Universe Scientific Publishing

ORIGINAL ARTICLE

# Analysis of VTE Multiple Risk Factors and Active Prevention in High Risk Group

**Wei Ni***

Department of Cardiology, The First People's Hospital of Neijiang, Neijiang, Sichuan 641000, China

**ABSTRACT** Deeper understanding of venous thrombosis's risk factors and pathogenesis for patients at high risk group and the patient would be informed the disease risk and be advised of the need to improve the way of life. Strengthening of the hospitalized patients with VTE multiple risk factors for risk assessment and the active prevention are effective in reducing the morbidity and mortality rate of VTE.

**KEYWORDS**
Venous thrombosis
Risk factors
Primary prevention

## 1. Introduction

Venous thromboembolism (VTE) is a clinical common disease, frequently-occurring disease, which include lower extremity deep vein thrombosis (DVT) and pulmonary embolism (PE). VTE patients experienced a fatal PE after termination of anticoagulant probability is 0.19%–0.49%. With the increase of economic development, obesity and an aging population, activity decreases, the extension of time in bed, and tumors, the incidence of chronic diseases such as COPD increases year by year, However, as the further recognition of VTE, hemal wall damage, stagnation of blood flow, blood high condensation state is acknowledged as the venous thrombosis of the three factors [1,3,10]. The three often exist at the same time, restrict each other. Lead to many risk factors for venous thrombosis thus Increase the risk factors for deep vein thrombosis of knowledge and understanding. This will help to improve the clinical diagnosis and reduce the complications and reduce mortality.

## 2. Sex and age

Research shows that the incidence rate of VTE in women is lower than men before the age of 50, which may be related to the level of estrogen in women. Martinelli et al. found that the recurrence rate of VTE was higher in female than male. Studies have indicated that the incidence of venous thromboembolism in women with upper extremity venous thrombosis can be increased by 9 times [2].

The incidence of DVT and PE are increased, which may be due to the increase in age and other diseases. Other diseases are may be the real risk factors of PE and DVT. However, another study of age and VTE recurrence rates showed that the recurrence rate of VTE was not correlated with the age of onset of VTE in patients [4–7].

## 3. Living habits

Limb activity decreased, long-term bed, limb fixation, postural movements (long-distance travel, by plane, etc.), can lead to lower limb muscle massage action disappeared, venous blood flow driving force. A case control study on the risk factors of VTE occurrence in a long-term sedentary population at work. The correlation coefficient between sedentary population and VTE was 1.8. A positive correlation between the time and the incidence of VTE was 10%. With prolonged sitting time to a certain extent with every l hour, the incidence rate of VTE will increase by 20% [8].

## 4. Weight

Currently thinking, obesity is not independent VTE risk factors. The menopausal women's body mass index greater than 30 where the DVT risk increased significantly. The postoperative DVT occurrence rate can be increased 2 times. The reason is that obese people reduce the volume of activities, slow blood flow; right heart pressure too high can lead to blood descent propulsion. It is easy to cause stagnant blood flow and thrombosis as reported by Guan Zhenpeng et al. [9]. Obesity is an important risk factor for DVT, which can make the risk of DVT increased by 3.094 times.


doi: 10.18686/aem.v4i2.1
Received: January 26, 2015; Accepted: February 23, 2015; Published online: April 27, 2015

*Corresponding author: Department of Cardiology, The First People's Hospital of Neijiang, Neijiang, Sichuan 641000, China. E-mail: ni_neijiang277@163.com

**5. Pregnancy or postpartum**

Thromboembolic disease has become one of the important causes of death in pregnant women. From the physiological and anatomical factors, the venous reflux obstruction and blood stasis in the pregnant women can lead to vascular endothelial cell damage, thus lead to thrombosis. In addition, because of the way of the left lower extremity venous return to the inferior vena cava, the right common iliac artery oppression left iliac vein and so on.

Pregnant women in the blood fibrinogen where coagulation factors are factor II, VII, VIII and X. Reduced fibrinolytic activity will decreased free protein S levels, and anti-protein C activity enhancement, so that the blood of pregnant women is in hypercoagulable state. Myometrial and placental decidua which contain rich thromboplastin at birth trauma and birth injury, can make the these active substance release a lot thus increased clotting tendency, resulting in a further increase in the risk of thrombosis. Second, age is more than 35 years old, obesity, smoking, prolific, postpartum hemorrhage and blood transfusion, pregnancy induced hypertension, excessive increase of the uterus (amniotic fluid, combined with uterine fibroids), cesarean section (especially emergency cesarean section), long-term immobilization, cardiac insufficiency, lower extremity varicose and chronic hypertension and other risk factors of VTE [11–16].

**6. Tumors**

Thrombosis is one of the serious complications of malignant tumor, and it is also the cause of death in second patients. The occurrence rate was 5 to 6 times higher than that of non-malignant tumor patients in the general population. Tumor associated thrombosis was Trousseau syndrome. The syndrome includes DVT, pulmonary thromboembolism, dispersion of intravascular coagulation, portal vein thrombosis and arterial thromboembolism, walk superficial thrombophlebitis etc., of which the following limb DVT is most common. Studies have indicated that the most closely related risk factors for tumor patients and thrombosis include tumor type, stage (early stage), location (brain, lung, ovary, pancreas, colon), anti-tumor therapy (chemotherapy, hormone, anti VEGF agents, surgery), other risk factors (brake, VTE family history, past VTE History), coagulation factor Leiden (V 20210A, prothrombin mutation).

**7. Surgery and trauma**

Surgery and fractures are common risk factors for PE. After surgery, the causes of VTE were vascular endothelial injury, long-term immobilization and surgical trauma, etc.. In the operation, the blood volume are insufficient and the tissue factor is released into the blood, which can lead to high blood coagulation state and certain surgical specific requirements to DVT incidence of increased significantly such as laparoscopic surgery. Reversed Trendelenburg position to increase the resistance of blood flow in the veins, hip joint and knee joint by using tourniquet limb. It will impede the venous return and caused blood stasis. At the same time, the operation time, anesthesia time, anesthesia methods are also related to the incidence of VTE. Li Guanghui et al. [17] showed that the incidence of DVT in patients receiving epidural anesthesia was 9.5%, and the incidence of DVT was 26.2%.

**8. Serious department of internal medicine disease**

In the past, hyperlipidemia, hypertension, diabetes, coronary heart disease and other diseases related to arterial thrombosis. It has been confirmed that there is a close connection between the venous thrombosis and the risk factors of venous thrombosis. Chronic cardiopulmonary cerebral vascular disease is one of the main risk factors of PE. Respiratory tract infections were closely associated with VTE. In addition, in Matta [18] research results also indicate that the rheumatoid arthritis patients with PE and DVT incidence rate were higher than those in non-rheumatoid arthritis patient, suggest rheumatoid arthritis is a VTE risk factors. Reported in the literature and anticardiolipin antibody positive patients and systematic lupus erythematosus patients with VTE occurrence rate of 47.57% (49/103) and 25.6% (11/43) respectively. Laboratory indexes in lupus anticoagulant antibody levels were significantly elevated. Protein S and C content decreased significantly. Anticardiolipin antibodies of IgG and IgM were positive for DVT were proportion higher. The relationship between human immunodeficiency virus (HIV) and VTE has also been reported. A survey showed that the incidence of PE infection in patients with HIV was 0.4%, and the incidence of DVT was 1.4%, which was higher than that of patients without HIV infection.

**9. Iatrogenic factors**

With the development of various new clinical diagnoses, treatment technology and the wide application of new drugs, some of the VTE caused by iatrogenic factors has gradually attracted the attention of the clinician. Incidence rate is 3–10% and VTE in general within 6 months after the start of treatment with thalidomide occurred. They speculated that the bolt mechanism may be through effects on vascular endothelial cell function and anticoagulation and fibrinolysis soluble activity and increased risk dish liquid of tumor thrombosis in patients with multiple myeloma tumor patients with VTE. In addition, there were some studies showing that the risk of VTE in patients with sedative and antipsychotic drugs was significantly increased [19]. In addition, in the deep venous set tube using the most common oncology and critical diseases in patients with upper extremity DVT where the proportion of a gradual is increased.

**10. Primary prevention**

Hospitalized patients are often faced with a variety of

VTE risk factors. These risk factors have cumulative effect. Therefore, the VTE risk assessment should be carried out at the time of admission. Researchers at the University of Massachuselrs, who reviewed 1464 patients, evaluated the possibility of DVT by using an impedance analyzer. The results showed that only 11% of the patients with DVT were clinically suspected of high risk factors. The incidence of VTE increased with the increase of risk factors, and when there were 3 high risk factors, it can be increased to 50%. Scholars at local and international have tried to evaluate and monitor the VTE high risk population in the presence of multiple risk factors, which is helpful for early detection and timely diagnosis and treatment. The primary prevention of venous thromboembolism is the prevention of risk factors, which can cause blood to high blood coagulation state, blood stasis and endothelial injury. Basic disease treatment is the first such as the cause cannot be removed to take drugs, etc. [20,21]. There are 3 ways to prevent venous thromboembolism: general prevention, preventive anti-coagulation, and mechanical methods. General preventive measures include appropriate fluid infusion, early bed and lower limb, active and passive activities of the lower limb, which is suitable for almost all hospital population. Mechanical preventive measures include the application of gradient pressure elastic stockings, intermittent pneumatic compression pumps and venous pump. Preventive anticoagulation and mechanical methods are applicable to the patients with indications, and the mechanical method is especially suitable for the prevention of the high risk of venous thromboembolism, which should be considered in combination with prophylactic anticoagulation and mechanical method [22]. In addition, some of the risk factors are to be removed, such as bed, respiratory failure, heart failure, etc. The removal of risk factors is one of the focus of prevention of venous thromboembolism.

In conclusion, the risk factors and pathogenesis of venous thrombosis were further recognized and understood. The prevention and treatment of VTE multiple risk factors in patients with high risk patients were improved.

## References


1. Douketis JD, Gu CS, Schulman S, et. al. The risk for fatal pulmonary embolism after discontinuing anticoagulant therapy for venous thromboembolism. *Ann Intern Med*. 2007;147(11):766—774.
2. Esmon CT. Basic mechanisms and pathogenesis of venousthrombosis. *Blood Rev*, 2009;23(5):225—229.
3. Stein PD, Patel KC, Kalra NK, et al. Deep venoas thrombosis in a General hospital. *Chest*. 2002;122(3):960—962.
4. Heit JA. Venous thromboembolism: disease burden, outcomes and risk factors. *Thromb Haemost*. 2005;3(8):1611—1617.
5. Martinelli I, BucciareUi P, Passamonti SM, et al. Longterm evaluation of the risk cerebral sinus-venous thrombosis. *Circulation*. 2010;121(25):2740—2746.
6. Lussana F, Dentali F, Ageno, et al. Venous thrombosis at unusual sites and the role of thrombophilia. *Semin Thromb Hemost*. 2007;33(6):582—587.
7. Eischer L, Eichinger S, Kyrle PA. Age at first venousthromboembolism and risk of recurrence:a prospectivecohort study. *Medicine(Baltimore)*. 2009;88(6):366—370.
8. West J, Perrin K, Aldington S, et al. A case-control Study of seated immobility at work as a risk factor for venous thmmboembolism. *JR Soc Med*. 2008;101(5):237—243.
9. Zhang LM, Tang HY, Pi HY, et al. Risk factors of deep venous thrombosis after joint replacement. *Nursing research*. 2007; 21(10):2564—2567.
10. Martha LL, Alejandro LL, Vi D, et.al. Development of a clinical Prediction rule for risk stratification of recurrent venous thromboembolism in patients with cancer-associated venous thromboembolism. *Blood*. 2010;12(06):304—306.
11. Li F, Li GH, Chen C, et al. Effects of anesthesia on deep venous thrombosis after total hip arthroplasty. *Chinese Journal of Orthopaedic Surgery*. 2003;11(21):1—2.
12. Prandoni P. Acquired risk factors for venous thromboembolism in medical patients. *Hematology Am Soc Hematol Educ Program*. 2005;458—461.
13. Clayton TC, Gaskin M, Meade TW. Recent respiratory infection and risk of venous thromboembolism: case-control study through a general practice database. *Int J Epidemiol*. 2011;21(5):254—256.
14. Matta F, Singala R, Yaekoub AY, et al. Risk of venous thromboembolism with rheumatoid arthritis. *Thromb Haemost*. *2009*;101(1):134—138.
15. Zan YT, Mohan, Huang X, et al. Study on the correlation between anticardiolipin antibody positive patients with risk factors for thrombosis. *Thrombosis and Haemostasis Journal*. 2006;12(6):252—253.
16. Matta F, Yaekoub AY, Stein PD, et al. Human immunedeficiency virus infection and risk of venous thromboembolism. *Am J Med Sci*. 2008;336(5):402—406.
17. Bennett CL, Sehumock GT, Desai AA, et al. Thalidomide-associated deep vein thrombosis and pulmonary embolism. *Am J Med*. 2002;l13(7):603—606.
18. Wang, Jun PH, Leaf W. Thalidomide in patients with hematologic malignancies induced thrombosis effect of preliminary inquiry. *Thrombosis and Hemostasis*. 2010;16(3):124—126.
19. Parker C, Coupland C, Hippisley-Cox J. Antipsyehotic drugs and risk of venous thromboembolism: nested case control study. *BMJ*. 2010;341(4):245—255.
20. Lai S, Xu F. Clinical analysis of deep venous thrombosis (ICU) in 32 cases. *Journal of Medical University of Chongqing*. 2009;34(4):511—509.
21. Li X. The risk of deep venous thromboembolism in patients with deep venous thrombosis in department of internal medicine. *Chinese Journal of Cardiovascular and cerebrovascular diseases*. 2009;11:901—902.
22. Naeearato M, Chiodo GF, Dennis M, et al. Physical methods for preventing deep vein thrombosis in stroke. *Cochrane Database Syst Rev*. 2010;4(8):19—22.