

## Deep Vein Thrombosis: An Alarming Condition after Surgery and Chronic Illness

Nitesh Kumar<sup>1</sup>, Vishal Krishnan<sup>2</sup>, Ravinder Kumar<sup>3</sup>, Yashwant Ramawat<sup>4</sup>  
Shatrughan Pareek<sup>5</sup>

### Abstract

Deep vein thrombosis (DVT) is one of the conditions that are for long been under-diagnosed and ignored as one of the utmost cause of morbidity worldwide. Understanding of the pathology and treatment of DVT shows advancement over the years among hospitalized patients. Deep vein thrombosis is a frequent and potentially alarming condition. It is extremely common medical problems that occur isolated or associated with other disease or procedures. Around 10 million cases of venous thromboembolism take place yearly- low, middle and high income countries. The hospitalized associated deep vein thrombosis is the major cause of disability. Major risk factors for thrombosis, other than age, include exogenous factors such as surgery, hospitalization, immobility, trauma, pregnancy and the puerperium and hormone use, and endogenous factors such as cancer, obesity, and inherited and acquired disorders of hypercoagulation. Prophylaxis of Deep vein thrombosis has been identified as the best measures to improve the safety of patients who were hospitalized for longer duration. Most of the problem could be avoided by simple, cost-effective measures. The healthcare professionals should be vigilant about DVT and its management to decline the morbidity and mortality because of DVT.

**Keywords:** Deep vein thrombosis (DVT); Venous thromboembolism; Hospitalized patients.

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### Introduction

Deep vein thrombosis (DVT) is the formation or presence of a thrombus in the deep veins. DVT occurs mostly in the lower extremities and to a lesser extent in the upper extremities. Pulmonary embolism (PE) is an obstruction of the pulmonary artery or its branches by a thrombus (sometimes due to fat or air). The most likely source of thrombus in pulmonary arteries is an embolization from deep veins of the legs. It occurs in one-third of patients with DVT. Prevention of DVT thereby decreases the incidence of PE, a serious and life-threatening condition.<sup>1</sup> Deep vein thrombosis is a frequent and potentially alarming condition.

It is extremely common medical problems that occur isolated or associated with other disease or procedures. For many years the Virchow triad has expound the pathogenesis of Deep vein thrombosis DVT (venous stasis, endothelial damage and increased coagulability). DVT can appear at any age, although it is very common among people over 50 years. In 25% of people DVT can occur with or without symptoms, but in many cases the affected limb become painful, swollen, red, hot and superficial vein it can be distended full of blood that circulates badly. The biggest complication of a DVT is that it could dissolve the clot and travel to the lungs, causing a pulmonary embolism.<sup>2</sup> Deep vein thrombosis (DVT) is one of the conditions that are for long been under diagnosed and ignored as one of the utmost cause of morbidity worldwide. Understanding of the pathology and treatment of DVT shows advancement over the years among hospitalized patients. Comprehension for diagnosis and treatment of this potentially lethal condition remains inadequate. Choosing this research topic objective is to identify DVT risk and available options for diagnosis and treatment.<sup>3</sup> Deep vein thrombosis is a frightening condition which occurs when a blood clot forms in a vein located deep inside

**Author Affiliation:** <sup>1</sup>Nursing Officer, Stoma and wound care clinic, All India Institute of Medical Sciences, Jodhpur 342001, Rajasthan India, <sup>2</sup>Faculty of Nursing, Government College of Nursing, Bikaner 334001, <sup>3</sup>Community Health Officer, National Health Mission, Uttarkashi 249128, Uttarakhand, India. <sup>4</sup>Indian Railway Health Services, <sup>5</sup>Nursing Superintendent, Indian Railway Health Services, Bikaner 334004, Rajasthan India

**Corresponding:** Shatrughan Pareek, Nursing Superintendent, Indian Railway Health Services, Bikaner, Rajasthan 3344004, India.

**Email:** shatrughan.pareek@gmail.com

your body. Deep vein thrombosis mostly occurs in the lower extremities and to a lesser extent in the upper extremities. It is a major preventable cause of mortality and morbidity worldwide.<sup>4</sup> According to Centers for Disease Control and prevention (CDC) Deep vein thrombosis can cause serious illness, disability, and sometime death. The most consequential complication of Deep vein thrombosis happens when parts of the clot breaks off and move towards the lungs through the bloodstream, and cause some kind of obstruction called pulmonary embolism (PE).<sup>5</sup> Venous thromboembolism remains the most preventable cause of death in hospitalized patients and is known to cause significant morbidity with associated health-care expenditure.<sup>6</sup> Venous thrombosis generally involves lower limbs, affecting most frequently calf veins, which are involved in virtually 100% of symptomatic, spontaneous lower extremity DVT. It is believed that the DVT is less prevalent among the Indians and Asians.<sup>7</sup> A total of 41% of central venous catheters (CVC) result in thrombosis of the blood vessel. Deep venous thrombosis is the major thrombotic complication of CVC.<sup>8</sup> Venous thromboembolism comprising of deep vein thrombosis and pulmonary embolism can result in significantly mortality, morbidity, and healthcare expenditure. Approximately, one-third of patients with symptomatic VTE show clinical features of pulmonary embolism, whereas two-third shows DVT alone. Both DVT and PE can be clinically silent and hence not suspected. VTE is not only disabling but also prolongs hospital stay and increases the cost treatment. Along with myocardial infarction and arrhythmias, PE is one of the commonest causes of sudden unexplained deaths in hospitalized patients.<sup>9</sup> Deep vein thrombosis is a major cause of disability and death worldwide. The scientific reviews by world thrombosis steering committee revealed that 10 million cases of venous thromboembolism take place yearly low, middle and high income countries. The hospitalized associated deep vein thrombosis is the major cause of disability. Deep vein thrombosis leads to serious life-threatening result including pulmonary embolism, recurrence of venous thromboembolism, post-thrombotic syndrome and death. 1 in 4 people are dying from condition caused by thrombosis; about 900,000 people in the United States alone are affected by blood clot annually; about 100,000 of those people die.<sup>10</sup> Deep-vein thrombosis and pulmonary emboli are common and often "silent". Therefore, the incidence and prevalence are often underestimated. It is thought the annual incidence of DVT is 800 cases per million with a prevalence of lower limb DVT of 1 case per 1000 population.

In the United States, more than 200,000 people develop venous thrombosis per year; of those, one fourth cases are complicated by PE.<sup>11</sup> Some epidemiological studies have identified several factors that increase the risk of DVT development among patient with thromboembolism. The study had shown a majority of intensive care unit (ICU) patients have one or more risks for DVT, may be the patients are further predisposed to DVT during their ICU stay due to prolonged immobilization, sepsis, and vascular injury from indwelling central venous catheter or other invasive interventions. The cause of DVT may be inherited, acquired or a combination of both. The diagnosis and treatment of DVT are expensive and challenging. DVT may also complicate the duration of disease, but it will run across in the absence of precipitating factors.<sup>12</sup> Venous thrombosis, including deep vein thrombosis and pulmonary embolism, occurs at an annual incidence of about 1 per 1000 adults. The rate increases drastically after age of 45 years, and are slightly higher in men than women in older age. Major risk factors for thrombosis, other than age, include exogenous factors such as surgery, hospitalization, immobility, trauma, pregnancy and the puerperium and hormone use, and endogenous factors such as cancer, obesity, and inherited and acquired disorders of hypercoagulation.<sup>13</sup> Due to severe COVID-19 infection, the high incidence of venous thromboembolic events among the infected population.<sup>14</sup> Acute DVT alone was responsible for the substantial burden of VTE in Indian patients. Bleeding was not the limiting factor for anticoagulant treatment in most patients.<sup>15</sup>

## Discussion

Deep vein thrombosis leads to serious life-threatening result including pulmonary embolism, recurrence of venous thromboembolism, post-thrombotic syndrome and death. All the patients who were admitted in ICU and wards should be screened for the risk of deep vein thrombosis. Based on the presence or absence of these risk factors, patients can be stratified into low, moderate and high risk for deep vein thrombosis. Those patients who were at high risk should receive prophylaxis-both mechanical (intermittent pneumatic compression, elastic graduated compressions stockings, and DVT pump used in bed-ridden patients) and pharmacological measures i.e. low molecular weight heparin (LMWH) as per the ACCP guidelines. Those patients who are at high risk of bleeding or contraindicated for pharmacological thromboprophylaxis such as heparin, LMWH

should receive mechanical prophylaxis only. Prophylaxis of Deep vein thrombosis has been identified as the best measures to improve the safety of patients who were hospitalized for longer duration.<sup>16</sup> Most of the problem could be avoided by simple, cost effective measures. The proper administration of prophylactic regimen by interdisciplinary team can play a major role in affecting the outcome of the high risk patients. Evidence based guidelines for VTE prophylaxis have been available since a long time ago.<sup>17</sup> The American College of chest physicians (ACCP) guidelines recommends prophylaxis for the patients at moderate to high risk of VTE, using mechanical prophylaxis and/or pharmacological prophylaxis. Despite the recommendations of international guidelines, physicians often do not prescribe prophylaxis therapy in high risk situations. It's needed to improve physicians' awareness through training and the implementation of procedures to assess DVT risk during hospitalization, along with the application of evidence based guidelines for DVT prophylaxis and treatment in both medical and surgical patients.<sup>18-19</sup>

### Conclusion:

Deep vein thrombosis is a frightening condition which occurs when a blood clot forms in a vein located deep inside your body. Deep vein thrombosis mostly occurs in the lower extremities and to a lesser extent in the upper extremities. It is a major preventable cause of mortality and morbidity worldwide. The bed ridden patients admitted in hospital is sometimes missed out because of their heavy task or overburdened work which make them unaware about the complication that can arise due to long term admission with severe medical illness and immobilization that may lead to increase the risk to develop deep vein thrombosis which is a life threatening condition.

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