RESEARCH ARTICLE

Influence of Personal Character on Quality of Life of Patients with Esophageal Cancer in North Henan Province and Influencing Factors

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Abstract

The aim of this study was to investigate QoL (quality of life) of patients with esophageal cancer in northern Henan province, China, and to accurate evaluate and reflect the relationship between patient characteristics and QoL. In the high risk area of esophageal cancer in the north of Henan province, 735 patients with esophageal cancer were investigated. The Eysenck personality questionnaire (EPQ) and QoL were analyzed by using the questionnaire of general situation, EPQ, QLQ-C30 and QLQ-OES18. The effects of personal character on the QoL of esophageal carcinoma patients were analyzed by SPSS 11.0 software. The QoL of esophageal cancer patients in Northern Henan region was significantly affected by character. The difference between choleric and type of melancholic temperament types was significant ($P<0.01$), also in OESEAT, OESTA, OESCO and OESSP ($P<0.05$). Differences in personal character can thus influence the quality of esophageal cancer patient lives.

Keywords: Esophageal cancer - quality of life - character

Introduction

Esophageal cancer (EC) is a malignancy occurring in the esophageal epithelial tissue, which accounts for 2% of all malignancies. China is a country where EC rages, ranking first in both its incidence and mortality worldwide (Jonathan & Jonas, 2003; Lagergren, 2010). According to surveys in the 1970s, EC was second only to gastric carcinoma in causing deaths in China; although the EC-caused mortality has decreased according to surveys in the early 1990s, it still ranks third or fourth among various cancers in this country. EC has a high incidence in people between 60 years and 64 years, and its incidence shows a gradual decrease in people over 70 years. In addition, EC presents a characteristic of noticeable geographic aggregation in China: High-incidence and -mortality areas quite concentrate, especially in the north of Henan Province near Taihang Mountains where the average mortality rate is 14.59/100,000, ranking fourth among various malignancies (Cai et al., 2007). Furthermore, EC has a general higher incidence in countrysides than in cities.

Most patients with diagnosed EC receive surgery, radiotherapy, chemotherapy, or biotherapy and then leave off hospital for rest at home. However, long-term treatment always descends patients' physical fitness; most of them lead miserable lives due to complications such as fatigue and weakness, eating difficulty, aphonia, bedsore, or even severe pains; furthermore, such indisposition, as well as other factors such as financial hardship due to long-term treatment is very likely to cause a decrease in patients' mental health, as a consequence of which they present psychological characteristics of depression, frustration, helplessness, or even hopelessness (Chinthakandhi et al., 2009). Such a decrease in mental health further influences patients' quality of life (QOL). Nowadays, although study on QOL of patients with malignancies has attracted more and more attention, that on QOL of patients with EC, especially patients in countryside, is still in its infancy. How to improve curative effect on advanced EC (namely, how to effectively perform secondary prevention) has become a direction of clinical and basic researches at present.

QOL is a term used for an overall assessment of life quality. In most cases, it is counted as an outcome of social policies and development. As QOL has multi-dimensionality and subjectivity, an agreement on how to define it has not been reached worldwide. According to the World Health Organization QOL study group, QOL is a general term for experiences of individuals from different culture and value systems in their living conditions which are related to their goals, expectations, standards, and concerns (Leplege & Hunt, 1997). However, health related QOL is a complex concept with a very broad meaning

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in itself: It has the properties of subjectivity and multi-dimensionality; meanwhile, its meaning varies according different diseases and different populations (Apolone & Mosconi, 1998). Nowadays, study on patients' QOL has become the mainstream of QOL study in the field of medical science. In modern tumor science, an agreement has been reached: The QOL, survival rate, and mortality rate of patients with malignancies can reflect curative effect on malignancies and patients' rehabilitation more accurately (Bottomley, 2002). As QOL involves multiple respects such as health, culture, belief, and value, its measurement methods also vary; among these varied methods, questionnaire is a generally-adopted one. Presently, there are two kinds of rating scales which are used for measuring the influence of tumors on QOL: One kind is rating scales used for measuring the QOL of patients with various tumors (such as EORTC-QLQ-C30 proposed by the European cancer treatment study group), and the other is rating scales for measuring the QOL of patients with specific tumors (such as EORTC QLQ-OES18 for patients with EC and EORTC QLQ-BR23 for those with breast cancer) (Blazeby et al., 2003; Luo et al., 2005).

For EC patients, their QOL is influenced by a variety of factors (Collard et al., 1992; Boer et al., 2004; Viklund et al., 2006). Patients with gastric carcinoma have an overall poor QOL; age, character types, as well as symptoms such as pains, dysphagia and limited eating all have an influence on patients' QOL (Mercadante et al., 2000). In contrast, a high education level, good social support, and outgoing character are all favorable factors of the QOL of patients with colorectal carcinoma (Viola et al., 2006). Character is referred to as an individual's stable and core significance-possessing mental characteristics which are manifested by his attitude towards realities and behavior manner based on the attitude. It embraces the personality characteristics most closely-related to society and the outcome of the interactions between inherent heredity and acquired environment. At present, study on the influencing factors of EC patients' QOL is still in its infancy, and most researches have merely focused on social support, economic status, and genetic susceptibility (Jennifer et al., 2008). Reports on the influence of difference character types on EC patients' QOL remain rare.

To objectively evaluate and reflect the correlation between character and EC patients' QOL, the current study made a detailed investigation into the QOL of patients with EC in north Henan province. Based on this investigation, this study further proposed methods for mental nursing and emotional adjustment. By doing these, this study aims to provide a theoretical basis for improving EC patients' QOL.

Materials and Methods

Subjects

A total of 735 patients with EC from the rural communities of north Henan who received treatment between September 2010 and November 2011 were enrolled. The investigation methods took the forms of questionnaire and interview.

The selection criteria included: 1) diagnosed histopathologically; 2) over 3 months after EC surgery; and 3) well-informed of a pathogenetic condition, fully conscious, and voluntary. Patients meeting any of the following criteria were excluded from this study: 1) complicated with another type of tumor; 2) treated with radiotherapy or chemotherapy before surgery; 3) with psychiosis; and 4) with severe communication disorders (like writing, seeing, and listening) and difficulties in understanding and replying a questionnaire properly.

Subjects and Methods

Investigation methods primarily took the forms of questionnaire and interview. All investigators were postgraduates of the present studying team. They received training before the investigation and knew well about the objectives, significance, procedure, and methods of this study. Household surveys began after investigation standards were unified. Interviews were performed for patients with difficulties in reading and writing. To do this, the items in a questionnaire were read literally without any explanation or suggestion, and the subjects selected their choices independently. Then, the questionnaires were examined minutely by the investigators to ensure the quality of the survey data.

Questionnaire for general data

The questionnaire for general data was comprised of the patient's gender, age, occupation, education level, marriage, source, medical treatment method, household per capita monthly income, familial history, post-surgery survival time, metastasis, complications, accompanied diseases, and so on.

Questionnaire for character assessment

Eysenck personality questionnaire (EPQ) is a tool for measuring personality dimensions. According to EPQ, character can be divided into four types, namely, choleric, sanguine, phlegmatic, and melancholic.

Questionnaire for QOL

The third version of QLQ-C30, developed by the European Organization for Research and Treatment of Cancer (EORTC), is applicable to QOL assessments for patients with various cancers. It is a core rating scale for QOL assessments whose reliability, validity, and sensibility have been proved in many countries. QLQ-C30 has been successfully applied in clinical researches on patients with cancers. Because QLQ-C30 has high reliability, validity, and sensibility, it can be applied for Chinese cancer patients' QOL assessments (Ramage et al., 2003). The items in a QLQ-C30 questionnaire are scored based on classifications; higher scores in the function dimension and holistic health condition indicate a better QOL; in contrast, higher scores in the symptom dimension and six standalone indices always indicate a poorer QOL (Aaronson & Ahmedxai, 1993).

QLQ-OES18 is a specific rating scale related to the specificity of EC and EC treatment also developed by EORTC. It is used to supplement a core rating scale. QLQ-C30 supplemented by QLQ-OES18 for patients'

QoL of Patients with Esophageal Cancer in China and Influencing Factors

Table 1. The Analysis of QLQ-30C with Different Characters of Esophageal Cancer Patients

Items	Scores				P Value					
	A	B	C	D	AB	AC	AD	BC	BD	CD
QL2	64.25±1.41	66.11±1.23	60.49±2.24	53.51±3.82	0.327	0.137	0.007**	0.023*	0.001**	0.101
RF2	71.38±1.63	70.67±1.40	68.25±2.24	62.72±4.14	0.74	0.269	0.05	0.381	0.069	0.246
PF2	76.98±1.45	76.45±1.37	73.05±2.20	69.65±3.21.	0.792	0.138	0.076	0.189	0.097	0.446
EF	69.15±1.48	74.47±1.18	67.91±1.81	57.89±4.91	0.031*	0.996	0.18	0.016*	0.012*	0.309
CF	83.58±1.18	80.07±1.05	74.14±1.99	69.30±4.24	0.141	0	0.013*	0.053	0.1	0.881
SF	70.26±1.57	66.93±1.46	61.49±2.45	57.02±4.25	0.123	0.002**	0.003**	0.054	0.026*	0.355
average	74.27±1.17	73.72±1.03	68.97±1.68	63.32±3.20	0.724	0.011*	0.001**	0.019*	0.001**	0.105
DY	13.26±1.42	13.40±1.37	19.83±2.48	21.05±4.43	0.999	0.128	0.459	0.221	0.568	1
PA	20.76±1.58	20.73±1.25	24.28±2.05	31.14±4.58	0.988	0.185	0.013*	0.173	0.012*	0.126
FA	27.30±1.66	28.74±1.42	31.32±2.12	39.47±3.62	0.498	0.156	0.006**	0.351	0.014*	0.087
SL	20.07±1.76	20.30±1.54	23.56±2.38	46.49±5.27	0.923	0.261	0	0.282	0	0
AP	22.18±1.75	25.11±1.59	27.87±2.38	44.74±5.66	0.768	0.286	0.003**	0.912	0.010*	0.048*
NV	13.69±1.32	17.31±1.32	19.11±2.12	33.33±4.62	0.059	0.034*	0	0.471	0	0.001**
CO	16.98±1.64	15.49±1.43	18.10±2.39	27.19±5.16	0.499	0.7	0.026*	0.363	0.010*	0.066
DI	11.28±1.27	15.06±1.35	17.82±2.02	28.07±5.26	0.223	0.039*	0.020*	0.831	0.118	0.364
FI	37.67±1.82	38.14±1.69	48.56±2.72	59.65±4.89	0.849	0.001**	0	0.001**	0	0.047*
average	20.35±1.02	21.65±0.93	25.61±1.35	36.79±2.91	0.339	0.004**	0	0.026*	0	0

*P < 0.05; *P < 0.01, A, he type of choleric temperament; B, the type of sanguine temperament; C, the type of Lymphatic temperament; D, the type of Melancholic temperament; AB, the type of choleric temperament vs guine temperament

QOL assessments embraces the assessments of patients' objective symptoms and subjective perceptions (Fayers et al., 2001; Blazeby et al., 2003).

Statistical analysis

Excel databases were established. All valid data were analyzed using SPSS11.0 software. Comparisons between groups were performed using chi square tests, and those among groups were performed using one-way ANOVA or nonparametric rank tests for independent samples. The influence of character on QOL was analyzed by ANOVA, which primarily focused on its influence on patients' function and symptom dimensions. P < 0.05 was considered statistically significant.

Results

General data

The 735 EC patients aged from 24 years to 92 years with an average age of 62.59 ± 9.04 years, and those aging from 50 years to 70 years took a proportion of 71.23% of all subjects. Of all patients, 510 were males (69.39%) and 225 were females (30.61%). According to education levels, 179 (24.35%) were illiterate, 252 (34.29%) were primary school-educated, 197 (26.80%) were junior high school-educated, 92 (12.52%) were senior high school- or secondary technical school-educated, and 15 (2.04%) were college-educated or above. 112 patients (15.24%) had a familial history. 223 patients (30.34%) had complications; 224 (30.48%) had accompanied diseases; and 241 (32.79%) were complicated with metastasis. Most patients had received surgery alone, accounting for 72.38%. 632 patients had a disease time within 3 years, accounting for 85.98% of all patients.

Integral character

Patients with choleric and sanguine character took the most part of all patients, which accounted for 36.60%

and 42.45%, respectively. 116 patients were subject to phlegmatic character and 38 were melancholic, accounting for 15.78% and 5.17%, respectively.

Influences of population sociological characteristics on character

The one-way ANOVA of the influences of population sociological characteristics on character showed that sex, age, marriage, occupation, source, treatment method, and family income had no significant influences on patients' character (P > 0.05), whereas education levels influenced their character to some degree (P < 0.05).

Influences of clinical characteristics on personalities

T-tests and one-way ANOVA of the independent samples showed that all clinical characteristics including the familial history of esophageal cancer, complications, accompanied diseases, treatment manners, disease time, and tumor metastasis had no significant influences on personalities (P > 0.05).

Comparisons of the QLQ-C30 scores of patients with different character types

The QOL scores of different character groups were compared. The melancholic group showed significant differences compared with other groups: Its scores in 9 symptom-related indices were noticeably higher than those of any other groups, whereas its scores in the holistic health level and 5 function indices were significantly lower. These results indicate a poorer QOL of the melancholic group. In contrast, the choleric groups showed opposite score trends in all QOL indices compared with the melancholic group, which indicates the highest QOL among all groups.

The influences of different character types on the indices of the holistic health level, functions, and symptoms in QLQ-C30 were analyzed using one-way ANOVA by SPSS11.0 software (Figure 1). The

Table 2. The Analysis of OES18 with Different Characters of Esophageal Cancer Patients

Items	Scores				P Value					
	A	B	C	D	AB	AC	AD	BC	BD	CD
OESDYS	42.21±1.78	43.66±1.69	47.70±2.59	49.41±4.23	0.551	0.091	0.155	0.203	0.251	0.753
OESEAT	19.67±1.29	21.45±1.00	25.43±1.48	32.24±3.95	0.856	0.022*	0.024*	0.15	0.065	0.502
OESRFX	18.84±1.39	25.11±1.39	24.43±2.35	36.84±4.92	0.002**	0.039*	0	0.797	0.005**	0.007**
OESPA	12.72±1.21	12.07±1.00	17.24±1.94	23.10±3.85	0.999	0.26	0.077	0.108	0.048*	0.684
OESSV	13.14±1.63	14.00±1.44	17.24±2.53	20.18±4.08	0.693	0.159	0.122	0.255	0.171	0.55
OESCH	23.92±1.82	24.57±1.63	28.16±2.70	33.33±5.03	0.788	0.193	0.064	0.261	0.083	0.346
OESDM	21.69±1.94	18.48±1.57	19.83±2.71	31.58±5.47	0.197	0.575	0.056	0.678	0.011*	0.035*
OESTA	12.02±1.54	13.14±1.33	14.37±2.42	33.33±5.76	0.995	0.959	0.005**	0.998	0.009**	0.022*
OESCO	19.08±1.58	16.78±1.34	22.41±2.33	32.46±4.95	0.269	0.233	0.002**	0.039*	0	0.033*
OESSP	7.93±1.20	8.12±1.07	13.79±2.35	20.17±4.27	1	0.152	0.049	0.162	0.052	0.718
average	19.31±0.88	19.74±0.75	23.06±1.23	31.26±2.82	0.999	0.08	0.001**	0.125	0.002**	0.059

*P < 0.05; *P < 0.01, A, he type of choleric temperament; B, the type of sanguine temperament; C, the type of Lymphatic temperament; D, the type of Melancholic temperament; AB, the type of choleric temperament vs guine temperament
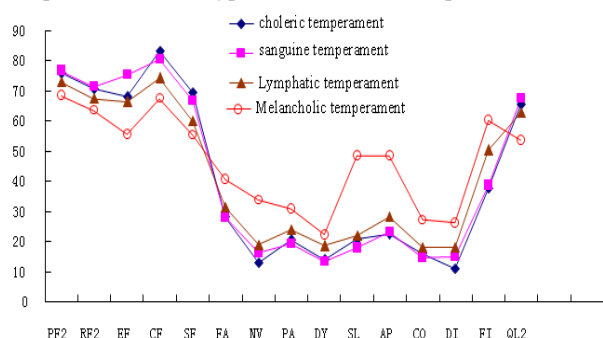

Figure 1. Analysis of the QLQ-C30-based Scores of EC Patients with Different Character Types

Figure 2. Analysis of the OES18-based Scores of EC Patients with Different Character Types

results showed that except for the physiologic and role functions as well as dyspnea in the symptom domain, character noticeably influence the scores in the rest 12 indices. However, different groups displayed more or less variations even in a same index, according to pairwise comparisons: The choleric and melancholic groups showed differences in 11 indices except for the emotional function, among which the differences in the cognitive function, pains, diarrhea, and constipation were significant and the rest 7 differences were very significant; furthermore, the sanguine and melancholic groups showed very significant differences in the holistic health levels, insomnia, nausea and vomiting, and financial straits; moreover, the phlegmatic and melancholic groups showed significant differences in 4 indices, the choleric and phlegmatic groups showed significant differences in 5 indices, whereas the choleric and sanguine groups only showed one significant difference in the emotional function. The results are summarized in Table 1.

Influences of different personalities on the QLQ-OES18-based scores

The OES18-based scores of all symptom dimensions were analyzed based on different character types. The results showed that the melancholic groups got the highest scores in all OES18-based 10 indices, and this group was followed by the phlegmatic group, whereas the rest two groups did not display significant differences in most indices (Figure 2).

The further ANOVA showed that different character types had significant (P < 0.05) or even very significant (P < 0.01) influences on eating, backflow, pains, dry mouth,
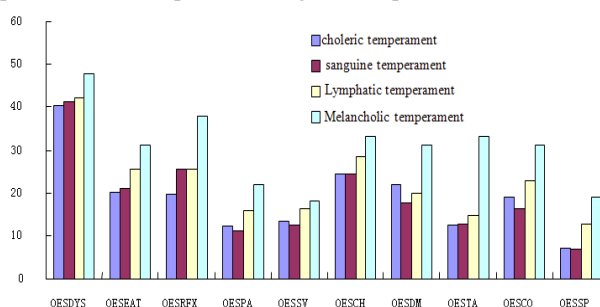
decreased food appetite, cough, and speaking rather than dysphagia, slobber swallowing, and obstruction (P > 0.05). However, pairwise comparisons again displayed variations in a same symptom dimension from group to group. Personality has the most influential effect on backflow: Although the sanguine and phlegmatic groups did not show a significant difference in this index, other groups did show significant or even very significant differences compared with these two groups. Character has relatively weak influences on speaking and eating: Significant differences in these respects were only observed between the choleric and phlegmatic groups, the choleric and melancholic groups, and the sanguine and melancholic groups. Furthermore, the choleric groups showed differences in 5 symptom dimensions compared with the melancholic group, and the sanguine group also displayed differences in 5 symptom dimensions. These results indicate that patients with melancholic character have a great difference in OES18-based QOL compared with patients with other character types. The results are summarized in Table 2.

Discussion

Various factors can influence QOL. Although many studies on QOL of patients with cancer before and after treatment have been reported, they differ greatly in results: Most studies demonstrated that patients' QOL decreases after treatment, some reported no significant difference in the QOL of patients with esophageal cancer before and after treatment, or even some reports claimed that patients' QOL is stabilized or improved after treatment (Carter et al., 1997; Carlsson et al., 2000; Blazeby et al.,

2001; Greimel et al., 2002). These inconsistent results are presumably correlated with differences in subjects' tumor positions and perspectives taken in different researches (Holzner et al., 2004). Nowadays, study on the influencing factors of EC patients' QOL is still in infancy, and most researches have only focused on social support and economic status. Therefore, starting from communities, the present study adopted a household survey method to obtain data which were more objective and reliable than those obtained through telephone surveys. Based on these data, this study further explored the influence of different character types of EC patients on their QOL.

The obtained statistical outcomes and characteristics based on the population sociological data of patients with EC in north Henan in this study are basically consistent to those reported by others. However, there is a difference in the clinical features: The patient with a familial history of EC only took 15.24% of all subjects in this study, which is similar to that reported, but much lower than that reported (32.0%) (Li et al., 2009). This disagreement may be correlated with the fact that some patients were not willing to tell information about their families. In addition, the rates of complications and tumor metastasis of the subjects in this study were also slightly lower. This is presumably credited with progress in technologies of tumor detection and treatment.

The ANOVA of the influences of the population sociological and clinical characteristics on character in this study shows that school education levels other than other characteristics has a significant influence on patients' character. School education levels can obviously influence character types, and the influence is principally manifested by the differences between the illiterate and the non-illiterate as well as between the lowly-educated (below the junior middle school-educated level) and the highly-educated. These findings indicate that early childhood education has some influence on character formation, whereas at a certain age (junior middle school age), the influence of education is no longer noticeable. Character is an individual's personality characteristics represented by his stable attitude towards realities and thus-habitualized behavioral pattern. Character can be shaped, and great changes in living environment can also result in its change. Although this study fails to find out whether EC has an influence on character because the subjects' character before and after EC occurrence was not investigated, it shows that EC clinical characteristics does not significantly influence character.

Character is developed gradually in growth, and it is a behavior manner under the interactions between heredity and development environment (internal and external causes). The ANOVA in this study shows that although patients have varying degrees of differences in the clinical characteristics, these differences do not influence character types significantly. The QLQ-C30 scores (Figure 1, 2) show that the holistic health scores of the choleric, sanguine, phlegmatic, and melancholic groups were 64.25 ± 1.41, 66.11 ± 1.23, 60.49 ± 2.24 and 53.51 ± 3.82, respectively; the sanguine group got the highest score, whereas the melancholic got the lowest. The further analysis of the differences based on pairwise comparisons between different character types (Table 2) show that character greatly influences the scores graded to the indices listed in the QLQ-30C rating scale, which was even more noticeably manifested by the differences in the holistic health levels, function domain, and symptom domain between the choleric and melancholic groups as well as between the sanguine and melancholic groups. This finding sufficiently proves that different character types have significant influences on patients' QOL. Moreover, the OES18-based scores also demonstrate that different character types greatly influence patients' QOL: The difference between the choleric/sanguine and melancholic groups was the most noticeable, whereas that between the choleric and sanguine groups was comparatively small.

Based on the aforementioned, in clinical practice, some nursing items should be performed targeted based on the differences in the QOL of patients with different character types. Although choleric EC patients have high scores in all QOL indices, they have a relatively low score in the emotion function (69.15 ± 1.48). This phenomenon is presumably correlated with their impulsive, grumpy, and restless characteristics. For these patients, great attention should be given to emotional care, the technical operating level of the nursing staff should be increased as high as possible, communication with the patients should be strengthened, the attitude towards them should be mild, and their negative emotions should be handled timely. Sanguine patients have a relatively high holistic health level, but they show some problems in nausea and vomiting (17.31 ± 1.32) and anorexia (25.11 ± 1.59). For them, improvements of these symptoms should be targeted while nursing, basic nursing services should be carefully done, and a good eating environment should be provided. Phlegmatic patients have low scores in cognitive function (74.14 ± 1.99) and social function (61.49 ± 2.45), as well as in economic straits (48.56 ± 2.72). For these patients, great attention should be given to these two functions and their external communication should be strengthened. As for melancholic patients, nursing should be focused on their physiological problems to increase their cognitive function (69.30 ± 4.24), considering that their problems primarily arise from the symptom domain, including insomnia (46.49 ± 5.27), anorexia (4.74 ± 5.66), nausea and vomiting (33.33 ± 4.62), pains (23.10 ± 3.85), and so on.

Acknowledgements

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