



ORIGINAL RESEARCH PAPER

Medicine

COORELATION BETWEEN DEEP VEIN THROMBOSIS AND PULMONARY EMBOLISM IN POPULATION OF NORTH INDIA

KEY WORDS: Asian, complication, deep venous thrombosis, prevalence, pulmonary embolism

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ABSTRACT

Aims & Objective: Pulmonary embolism (PE) is the most severe complication of deep venous thrombosis (DVT). There have been very few studies to assess the prevalence of PE in Asian patients. The objective of this study was to define the prevalence of PE in patients presenting with suspected lower limb DVT. **Methods:** A total of 100 consecutive in- and outpatients (53 males, 47 females; mean age, 38 years; age range, 24–54 years) with clinically suspected lower limb deep venous thrombosis (DVT) were enrolled in the study. **Results:** Most patients (83%) presented on an outpatient basis. Swelling of the lower limbs (38%) was the most common presenting symptom of DVT followed by swelling and pain & pain in lower limb. Many patients presented with a combination of symptoms. Additional symptoms suggestive of PE, such as breathlessness, chest discomfort, chest pain and haemoptysis, were found in only 26% patients. Haemodynamic instability (systolic blood pressure < 100 mmHg, poor peripheral tissue perfusion) was evident in 3% patients. **Conclusion:** PE occurs frequently in Indian patients with symptomatic DVT. Increasing awareness will provide us with clearer ideas about the prevalence of venous thromboembolism in Asian countries. Our aim was to collect data, related to PE, on patient's characteristics, clinical outcomes, predictors of mortality in acute DVT.

INTRODUCTION

Venous thromboembolism (VTE) is a phenomenon where there is a development of thrombus in a vein. When this stems from the lower extremities of the body (occurring in more than 90% of patients), (1) it is classified as deep vein thrombosis (DVT). Pulmonary embolism (PE) occurs when a thrombus is removed from its originating point and subsequently transported to the lung. VTE is reported to cause a staggering 900,000 new cases and 300,000 casualties annually just in the USA (2). However, reportedly VTE is significantly less frequent among Asian patients (3).

The prevailing notion that the incidence of VTE in Asians is less than that in the Western population has been disproved by recent studies (4). VTE is not only disabling but also prolongs hospital stay and increases the cost of treatment. Along with myocardial infarction and arrhythmia (due to electrolyte imbalance), PE is one of the commonest causes of sudden unexplained deaths in hospitalized patients (5).

Pulmonary embolism (PE) is the most severe complication of deep venous thrombosis (DVT). Both conditions produce few specific symptoms and signs, hence, clinical diagnosis is unreliable (6). The manifestation spectrum of PE ranges from silent to a massive, sometimes suddenly fatal. Nearly 10% of patients who die of PE do so within 1 hour of the onset of symptoms (7). Few population-based studies have demonstrated an average annual incidence of DVT and PE of 48 and 23 per 100,000 persons, respectively (8).

The detection of silent PE in patients with DVT is of prime importance, especially when outpatient treatment is considered (9). Prompt diagnosis and appropriate treatment of this condition can dramatically reduce its mortality and morbidity. In patients with DVT, a clinical dilemma arises because a large number of patients with PE do not present with the classical symptoms and signs. Due to growing burden of VTE in India and lack of substantial Indian data on characteristics of VTE patients, use of diagnostics tools, prophylaxis, treatment options, and clinical outcomes in VTE, there was a need to collect such data systematically. Our aim was to collect data, related to PE, on patient's characteristics, clinical outcomes, predictors of mortality in acute DVT.

MATERIAL & METHODS

A total of 100 consecutive in- and outpatients (53 males, 47 females; mean age, 38 years; age range, 24–54 years) with clinically suspected lower limb deep venous thrombosis (DVT) were enrolled in the study. Since deep venous thrombosis (DVT) and PE are part of the spectrum of the same

disease (VTE), we looked into the prevalence of PE in patients admitted with DVT. Clearance of the Ethics Committee was taken and informed consent of all the patients enrolled in the study was obtained. Patients were confirmed of the diagnosis of DVT by Doppler ultrasonography; pulmonary embolism (PE) by computed tomography &/or pulmonary angiography.

RESULT

Most patients (83%) presented on an outpatient basis. Swelling of the lower limbs (38%) was the most common presenting symptom of DVT (Table 1). Many patients presented with a combination of symptoms. Additional symptoms suggestive of PE, such as breathlessness, chest discomfort, chest pain and haemoptysis, were found in only 26 % patients. Haemodynamic instability (systolic blood pressure < 100 mmHg, poor peripheral tissue perfusion) was evident in 3% patients.

Table 1. Presenting Symptoms In Patients With Suspected Deep Venous Thrombosis (DVT)

Symptoms	Number(n)
Pain in lower limb	16
Swelling of lower limb	38
Swelling and pain	17
Breathlessness	11
Chest tightness/discomfort	9
Chest pain	5
Haemoptysis	1
Hypotension	3

DISCUSSION

PE is the most common cause of inpatient mortality, and is the leading cause of death. Common risk factors include hospitalisation, cardiac diseases, surgery, cancer and immobilisation; and in women, combined oral contraceptive use, hormone replacement therapy and pregnancy. Approximately a quarter of DVT episodes are unprovoked, that is without an identifiable precipitant (10).

Clinical features of DVT include swelling and pain, pitting oedema, increased warmth and superficial venous dilation of the lower limb. Without prompt recognition and treatment, PE can lead to death in up to 30%. Clinical diagnosis of DVT can be challenging and, furthermore, clinically silent episodes are not uncommon.

Indians appear to have a greater propensity towards developing PE at an earlier age, especially massive PE, and are associated with higher mortality. In this study, we found that the mean age of the Indian population having PE was 38

years as opposed to above 65 years as seen in the Western population (11). Our finding is in accordance with the findings observed in the study by Kamekar DR et al., which is one of the largest studies on VTE from India (12,13). A recent trial in South India also found that the mean age of presentation was 52 years (14). PE should therefore be suspected in any patient with unexplained or new-onset dyspnoea, chest pain, palpitations, syncope, or unexplained hypotension (15). Early detection and prompt treatment are vital to the management of patients with PE (16).

Men constituted 53% in our study, more than those reported from Vellore (48%) (17), but similar to those reported in the ENDORSE (Epidemiologic International Day for the Evaluation of Patients at Risk for VTE in the Acute Hospital Care Setting) study (69%) (18). One of the reasons for this could be significantly high levels of homocysteine (thrombophilia marker) in males as compared to females as reported in an Indian study (19). In our study, 47% of females shows positive results for PE. The reason for this high percentage could be use oral contraceptives and postmenopausal hormone replacement therapy, which are known to be risk factors for thrombosis.

Treatment for VTE is primarily aimed at prevention of clot extension, embolization and symptom relief, with additional long-term aims of minimising recurrence and preventing post-thrombotic syndrome (20). Anticoagulation is the mainstay of treatment and should be initiated at confirmation of diagnosis or when first suspected if there is a delay in diagnostic imaging.

Computed tomography (CT) pulmonary angiography is currently accepted as the investigation of choice for PE diagnosis (21); its increased resolution allows detection of PE to subsegmental levels, in addition to detection of alternate diagnoses, such as, infection or cancer.

DVT complicating hospitalisation has gained increased recognition in recent years and its prevention has been identified as a key patient safety priority. The National DVT Prevention Programme advocates a systematic approach to reducing hospital-associated thrombosis (HAT).

CONCLUSION

Venous thrombosis, comprising deep vein thrombosis (DVT) and pulmonary embolism (PE), occurs with an incidence of approximately 1 per 1000 annually in adult populations (22). Rates are slightly higher in men than women. About two-thirds of episodes manifest as DVT and one-third as PE with or without DVT. The major outcomes of venous thrombosis are death, recurrence, post-thrombotic syndrome and major bleeding due to anticoagulation. Thrombosis is also associated with impaired quality of life, particularly when post-thrombotic syndrome develops (23).

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