ORIGINAL RESEARCH

Assessment of Risk Factors and Cognitive Level Associated with Venous Thrombosis Patients in a Coexistence of Multiple Diseases Study in Shanghai

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Background: Venous thrombosis (VTE) is a high-incidence disease that affects different systems of the body, but no comparative studies have been conducted to explore its incidence in different systems in patients with the coexistence of multiple diseases. Primary care is a medical institution that has the first contact with patients' conditions. The majority of outpatients suffer from multiple diseases, and they are more prone to VTE, which is of significance and requires investigation. At the same time, we observed that the primary care patients' cognition level of VTE is insufficiency at present, and the prevention and management of VTE in China is still in its infancy. Most studies focus on whether doctors and nurses are clear about the diagnosis and manifestations of VTE, however, few studies on patients' cognitive level and influencing factors of symptoms and prevention of VTE. Therefore, it is necessary to study the causes of cognitive deficiency of VTE from the perspective of patients, conduct targeted cognitive and behavioral interventions, and finally achieve the purpose of improving the effect of VTE prevention and management.

Aim: This study aimed to explore the risk factors, cognitive level and cognitive potential influence factors of VTE in outpatients of primary care in Shanghai, as well as which diseases, are more likely to promote occurrence of VTE among patients with multiple diseases.

Methods: A total of 710 patients were included in the analysis. Shanghai in China is divided into urban and suburban areas by their geographical location, and a random sample of 10 primary care areas was investigated, including 5 urban areas and 5 suburban areas. The Padua scale and the VTE cognitive level-related knowledge test scale were used for the investigation. Statistical software was used to conduct univariate Pearson correlation analysis and multivariate logistic regression analysis for VTE high-risk factors among outpatients of primary care. Furthermore, the high-risk factors for VTE and the types of chronic disease in patients with multiple diseases were subjected to subgroup analyses. t-test was used to statistically analyze cognitive level of VTE and the potential influence factors related to the patients' VTE cognitive level.

Results: Univariate analysis of risk factors for VTE in 710 outpatients showed that age (χ^2=83.895, P<0.001), education (χ^2=8.324, P=0.004), region (χ^2=63.936, P<0.001), chronic disease (χ^2=18.198, P<0.001) and the coexistence of multiple diseases (χ^2=61.347, P<0.001) were the main risk factors for VTE risk in patients. Logistic multivariate regression analysis showed that age, region, chronic diseases and the coexistence of multiple diseases were independent risk factors for VTE risk in patients. The correlation between high risk of VTE in patients with multiple diseases and various types of chronic diseases was further analyzed by logistic multivariate regression. The results showed that diabetes mellitus (OR=1.636 [95% CI, 1.030–2.599], P=0.037), cerebral infarction (OR=8.484 [95% CI, 4.615–15.597], P<0.001), coronary heart disease (OR=2.987 [95% CI, 1.699–5.252], P<0.001), intracerebral hemorrhage (OR=15.130 [95% CI, 4.707–48.630], P<0.001), respiratory diseases (OR=3.470, [95% CI, 1.428–8.43], P=0.006) and malignant

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tumors (OR=4.576, [95% CI, 1.85–11.315], *P*=0.001) were independent risk factors for VTE among patients with co-existing diseases, and the risks from high to low were cerebral hemorrhage>cerebral infarction>malignant tumor>respiratory system disease>coronary heart disease> diabetes. In addition, patients' age (*t*=6.869, P<0.001), region (*t*=3.420, *P*<0.001), education level (*t*=−7.341, *P*<0.001), chronic disease (*t*=5.875, *P*<0.001), BMI (*t*=6.404, *P*=0.012), smoking (*t*=4.152, *P*=0.042) were related to the VTE cognitive level.

Conclusion: General practitioners should pay close attention to independent risk factors for VTE among patients in routine outpatient care, especially patients with co-existing diseases with independent risk for VTE, placing them high risk of VTE. At the same time, health education and other measures should be strengthened to improve the patients' awareness and cognitive level of VTE to prevent the occurrence of VTE and its related complications.

Keywords: venous thrombosis, risk assessment, cognitive level

Introduction

Venous thrombosis (VTE) is the third most common vascular disease in the world, second only to acute coronary syndrome and cerebral hemorrhage. VTE not only causes lower limb swelling and pain, which affects the prognosis and recovery, but can also cause a fatal PE due to a mobile thrombus. Even after active treatment, the fatality rate of PE is as high as 11%.[1] At present, clinical studies on the pathogenic causes of VTE are mainly based on Virchow's theory of three pathological factors, which mainly include vein wall injury, blood flow stagnation and blood hypercoagulability. Clinically, it is believed that during the process of VTE, the above three factors exist at the same time and interact with each other to eventually cause disease. As a potentially fatal disease with a variety of risk factors, it can pose a threat to the physical and mental health of patients and their life.[2]

Primary care is involved in government leadership and community participation, and under the guidance of superior health institutions, they are grassroots health institutions centered on people's health, family, and community. They act as a unit for the guidance of women, children, elderly people, chronic ill patients, disabled individuals and poor residents, and are the key to service. They try to solve the main health problems of the community and meet their basic health service needs. They provide preventive measures and medical treatment and health education and effective, comprehensive, continuous grassroots health services. Primary care is the embodiment of the holistic view of medicine in medical practice. Its main content is primary health security, and it is the first part of the medical system to come into contact with the population. Therefore, primary care is the foundation and core of the health system. Primary care has two remarkable characteristics: the service objective is extensive and its community health service is comprehensive, that is, covering prevention, treatment, rehabilitation and health promotion. Their service outside the hospital can be combined with services inside the hospital, and the health department provides family community services. Therefore, primary care should strengthen the patients' understanding of VTE, carry out health education for high-risk patients, and provide corresponding preventive interventions to reduce the incidence of VTE as much as possible.

VTE includes pulmonary embolism (PE) and deep venous thrombosis (DVT). DVT not only causes lower limb swelling and pain, which affects the prognosis and recovery but also causes fatal PE due to shed thrombus. Even after active treatment, the fatality rate is still as high as 11%.[1,3] Therefore, it is very important to evaluate the degree of risk of VTE among outpatients in primary care, strengthen the prevention and education of VTE, and achieve early detection, early diagnosis and early treatment on this basis. VTE is a high-incidence disease in different systems of the human body, but no comparative studies have been conducted to explore its incidence in different systems in the setting of different diseases. At the same time, we observed that the primary care patients' cognition of VTE is insufficiency at present, and the prevention and management of VTE in China is still in its infancy. Most studies focus on whether doctors and nurses are clear about the diagnosis and manifestations of VTE, and few studies on patients' cognition of symptoms and prevention of VTE.[4,5] However, from the perspective of patients, patients' cognitive level of VTE is insufficient, and the influencing factors of VTE cognition are still unknown, so it is aimless to improve patients' cognitive level of VTE in the primary care. Consequently, the purpose of this study was to explore the risk factors of VTE, and the status quo of the cognitive level and cognitive potential influencing factors of VTE among outpatients in Shanghai Primary Care. In addition, we will go further compare the incidence of different systemic diseases in the human body and analyze specifically each disease influencing factor of VTE to improve the attention of general practitioners to screening and

health education about risk factors of VTE among outpatients, finally achieve the purpose of improving the VTE prevention and management effect.

Materials and Methods

Data Source and Sample

This study was conducted in Shanghai, China. The method of random sampling was adopted from January to March 2021. Shanghai is divided into urban and suburban areas according to their geographical location. A random sample of 10 primary care areas was the investigation object, including 5 urban areas and 5 suburban primary care areas.

Inclusion criteria: 1) patients with clear consciousness and cooperation; 2) able to complete the questionnaire survey independently or with the help of staff; and 3) between the ages of 25 and 96 years old.

Exclusion criteria: 1) patients who had been diagnosed with VTE; 2) unable to understand the questionnaire; 3) patients with serious physical and mental diseases; and 4) patients who did not complete the entire questionnaire.

This study was approved by the Chinese clinical trials registry (ChiCTR1800019789). All patients read the study statement and agreed to complete the questionnaire.

The Survey Scale

Two scales, the internal thrombus risk assessment Padua scale and the VTE cognitive level related knowledge test scale,[6] were adopted. The specific contents of the Padua Scale included active cancer, a previous history of VTE, reduced activity, known thrombotic disease, recent (within 1 month) trauma and/or surgery, age ≥70 years, heart failure and/or respiratory failure, acute myocardial infarction or ischemic stroke, acute infection and/or rheumatic disease, obesity (BMI ≥30 kg/m²), and currently on hormone therapy. The grading criteria were as follows: a Padua Scale score 0–3 was classified as low risk, and ≥4 was classified as high risk. According to the actual situation in Shanghai, The VTE cognitive level-related knowledge test table was revised based on the survey scale of Green and Bernhofer,[7] which included the degree of recognition of the importance of VTE, the ability to recognize early symptoms, and the degree of mastery of relevant first aid skills. The specific contents are shown in Annex 1. We can judge the cognitive degree of patients to VTE according to the table's score, and statistically analyze the data to understand the influencing factors of patients' cognition.

Survey Method

The study is based on the principle of randomness and unpredictability, by the electronic questionnaire status survey, and 10 primary care areas in Shanghai as the research object. Electronic questionnaire was used to collect the Padua scale and the VTE cognitive level-related knowledge test table. Tables were completed by the patients in the outpatient department of primary care. Data collection is done by two staff members to ensure its authenticity. To study the risk factors of VTE and the cognitive level and cognitive potential influencing factors of VTE of the patients, collated data were statistically analyzed. Finally, statistically significant results were obtained as risk factors of VTE, cognitive degree and potential influencing factors of VTE.

The Research Content

The basic data of outpatients who went to the outpatient department of the Primary Care, the Padua scale and the VTE cognitive level-related knowledge test table completed by the patients were collected truly, every patient takes about 20 minutes. The relevant factors for the VTE risk degree and cognitive level of the outpatients in the Primary Care were statistical analysis, then the relevant influencing factors and cognitive level of VTE are obtained scientifically.

Statistical Analysis

SPSS 21.0 statistical software was used for data processing. Univariate Pearson correlation analysis and multivariate logistic regression analysis were conducted for the high-risk factors for VTE among outpatients in primary care, and subgroup analysis was conducted for the high-risk risk factors for VTE and the types of chronic diseases in patients with

multiple diseases. At the same time, a *t*-test was used to statistically analyze the cognitive level and factors related to the patients' VTE cognitive level score.

The measurement data are expressed as the mean ± standard deviation (X±S), and were analyzed with *t*-tests. Enumeration data are expressed as percentages (%), and the χ^2 test was used for analysis. P < 0.05 was considered statistically significant.

Results

Basic Information

Among all of the patients, 362 (51%) cases were male, 482 (67.9%) cases were older than 65 years, 395 (55.6%) cases had an education level above primary school, 646 (91%) patients had chronic disease, 652 (91.8%) patients had a BMI < 28 kg/m^2, 352 (49.6%) were urban dwellers, and 176 (24.8%) patients smoked (see Table 1).

Univariate Analysis of the VTE Risk in Community Outpatients

This study analyzed the relevant influencing factors of the risk of VTE, including sex, age, education, region, chronic disease, co-existence of multiple diseases, BMI, and smoking. Univariate analysis showed that age (χ^2=83.895, P < 0.001), degree of education (χ^2=8.324, P=0.004), region (χ^2=63.936, P < 0.001), chronic disease status (χ^2=18.198, P < 0.001), coexistence of multiple diseases (χ^2=61.347, P < 0.001); however, there was no significant difference in sex, BMI and smoking, as shown in Table 2.

Logistic regression method was further used for multivariate analysis, and it was found that the independent risk factors related to the risk of VTE were as follows: age (OR=12.196 [95% CI, 5.645–26.349], P < 0.001), region (OR=0.374 [95% CI, 0.232–0.602], P < 0.001), chronic disease or not (OR=8.896 [95% CI, 1.171–67.589], P=0.035), the co-existence of multiple diseases (OR=2.335 [95% CI, 1.518–3.593], P < 0.001), as shown in Table 3.

Table 1 Analysis of the VTE Risk Score by Different Influencing Factors

Variables	Low Risk	High Risk	χ^2	P value
Gender				
Male, n (%)	277 (39)	85 (12)	1.173	0.300
Female, n (%)	254 (36)	94 (13)		
Age (years)				
<65, n (%)	220 (31)	8 (1)	83.895	<0.001
≥65, n (%)	311 (44)	171 (24)		
Degree of education				
Primary school or less, n (%)	219 (3)	96 (14%)	8.324	0.004
Primary school or above, n (%)	312 (44)	83 (11)		
Region				
Suburb, n (%)	217 (31)	135 (19)	63.936	<0.001
Urban, n (%)	314 (44)	44 (6)		
Chronic disease or not				
No, n (%)	62 (9)	2 (0.2)	18.198	<0.001
Yes, n (%)	469 (65.8)	177 (25)		
Coexistence of multiple diseases				
No, n ()	328 (52)	63 (10)	61.347	<0.001
Yes, n ()	134 (21)	108 (17)		
BMI (kg/m^2)				
≥28, n (%)	39 (5)	19 (3)	1.908	0.206
<28, n (%)	492 (69)	160 (23)		
Smoking				
No, n (%)	408 (57)	126 (18)	2.983	0.089
Yes, n (%)	123 (17)	53 (8)		

Table 2 Multivariate Logistic Regression Analysis of the Risk of VTE in Community Outpatients

Variables	P-value	OR(95% CI)
Region	<0.001	0.374(0.232–0.602)
Age	<0.001	12.196(5.645–26.349)
Degree of education	0.914	0.974(0.602–1.575)
Chronic diseases or not	0.035	8.896(1.171–67.589)
Co-existence of diseases	<0.001	2.335(1.518–3.593)

Table 3 Multivariate Logistic Regression Analysis of VTE High Risk and Various Chronic Diseases in Patients with Multiple Diseases

Variety of Diseases (Each)	P value	OR (95% CI)
Hypertension (488)	0.230	0.773(0.508–1.176)
Diabetes (149)	0.037	1.636(1.030–2.599)
Hyperlipidemia (14)	0.640	0.684(0.139–3.360)
Cerebral infarction (66)	<0.001	8.484(4.615–15.597)
Coronary heart disease (76)	<0.001	2.987(1.699–5.252)
Arrhythmia (14)	0.410	1.749(0.463–6.615)
Cerebral hemorrhage (20)	<0.001	15.130(4.707–48.630)
Respiratory system (30)	0.006	3.470(1.428–8.430)
Digestive system (33)	0.510	1.379(0.530–3.590)
Osteoporosis (7)	0.102	5.036(0.724–35.027)
Rheumatic immune diseases (11)	0.705	1.349(0.287–6.347)
Urinary system (17)	0.356	0.527(0.135–2.057)
Psychosocial disease (7)	0.764	0.730(0.093–5.741)
Malignant tumor (32)	0.001	4.576(1.850–11.315)

To further understand the relationship between a single disease and the risk of VTE in the co-existence of multiple diseases, multivariate analysis was performed on the disease subgroups by logistic regression. The results showed that diabetes (OR=1.636 [95% CI, 1.030–2.599], P=0.037), cerebral infarction (OR=8.484 [95% CI, 4.615–15.597], P < 0.001), coronary heart disease (OR=2.987 [95% CI,1.699–5.252], P < 0.001), cerebral hemorrhage (OR=15.130 [95% CI, 4.707–48.630], P < 0.001), respiratory diseases (OR=3.470 [95% CI, 1.428–8.43], P=0.006) and malignant tumor (OR=4.576 [95% CI, 1.850–11.315], P=0.001) were independent disease predictors of VTE high risk patients with multiple diseases, and the risks of VTE from high to low were cerebral hemorrhage>cerebral infarction>malignant tumor>respiratory system disease>coronary heart disease> diabetes. However, others disease were not independent disease predictors of high risk of VTE with multiple diseases. See Table 4 and Figure 1.

Score of VTE Cognitive Level and Factors of Influencing VTE Cognitive Level in Primary Care Outpatients

The average VTE score of most patients in different factors in Shanghai is maintained at 50–60% of the correct rate, suburban and obese patients even less than 50%. Univariate analysis of the cognitive level of VTE in primary care outpatients showed that the table's mean score of urban patients, patients aged <65 years, patients with primary school education or above, patients without chronic disease, non-obese patients, non-smoking patients was higher, meanwhile, there was statistical significance in location (t=3.420, P < 0.001), age (t=6.869, P < 0.001), the degree of education (t= −7.341, P < 0.001), chronic disease (t=5.875, P < 0.001), BMI (t=6.404, P=0.012), smoking (t=4.152, P=0.042). However, sex and disease co-existence was not significant difference, as shown in Table 5.

Table 4 Validity Analysis of Different Influencing Factors on the Cognitive Level of VTE-Related Knowledge Test Score

Variables	VTE Score ($\overline{X} \pm S$)	t value	P value
Gender			
Male	2.693±1.318	1.430	0.153
Female	2.557±1.215		
Location			
Suburban	2.193±1.232	3.420	0.001
Urban	2.466±1.287		
Age (years)			
<65	3.088±1.146	6.869	<0.001
≥65	2.409±1.467		
The degree of education			
Primary school or less	2.437±1.278	−7.341	<0.001
Primary school or above	3.147±1.088		
Chronic diseases or not			
Yes	2.553±1.266	5.875	<0.001
No	3.375±1.047		
Co-existence of multiple diseases			
No	2.486±1.489	−1.210	0.227
Yes	2.612±1.238		
BMI (kg/m^2)			
≥28	2.224±1.351	6.404	0.012
<28	2.663±1.255		
Smoking			
No	2.795±1.239	4.152	0.042
Yes	2.571±1.275		

Discussion

The known risk factors for thrombosis such as surgery, trauma, pregnancy, postpartum period, replacement of fibrinogen concentrate, and causal thrombophilic mutation.[8] In addition, thrombotic complications are present in bleeding disorders, such as congenital hypofibrinogenemia.[9,10] In this study, Primary Care outpatients were taken as the research object to explore their VTE risk factors and the factors affecting their VTE cognitive level. Urban residents with a low VTE risk had a strong ability of self-management of VTE, which may be related to economic conditions in the urban area being good, such as good access to community health care and better chronic disease management. Patients with chronic diseases are more likely to have VTE than those without chronic diseases. Chronic diseases lead to physical discomfort, lack of awareness and excessive worry about the disease, which not only affects the quality of life of the elderly but may increase their psychological pressure, resulting in anxiety, worry and increased feelings of sickness. Xuan et al had similar findings.[11] A lower education level is correlated with a lower degree of self-management. Many of these patients cannot read and can only absorb outside information through spoken words, which means they are unable to understand the community-wide knowledge and cannot read the VTE brochures. In addition, the degree of education is one of the factors influencing negative emotions, people with a higher education level have fewer negative emotions, and health, education, and negative emotions have an interaction effect on the risk of thrombosis.[12]

Patients of different ages have different risks of VTE. The older the patients are, the greater the risk of VTE. The reasons are related to both internal and external factors. On the one hand, increasing age is accompanied by the aging of organs, a serious reduction in exercise and the occurrence of chronic diseases, which directly lead to a further increase in VTE risk. On the other hand, urban elderly individuals mainly rely on themselves for support, and a sufficient economic income is a basic guarantee of the quality of life. Yuanming et al agree with this view.[13] Based on the results of this study,
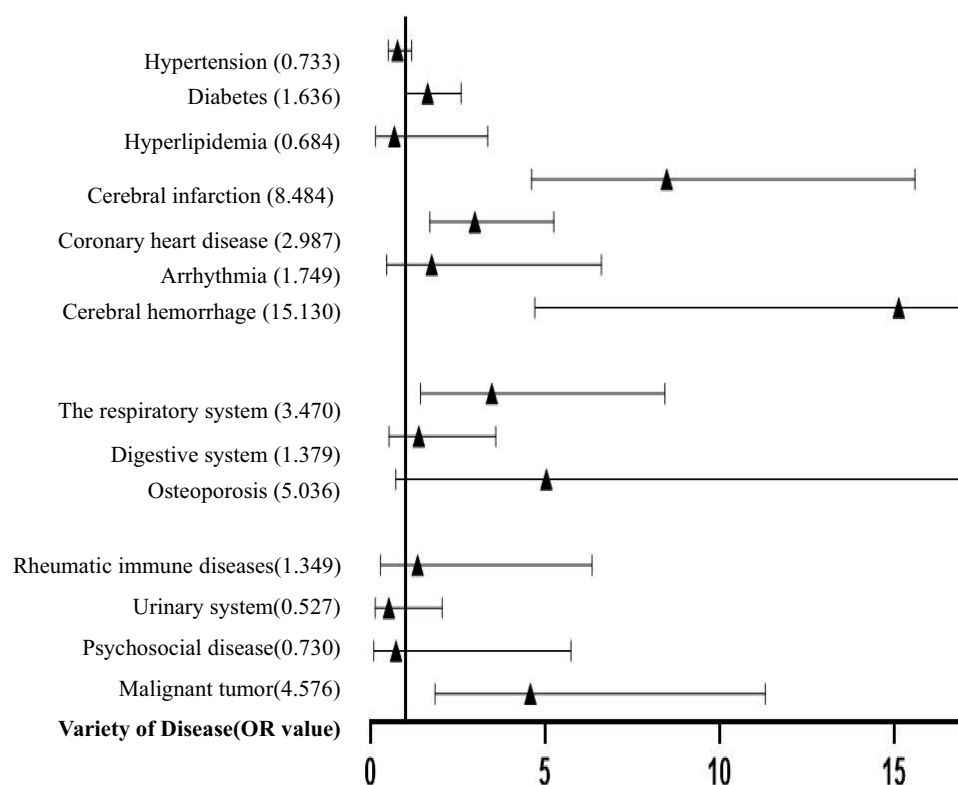
Figure 1 Multivariate analysis of subgroups of chronic diseases.

it is suggested that community hospitals should pay more attention to elderly patients with a variety of chronic diseases. All departments of primary care should jointly hold regular VTE-related publicity lectures and try to educate the community about VTE. At the same time, community staff should visit their patients' homes regularly to provide knowledge about VTE prevention.

Further statistical analysis of the co-existing subgroup of diseases found that central system diseases such as cerebral hemorrhage and cerebral infarction were associated with a higher risk of VTE, which may be related to reduced physical activity and increased bedtime or sedentary time. Malignant tumors are also associated with a high incidence of VTE. Previous studies have found that the mechanisms of tumors complicating VTE include the following: the body of patients with malignant tumors produces pro-coagulant substances due to the tumor, which activates internal and external coagulation systems, leading to hypercoagulability; in addition, the application of hemostatic drugs during the treatment process may increase the hypercoagulability of the body.[14] Malignancy is also listed as a high-risk factor in the 2018 Expert Guidelines for Pulmonary Thromboembolism. Respiratory diseases, such as pneumonia and exacerbations of COPD, can also increase the risk of VTE.

Fever, diarrhea and treatment factors lead to severe nondominant and dominant water loss from the body, causing blood concentration. The release of a large number of inflammatory mediators, as well as the application of glucocorticoids and immunoglobulin in patients with severe or critical conditions, will also lead to hypercoagulability of the blood. Similar findings were also reported by Shi et al.[15]

Myocardial infarction is acute myocardial ischemia caused by coronary thromboembolism. A previous history of myocardial infarction indicates that patients with extreme disorders of coagulation function are at increased risk of VTE. Studies have shown that patients with myocardial infarction are often older, have a variety of chronic diseases, such as hypertension, diabetes, ischemic cerebral hemorrhage, etc. At the same time, myocardial infarction is often accompanied by liver and kidney insufficiency and a bleeding tendency, which further aggravates the risk of VTE.[16]

The incidence of VTE in patients with the co-occurrence of multiple diseases is higher than that in patients with a single disease or no disease. The reasons may be as follows: First, the co-occurrence of multiple diseases increases the

Table 5 Validity Analysis of Different Influencing Factors on the VTE Self-Management Ability Score

Variables	VTE Score ($\overline{X} \pm S$)	t value	P value
Gender			
Male	2.693±1.318	1.430	0.153
Female	2.557±1.215		
Community location			
Suburban	2.193±1.232	3.420	0.001
Urban	2.466±1.287		
Age (years)			
<65	3.088±1.146	6.869	<0.001
≥65	2.409±1.467		
The degree of education			
Primary school or less	2.437±1.278	−7.341	<0.001
Primary school or above	3.147±1.088		
Chronic diseases or not			
Yes	2.553±1.266	5.875	<0.001
No	3.375±1.047		
Co-existence of multiple diseases			
No	2.486±1.489	−1.210	0.227
Yes	2.612±1.238		
BMI (kg/m^2)			
≥28	2.224±1.351	6.404	0.012
<28	2.663±1.255		
Smoking			
No	2.795±1.239	4.152	0.042
Yes	2.571±1.275		

risk of acute cardiovascular and cerebrovascular events and respiratory or circulatory failure in elderly patients. Second, the increased use of drugs by patients with multiple diseases leads to decreased liver and kidney function, disorders of coagulation function, and an increase in blood viscosity. Third, the life of patients with multiple diseases is extremely irregular, and the burden of thought, serious illness, increased bedtime and other reasons may be related.

In addition, the cognitive level of VTE is low in patients in China currently. At the same time, the reduction in cognitive level will all have an impact on the effect of VTE prevention and management in patients and there are few reports on the causes and influencing factors of low cognitive level.[4] In this study of VTE, the cognitive level was investigated through the form of questionnaire. The average VTE score of most patients in different factors is maintained at 50–60% of the correct rate, even less than 50%, which means that patients' cognition of VTE is insufficient in general. The Statistical analysis results showed that factors such as region, age, the degree of education, chronic disease were associated with the cognitive level of VTE. The reason for this may be that the prevalence of community outreach among urban patients is better than that among suburban patients, elderly patients may have a low degree of education and a lack of exercise motivation, and people without chronic diseases may have better self-care knowledge. At present, the publicity of primary care is generally oral or written, which has little effect on patients with low education levels. VTE publicity and education, including identification, prevention and treatment, are largely ignored, affecting these patients' effective management of VTE. This phenomenon means that it is particularly important to improve education about VTE prevention among residents in community outpatient clinics and to actively promote residents to learn about the prevention of VTE. This can fundamentally improve the current situation of community residents' lack of knowledge about the prevention of VTE and improve cognitive level of community outpatient patients at risk of VTE.

This study has the following shortcomings. First, the factors included in the two scales are limited, the broader influencing factors of VTE need to be founded, so it is necessary to expand the sample for further stratified study.

Second, due to the short study time, this study failed to track the influence of different teaching methods on the long-term incidence of VTE among the patients, and patients should be followed up for further in-depth study.

Conclusion

In summary, the investigation and analysis of a number of primary care patients in Shanghai showed that outpatients in different primary care patients had different understandings of VTE, and there were significant differences between urban and suburban areas. Patients with various chronic diseases had higher risk of VTE, and different systemic diseases had different effects on the risk of VTE. Meanwhile, the cognitive level of primary care patients about VTE needs to be further improved. Community medical staffs should actively give suggestions to patients, clearly point out their problems in their living habits, push short-videos about the knowledge of VTE regularly. Community health workers should pay more attention to the risk factors related to VTE and emphasize the dangerousness of VTE when they encounter patients with multiple diseases in outpatient clinics. Ensuring that community outpatients receive scientific, effective and reasonable early interventions for VTE can prevent its progression to post thrombosis syndrome.

Data Sharing Statement

The data of this study can be obtained by contacting the corresponding author upon reasonable request.

Ethics Approval and Consent to Participate

This study was conducted in accordance with the Declaration of Helsinki and was approved by the Chinese clinical trials registry. Trial registration number: ChiCTR1800019789. All patients read the study statement and agreed to complete the questionnaire. This study had received approval from Shanghai Changhai Hospital Ethics Committee. The VTE's scale allows to revise according to the actual situation in Shanghai.

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Disclosure

The authors declare no conflicts of interest associated with this manuscript.

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