69	0.49
Yes	42	41.2	25±6.74		
No	60	58.8	25.85±5.56		
Immunotherapy				-0.73	0.94
Yes	13	12.7	25.38±4.03		
No	89	87.3	25.52±6.31		

Table 1 (continued)

Table 1 (continued)

Characteristics	Cases (n)	Percentage (%)	Fear disease progression score	F/t	P
Blood type				4.51	0.005**
A	33	32.4	22.55±7.22		
B	24	23.5	27.71±5.07		
AB	12	11.8	56.42±4.3		
O	33	32.4	26.52±4.97		
Monthly income				9.76	0.00**
≤3,000	34	33.3	28.26±5.8		
3,000–5,000	34	33.3	36.79±4.17		
5,001–10,000	27	26.5	20.93±6.21		
≥10,000	7	6.9	24.43±5.29		
Medical burden				1.31	0.28
No burden at all	4	3.9	24±2.31		
Basically no burden	14	13.7	23±9.22		
Have a certain burden	42	41.2	26.55±5.01		
Have a heavy burden	42	41.2	25.43±5.88		
Residence				0.05	0.96
City	16	15.7	25.51±6.16		
Countryside	86	84.3	25.44±5.67		
Occupation				1.82	0.17
Worker	21	20.6	25.67±7.1		
Farmer	13	12.7	25.69±4.99		
Cadre	8	7.8	24.8±10.05		
Medical staff	2	2.0	23		
Teacher	14	13.7	22.29±6.27		
Merchant	10	9.8	26±5.14		
Others	34	33.3	26.79±4.67		
Religious belief				0.005	0.99
Yes	4	3.9	25.75±3.10		
No	98	96.1	25.49±6.16		
Primary caregiver				3.16	0.007**
Mate	73	71.6	25.27±5.74		
Children	13	12.7	28.66±5.28		
Parents	1	1.0	25		
Brothers and sisters	1	1.0	35		
Medical staff	9	8.8	26.67±5.77		
Escort	1	1.0	19		
Others	4	3.9	16.25±6.19		

Table 1 (continued)

Table 1 (continued)

Characteristics	Cases (n)	Percentage (%)	Fear disease progression score	F/t	P
Family company				2.93	0.038*
All day	67	60.9	26.54±5.11		
Visit every day	24	21.8	22.54±7.69		
2–3 times a week	7	6.4	26.71±6.8		
Once a week	4	3.6	23.76±3.78		
Mood				8.34	0.00**
Very good	11	10.8	22.45±3.59		
Good	45	44.1	23.2±6.5		
General	38	37.3	28.32±4.85		
Range	8	7.8	29.25±3.66		
What degree of effort do you think you should make when you are seriously ill?				0.47	0.63
Save lives as much as possible	82	80.4	25.78±6.38		
It depends on the patient	17	16.7	24.47±4.62		
Artificial methods should not be used to maintain vegetative life	3	2.9	23.67±4.04		
Histology				3.11	0.84
Small cell lung cancer	14	13.7	25.86±7.51		
Non-small cell lung cancer	88	86.3	25.44±5.84		
Non-small cell lung cancer				1.02	0.36
Adenocarcinoma	74	72.5	25.48±5.88		
Squamous cell carcinoma	10	9.8	23.70±7.23		
Others	16	17.7	27.67±6.42		
Stage				0.54	0.58
Stage II and below	9	8.7	27.22±6.61		
Stage III	65	63.8	25.11±5.91		
Stage IV	28	27.5	25.86±6.32		

*, indicates $P < 0.05$; **, indicates $P < 0.01$.

the score was 25.5 ± 6.06 points, which is considered a moderate level, and is basically consistent with the results of previous studies. In Table 5, the top three items with the highest scores in the questionnaire were the impact of the disease on patient's families, side effects of drugs, and work troubles. This may be because: (I) Chinese society generally has a strong concept of family, and not being a burden to family is important (16). At the same time, the complications or death caused by disease progression bring irreparable psychological and economic trauma to

the families of patients (17). (II) Chemotherapy drugs used by cancer patients often cause adverse reactions (18), and bring further fear and potential resistance to the treatment. (III) Both illness and its treatment may disrupt the normal working lives of patients (19), and increase the economic burden of patients and their families (20).

Table 6 shows that the distribution of FoP in patients with lung cancer was significantly negatively correlated with the QOL score ($r = -0.382$, $P < 0.05$), indicating that the higher the level of FoP, the lower the QOL. The

Table 2 Assignment of independent variable (n=102)

Independent variable	Assignment method
Did you receive immunotherapy	Yes =1, no =2
Did you receive chemotherapy	Yes =1, no =2
Medical burden	No burden at all =1, basically no burden =2, have a certain burden =3, have a heavy burden =4
Blood type	A =1, B =2, AB =3, O =4
Occupation	Worker =1, farmer =2, cadre =3, medical staff =4, teacher =5, merchant =6, others =7
Monthly income (Yuan)	≤3,000 =1, 3,001–5,000 =2, 5,001–10,000 =3, ≥10,000 =4
Primary caregiver	Mate =1, children =2, parents =3, brothers and sisters =4, medical staff =5, escort =6, others =7
Family company	All day =1, visit every day =2, 2–3 times a week =3, once a week =4
Mood state	Very good =1, good =2, general =3, range =4

Table 3 Multiple stepwise regression analysis of fear of disease progression in cancer patients (n=102)

Independent variable	Nonstandard coefficient		Standardized partial regression coefficient	T value	P value
	B	Standard error			
Constant	20.4	2.73	–	7.47	0.00**
Mood state	2.701	0.678	0.352	3.986	0.00**
Very good	–				
Good	0.745	1.846	–	13.57	0.00**
General	5.861	1.879	0.47	3.119	0.002**
Range	6.795	2.55	0.303	2.665	0.009**
Monthly income (Yuan)	–1.707	0.587	–0.264	–2.91	0.004**
≤3,000	–				
3,001–5,000	–1.265	1.309	–0.099	–0.966	0.336
5,001–10,000	–7.133	1.391	–0.522	–5.128	0.00**
≥10,000	–3.63	2.239	–0.152	–1.621	0.108
Blood type					
A	–				
B	5.163	1.546	0.363	3.339	0.001**
O	3.97	1.419	0.308	2.797	0.006**
AB	3.871	1.943	0.207	1.992	0.049*

Regression equation $R^2=0.291$, adjusted $R^2=0.269$, $f=13.382$, $P<0.01$. *, indicates $P<0.05$; **, indicates $P<0.01$.

FoP score was significantly negatively correlated with the scores of physiological dimension, emotional dimension, and functional dimension ($r=-0.271$, -0.289 , -0.242 , $P<0.05$), which mimic the results of other studies (21). This may be due to (I) the patients' lack of knowledge

of cancer, doubts about the possibility of a cure, or fear of the adverse reactions of treatment. These adverse psychological emotions increased the psychological burden of patients and affect their QOL. (II) The emotional, social, and economic support of patients was difficult to

Table 4 Quality of life scores of lung cancer patients (n=102)

Dimension	Score range	Minimum score	Maximum score	Original score, $\bar{x}\pm s$	Standardized score, $\bar{x}\pm s$
Physiological condition	0–28	4	27	19.53±5.13	108.5±28.52
Social/family status	0–24	0	18	11.58±6.94	32.95±30.21
Emotional state	0–16	5	16	11.46±2.64	58.73±23.96
Functional status	0–24	1	17	10.14±4.03	57.11±25.15
Scale score (total)	0–92	28	72	52.71±9.54	56.15±21.69

Table 5 Top three items with the highest scores of fear disease progression scale (n=102)

Top three of FoP items with the highest scores	Item score ($\bar{x}\pm s$)	Very		Quite		Some		A little		Not at all	
		n	%	n	%	n	%	n	%	n	%
I'm worried about what will happen to my family if something happens to me	3.31±0.96	3.0	2.8	52	50.9	28	27.5	12	11.8	7	7
I'm worried that the medicine will affect my body	2.74±1.09	0	0	32	31.4	29	28.4	23	22.5	18	17.7
The idea that I might not be able to work because of illness annoys me	2.59±0.80	0	0	12	11.8	44	43.1	38	37.3	8	7.8

FoP, fear of progress.

Table 6 Correlation analysis between fear of disease progression and quality of life in patients with lung cancer (n=102)

Dimension	r	P
Physiological condition	-0.271	0.006**
Social/family status	0.77	0.443
Emotional state	-0.289	0.003**
Functional status	-0.242	0.014*
Scale score (total)	-0.382	0.000**

*, indicates $P < 0.05$; **, indicates $P < 0.01$.

address, which may also affect their rehabilitation process. To address this, medical staff should take measures to increase the confidence of patients and to reduce FoP, such as reiterating the importance of family and social support to family members, providing ongoing counselling online and via telephone, and maintaining continuous care (22). The QOL score of patients was (56.15±21.69), which was at the medium level (23). It can be seen from *Table 4* that the physiological dimension score of patients with lung cancer was the highest (108.5±28.52 points), while that of society or family was the lowest (32.95±30.21 points), indicating that lung cancer caused considerable work, social, and family stress. In this study, following their

illness, patients found it difficult to engage in their original work, resulting in reduced interpersonal communication and gradual alienation from society, which produced a variety of negative psychological emotions. Therefore, while using chemotherapy, radiotherapy, and other means to treat them, medical staff should attach great importance to the psychological status of patients (24), and encourage patients, families, and all involved parties to maintain close connections with those recovering from the disease.

In general, the fear of disease progression in patients with lung cancer seriously affects their QOL. With the continuous progress of medical treatment, physical disease rehabilitation is not the only factor medical workers should be concerned with, and the humanistic care of patients should be considered a crucial component of healing. Medical workers should pay more attention to patients' FoP and provide more health education, psychological counseling, social support, alleviate fear of disease progression for lung cancer patients to improve their QOL. This study has not investigated the impact of fear of disease recurrence on patients' QOL, and further research in this field is required.

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Footnote

Reporting Checklist: The authors have completed the SURGE reporting checklist. Available at <https://apm.amegroups.com/article/view/10.21037/apm-21-2821/rc>

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study involving human participants were in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by ethics board of the Fifth Affiliated Hospital of Sun Yat-sen University (K247-1) and written informed consent was obtained from all patients.

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