Thromboembolic Prophylaxis in Hospitalized Patients with Risk Factors: An underemphasized issue?

Hastanede Yatan ve Venöz Tromboemboli Riski Taşıyan Hastalarda Tromboemboli Profilaksisi: Gereken önem veriliyor mu?

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ABSTRACT

Objective: Pulmonary embolism (PE) is frequent among hospitalized patients, with a high morbidity and mortality rate. Although prophylaxis for PE and deep venous thrombosis (DVT) is accepted worldwide and the procedures are routinely applied, prophylaxis may sometimes be ignored in risk groups. The aim of our study was to evaluate the rates of DVT prophylaxis in risk groups among patients hospitalized in our hospital.

Materials and Methods: This cross-sectional study was conducted in January 2008 at Dr. Lutfi Kırdar Kartal Training and Research Hospital. Patients hospitalized in our surgery, orthopedics, intensive care, internal medicine, oncology, plastic surgery, obstetrics and gynecology, pulmonary diseases, neurology, neurosurgery and urology clinics were visited on the same day to evaluate the patients clinically and their medical records. Risk factors for DVT and PE were determined and patients receiving prophylaxis were documented.

Results: For the 275 patients, 134 (48.7%) females and 141(51.3%) males, included in the study, the average length of hospital stay was 8.1±10.1 days. The most frequent risk factors were advanced age (52.0%), immobility (38.9%), history of operation (36.4%), malignancy (28.7%) and obesity (21.1%). Among 170 patients who should receive prophylaxis, only 56 (32.9%) were found to receive prophylaxis. The highest rate of prophylaxis was given by the Orthopedics (84.6%) and the Neurology (60.0%) clinics, followed by the Intensive Care Unit (37.5%). During the study period, no patient was found to receive VT prophylaxis in the Gynecology, Oncology, Plastic Surgery and Urology Departments.

Conclusion: We have found out that in our hospital, the importance of DVT prophylaxis was not fully practiced. Prophylaxis of high

ÖZET

Amaç: Pulmoner emboli (PE), hastanede yatan hastalarda sık görülen, morbidite ve mortalitesi yüksek bir hastalıktır. PE'lerin önemli bir kısmı alt ekstremite derin venöz sisteminden kaynaklanır ve bu derin ven trombozları (DVT) çoğunlukla asemptomatiktir. DVT ve PE proflaksisi tüm dünyada kabul gören, rutin kullanıma girmiş yöntemler olmasına karşılık risk grubundaki hastalara proflaksi uygulamaları ihmal edilebilmektedir. Çalışmamızı, hastanemizde yatan ve risk faktörü taşıyan hastalarda DVT proflaksisinin hangi sıklıkta uygulandığını araştırmak için planladık.

Gereç ve Yöntem: Hastanemizin cerrahi, ortopedi, yoğun bakım, dahiliye, onkoloji, plastik cerrahi, kadın doğum, göğüs hastalıkları, nöroloji, nöroşirürji ve üroloji kliniklerinde yatan hastalar, aynı gün içinde ziyaret edilerek, hem kendileri hem de dosyaları görüldü. DVT ve PE için risk faktörleri saptandı. Proflaksi alması gerekip gerekmediği, 2001 ACCP kriterlerine göre belirlendi. Proflaksi alıp almadığı, proflaksiye kontrendike bir durumu olup olmadığı kaydedildi.

Bulgular: Hastanemizde yatan 275 hasta ziyaret edildi ve dosyası incelendi. Hastaların 134'ü (%48,7) kadın, 141'i (%51,3) erkekti ve yaş ortalamaları 53,09±19 idi. Hastanede ortalama yatış sürelerinin 8,1±10,1 gün olduğu saptandı. En sık saptanan risk faktörleri ileri yaş (%52,0), immobilite (%38,9), operasyon öyküsü (%36,4), malignite (%28,7) ve obezite (%21,1) idi. Proflaksi alması gereken 170 hasta vardı ve bunların 56'sına (%32,9) profilaksi uygulanıyordu. Klinikler ayrı ayrı incelendiğinde, risk gruplarına profilaksi uygulanma oranının en yüksek ortopedi (%84,6) ve nöroloji (%60,0) kliniklerinde bulunduğu, onları %37,5 ile yoğun bakım ünitesinin izlediği görüldü. Kadın hastalıkları ve doğum, onkoloji, plastik cerrahi ile üroloji kliniğinde profilaksi uygulanan hasta saptanmadı.

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risk patients for DVT would decrease the incidence of venous thromboembolism and the associated morbidity and mortality. We believe that the appropriate practice of prophylaxis could only be achieved through education.

Keywords: Hospitalized patients, pulmonary embolism, prophylaxis, thromboembolism

Sonuç: Hastanemizde venöz tromboemboli proflaksisine gereken önemin verilmediğini, risk grubundaki hastalara proflaksi uygulanması ile venöz tromboemboli insidansının ve ona bağlı morbidite ile mortalitenin azalacağını düşünüyoruz. Bunu da eğitimle başarabileceğimiz kanaatindeyiz.

Anahtar kelimeler: Tromboemboli, pulmoner emboli, profilaksi, yatan hasta

INTRODUCTION

Venous thromboembolic disorder is one of the most important health problems worldwide. Because of the delay and difficulty in diagnosis due to the insidious clinical presentation or misdiagnosis of venous thromboembolism (VTE) and high prevalence among hospitalized patients, prophylaxis of this disease have become a point of interest. Currently, it is the main etiological issue for preventable hospital deaths. It is evident that pulmonary thromboembolism (PTE) prevention relies mainly on prevention of formation of deep vein thrombosis. Therefore identification of high risk groups for VTE, duration of hospital stay for increased thromboembolism risk and effective therapeutic options with low risk profile for complications should be emphasized. Appropriate and effective prophylactic treatment cost less and is safer than the treatment of the disease itself, decreasing the incidence of morbidity and mortality.[1]

Placebo controlled studies showed that objectively proven VTE incidence changed between 5% to 15% among acutely hospitalized patients and with appropriate VTE prophylaxis fatal pulmonary embolism frequency decreased by a half to three quarters among these patients.[2] Although there are guidelines recommending the initiation of prophylactic treatment in patients hospitalized with VTE risk, the use of prophylaxis has been reported to be low and inappropriate.[3,4,5]

Present study was designed to assess the frequency of DVT prophylaxis among hospitalized patients carrying a high risk factor for VTE.

MATERIALS AND METHODS

Patients hospitalized for reasons other than pulmonary embolism were visited and their respective medical records were evaluated. Visits were completed in a day. A total of 275 patients in surgery, orthopedics, intensive care, internal medicine, oncology, plastic surgery, pulmonary diseases, neurology, neurosurgery and urology clinics were examined. Patient demographics, clinic and laboratory characteristics, duration of hospitalization, risk factors for DVT and PE were assessed. Requirement of prophylaxis was determined in accordance to 2001 ACCP criteria.[6] The current status and contraindications of prophylactic treatment were also documented.

RESULTS

Two hundred and seventy five patients hospitalized with a reason other than pulmonary embolism were visited and their medical records were evaluated. Of the 275 patients, 134 (48.7%) were females and 141 (51.3%) males. The mean age was 53.09±19 years. The mean length of hospital stay was 8.1±10.1 days. Most common risk factors were found to be older age (52.0%), immobility (38.9%), history of surgical operation (36.4%), malignancy (28.7%) and obesity (21.1%). The risk factors for VTE, total number of risk factors for each patient and rate of prophylactic treatment are presented in **Table I, II**. Among 275 patients, while 170 patients required prophylactic treatment according to the ACCP criteria; only 56 (32.9%) were found to have received prophylactic treatment. For prophylactic treatment, low molecular weight

Table I. Distribution of risk factors among patients with VTE risk

Risk factor	n	(%)
Older age	143	52.0
Immobilization	107	38.9
Operation	100	36.4
Malignancy	79	28.7
Obesity	58	21.1
Congestive heart failure	27	9.8
Fracture	23	8.4
Stroke	17	6.2
Central catheterization	14	5.1
Trauma	12	4.4
Postpartum period	10	3.6
Respiratory failure	7	2.5
History of VTE	5	1.8
OCs-HRT* use	1	0.04

*OC: oral contraceptive, HRT: Hormone replacement therapy

Table II. Number of risk factors among patients with VTE risk and rate of prophylactic treatment

Number of risk factors	VTE* (n)	Required to have prophylaxis (n)**	Having*** prophylaxis (n)	Rate of prophylaxis (%)
1 risk factor	77	21	3	14.3
2 risk factors	61	46	10	21.7
3 risk factors	62	57	20	35.1
4 risk factors	31	30	14	46.7
≥5 risk factors	17	16	9	56.2

*Patients who present a risk for VTE
**Patients required to have prophylaxis: 170
***Patients having prophylaxis: 56

heparin (LMWH) was administered as the method of prophylaxis in all except one patient. In one patient, LMWH was contraindicated and varicose socks were used. A separate analysis of distribution of patients with respect to clinical departments showed that patients in orthopedics (84.6%) and neurology (60.0%) clinics had the highest rate of prophylactic treatment followed by intensive care unit (37.5%). No patient was found to have received prophylactic treatment in obstetrics and gynaecology, oncology, plastic surgery and urology departments. Rate of prophylactic treatment in patients having a risk for VTE is shown in **Table III**.

DISCUSSION

In the present study, we showed that venous thromboemboli prophylaxis was ignored in patients hospitalized with a risk factor for VTE.

Venous thromboembolic disorder is one of the most important health problems worldwide with a high prevalence among hospitalized patients. VTE incidence has been reported as 5-15% in acutely hospitalized patients. Currently, it is the main etiological concern for preventable hospital deaths. With appropriate prophylaxis fatal pulmonary

Table III. Distibution of the rate of prophylactic treatment in patients having a risk for VTE in respect to clinics

Clinic	Required to have prophylaxis (n)	Patients having prophylaxis (n)	Rate of prophylaxis (%)
General surgery	38	11	28.9
Orthopedics	26	22	84.6
Internal medicine	21	5	23.8
Intensive care	16	6	37.5
Neurology	15	9	60.0
Neurosurgery	12	1	8.3
Oncology	11	0	0
Gynecology	10	0	0
Plastic surgery	6	0	0
Pulmonary diseases	10	2	20
Urology	5	0	0
Total	**170**	**56**	**32.9**

embolism frequency has been decreased by 50-75% among hospitalized patients.[2] Appropriate and effective prophylactic treatment costs less and is safer than the treatment of the disease itself.[1] Despite these facts, the use of prophylaxis was reported to be low and inappropriate in many studies.[3,4,5]

Pulmonary embolism is a frequent and preventable cause of death in hospitalized patients. As shown by autopsy studies, 10% of deaths during hospitalization was due to pulmonary embolism.[2] Among the cases of pulmonary embolism 95% originate from deep venous clots in lower extremities and are often asymptomatic. Screening methods are not helpful for high risk patients, therefore commencing routine prophylactic treatment for these individuals is suggested.[7,8] Appropriate prophylactic treatment has been recommended in the guidelines of ACCP.[6,9]

Studies performed at medical and surgical intensive care unit showed that 10% of patients had DVT on admittance to intensive care unit.[7] In another study, DVT incidence was assessed to be 30%.[10] During the time of hospitalization in intensive care unit prolonged immobilization, central venous catheterization or other invasive interventions increase the DVT risk. Similarly, in patients with multisystem trauma, in particular orthopedics trauma, cranial or spinal trauma, incidence of DVT was reported as 50-65%.[7,10] Khaldi et al reported that in the first week of a neurosurgical procedures frequency of DVTs was 84%, increasing to 92% in the second week. They demostrated a lineer correlation between the duration of surgery and DVT development.[11]

In our hospital, 37.5% of the patients hospitalized in intensive care unit were receiving venous thromboembolism prophylaxis. In the study of Kizgin et al., 52.9% of the patients were found to be administered prophylactic treatment in intensive care unit.[5] Keane et al. demonstrated that only 32.9% of patients received prophylactic treatment in internal intensive care unit.[10]

Research showed that, most of the patients hospitalized for symptomatic venous thromboembolism did not have a history of recent operation and that the incidence of fatal pulmonary embolism was higher among patients hospitalized with an acute medical illness compared to surgical patients.[2,12]

There is enough evidence to suggest that VTE prophylaxis is necessary in patients with high medical risk. Nevertheless, previous studies report that only 1/3 of high risk medical patients get VTE prophylaxis.[13] In the study of Panju et al, 54% of the hospitalized medical patients recommended for prophylaxis received pharmacological VTE prophylaxis.[14] Twenty eight percent of medical patients and 67% of surgery patients had prophylaxis in Monreal's study.[15]

Thromboembolic disease incidence was reported with varying rates among patients hospitalized in internal medicine units depending on the type of disease. While VTE risk was found to be 3% among patients without a risk factor, the risk increased to 50% in patients with a previous history of VTE . Massive pulmonary thromboembolism comprises the 4-8% of the etiology of deaths in internal medicine units.[16] Twenty eight percent of internal medicine patients and 35% of surgery patients were found to receive prophylaxis in our hospital.

ACCP guidelines[6] recommend the use of low molecular weight heparin (LMWH) as the risk of thrombocytopenia is lower with LMWH as compared to free heparin. DVT incidence was reported to be decreased by 20% with unfractionated heparin and 30% with low molecular weight heparin as compared to placebo.[7] The most common pharmacological method used in prophylaxis in our hospital was LMWH (98.2%).

In the present study, rate of prophylaxis in high risk hospitalized patients was found to be low (32.9%). In literature, limited use of VTE prophylaxis when it is necessary was shown to be dependent to other factors. Most common causes reported were unawareness of disease and lack of information about the guidelines.[2,17] Complexity of the current guidelines may have an additional role in limited use of prophylaxis. Bergmann et al reported that there is a necessity to improve available guidelines for evaluating VTE risk and providing prophylaxis to hospitalized medical patients.[18] Recent ACCP guidelines for prevention of VTE[19] supports the educational steps that may increase the comprehensibility and awareness of the treatment guidelines. Additionally, lack of official protocols in many hospitals for the prevention of VTE in patients under VTE risk have been reported. ACCP recommends the establishment of these protocols and use of computerized reminder systems. With this approach use of prophylaxis may be increased and subsequently a decrease in the DVT and PTE rates in hospitalized patients would be seen.[2] When results of the ENDORSE (Epidemiologic International Day for the Evaluation of Patients at Risk for Venous Thromboembolism in the Acute Hospital Care Setting) 2006 and 2009 were compared, a significant, 43.9% (p=0.002) increase was found in medical patients, which proves the success of lectures presenting the facts and focusing on the increase in medical prophylaxis during the time period between the two studies.[20]

In conclusion, PTE remains a serious clinical problem. Awareness of risk factors for VTE and commencement of routine prophylaxis in these individuals are important approaches. There is a need for establishment of guidelines to be used by physicians for VTE prophylaxis. We believe that, increasing the awareness of physicians about the importance of VTE prophylaxis in hospitalized patients by education may help to overcome this problem.

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