

## Lower Extremity Deep Vein Thrombosis among Intensive Care Patients in Orotta National Referral Hospital, Asmara, Eritrea

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### Abstract

**Background:** Deep Venous Thrombosis (DVT) with Venous Thromboembolism (VTE) is a major health problem with high mortality throughout the world. The patients at risk must be identified and given appropriate prophylaxis in order to decrease the mortality.

**Objective:** To investigate and identify risk factors associated with DVT.

**Design:** A retrospective medical chart review.

**Setting:** Orotta National Referral Hospital, the largest teaching hospital in Eritrea.

**Methods:** Review of medical records of all patients with final diagnosis of DVT between January 2005 and December 2008.

**Results:** Of the 1,110 ICU admissions, 91 (8%) had lower extremity DVT. The mean age of these patients was 50 years and male to female ratio was 0.9 to 1. One or more risk factors for DVT from the following list; associated medical conditions contributed to 23 cases (25%), followed by post delivery(19%), major surgery (15%), malignancy (11%), pregnancy (6%), post trauma (6%), varicose vein (3%) and previous DVT (2%) were identified in 98% of the cases in the study population. Two or more risk factors were documented in 41% of the cases. The maximum number of DVT cases was recorded in the age-group of 30 to 39 years. In the absence of other known risk factors, age of 50 and above was observed as a risk factor in (11%) of the cases. No risk factor was identified in 2% of the cases. None of these patients had received any form of prophylaxis.

**Conclusion:** Like elsewhere in the world, in Eritrea, DVT is a major health problem. Medical, surgical conditions and puerperium are among the most important risk factors identified. Prophylaxis against VTE was highly under utilised by the physicians and was not provided to any of the patients in the study. This study emphasizes the urgent need to implement DVT risk stratification strategy and to provide prophylaxis unless contraindicated.

**Key Words:** Deep Vein Thrombosis (DVT), Venous Thromboembolism (VTE), Pulmonary Embolism (PE), Intensive Care Unit (ICU)

### Introduction

Deep Venous Thrombosis (DVT) is a common preventable health problem associated with high mortality worldwide. The factors that predispose to venous thrombosis were initially described by Virchow in 1856<sup>1</sup> and include stasis, vascular damage and hypercoagulability. The risk for DVT has been reported to be highest, ranging 60 to 80%, in critical care and spinal cord injury patients. Following general surgical procedures, the approximate risk for DVT is 14 to 15%<sup>2,3</sup>. Consequently, pregnant women are more susceptible to Venous Thromboembolism (VTE). The risk of VTE is much higher in a pregnant woman than in a non pregnant woman of similar age<sup>4-6</sup>. Critical evaluation of DVT is very crucial because delay in treatment can cause fatal pulmonary embolism<sup>7</sup>.

Estimates indicate that without prophylaxis, fatal PE occurs in 0.2 to 0.9% of the patients undergoing elective general surgery<sup>3</sup>. Some studies have reported that more than 90% of the patients who were treated for VTE, had one or more recognized risk factors<sup>2</sup>. As signs and symptoms of the VTE are non-specific and may be confused with a variety of other cardiopulmonary conditions, the incidence and mortality rates of VTE are still uncertain. Post mortem studies revealed that the pulmonary embolism was recognized in less than 30% of patients before death<sup>8</sup>. Throughout the world, the VTE is a silent and usually undetected killer. The only effective means to reduce related mortality is to

establish prophylactic measures and prevent DVT in high risk patients<sup>7</sup>.

magnitude of DVT and VTE is not known in Eritrea, but the Health Management Information System (HMIS) in the Ministry of Health documented about 233 cases from all inpatients that were admitted for treatment between 2005 and 2008. Of these, 8 (3.4%) deaths were reported to be associated with lower extremity DVT where fatal PE was likely to be the cause.

DVT is commonly seen in our routine clinical practice. Significant numbers of DVT cases are admitted to Intensive Care Unit for treatment. In the modest opinion and to the best of the author's knowledge, the risk factors associated with DVT are not systematically studied in Eritrea. To address the problem, an attempt has been made to review four years of medical records of all patients discharged from ICU with DVT of lower extremities during the period January 2005 to December 2008.

### Materials and Methods

In this retrospective study, data of all patients with final diagnosis of lower extremities DVT, admitted between January 2005 and December 2008 from Intensive Care Unit, Orotta National Referral Hospital, and the largest teaching hospital in the country were analyzed.

A standardized instrument purpose developed by the author for data collection and formatting was communicated to the collectors, mainly two senior

nursing staff members. The data collectors were trained on how to fill the data collecting format under the supervision of the author.

All medical records filed according to an International Classification codes for DVT were reviewed. A case was accepted if a written hospital discharge diagnosis of DVT was made by the physician. Patient data concerning age, sex, site of DVT and available investigations were filled in the data document format by the data collectors. Further, history of previous DVT, different risk factors such as prolonged immobilization, pregnancy, post delivery, post operative DVT and type of surgery, use of contraceptive pills, related medical illness, obesity, smoking and underlying malignancy were recorded.

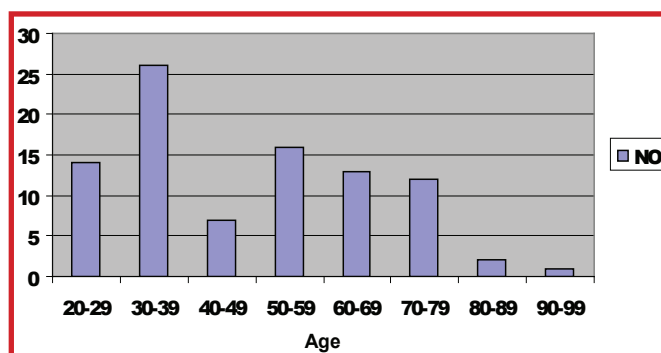
### Results from the study

There were 1,110 acute care admissions of all cases in the Orotta National Referral Hospital during the study period. The patients with clinical diagnosis of DVT admitted for treatment in the Intensive Care Unit of the Hospital were included in this study. The total number of patients with final discharge diagnosis of DVT was 91 (8%). Of these, 42 (46%) were males and the remaining 49 (54%) were females. Male to female ratio was 0.9:1. Confirmed diagnosis by Doppler study was documented in 22 (24%) cases.

All patients with clinical diagnosis of DVT underwent treatment with heparin followed by warfarin. Therapeutic response and final diagnosis on discharge were documented in all. None of these patients had received any prophylaxis against VTE. The annual distribution of the cases is presented in Table 1. Most of the cases were found in the year 2006 and lowest number cases were recorded in the year 2007. The age distribution and associated risk factors of our patients is shown in Table 2 and Figure 1.

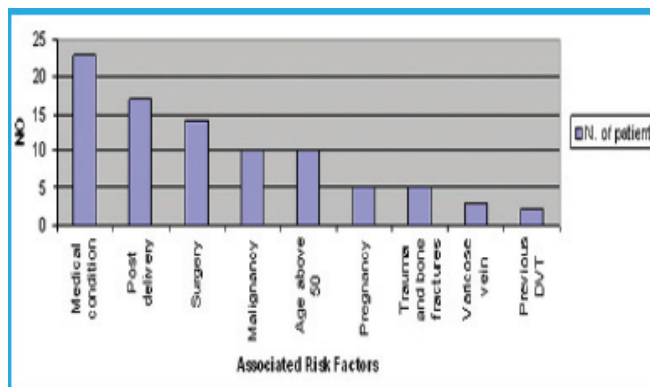
Year	Number of cases	% of cases
2005	26	29
2006	28	31
2007	13	14
2008	24	26
Total	91	100

Figure 1: Age Group Distribution of Patients



The patients' age ranged from 20 to 90 years with a mean age of 50 years. The maximum number of cases was observed in the age group of 30 to 39. Left sided DVT was found in 68 (75%) of cases whereas the remaining 23 (25%) cases were right sided. There was no bilateral DVT case in the present study.

Figure 2: Frequency Distribution of Associated Risk Factors



The frequency of associated risk factors is shown in Figure 2. One or more risk factors were identified in 98% of the cases. Among the risk factors identified, associated medical conditions contributed to 23 cases (25%), followed by post delivery (19%), major surgery (15%), malignancy (11%), pregnancy (6%), post trauma (6%), varicose veins (3%) and previous DVT (2%). In the absence of other known risk factors, age of 50 and above was observed as a risk factor in (11%) of the cases. No risk factor for DVT was found in two (2%) patients.

### Discussion

All of the 1,110 ICU admissions, 91 had lower extremity DVT giving a detection rate of 8%. The mean age of these patients was 50 years. The male to female ratio was 0.9 to 1. Ninety eight percent of patients had one or more risk factors for DVT. Two or more risk factors were documented in 41% of the cases. Left sided DVT was the most common type of presentation

The HMIS estimated the inpatients incidence rate of VTE to be 5 per 10,000 admissions from all health facilities. This study revealed higher incidence rate from Orotta National Referral Hospital where it accounted for 100 per 10,000 admissions. This difference may be explained by that the patients were either referred for treatment to this hospital as Orotta is a National Referral and Teaching Hospital, or may have better diagnostic and specialized services as compared to other Zones. Furthermore, although this ratio cannot predict exactly the population based annual incidence of VTE it indicates its relative frequency in the main National Referral Hospital.

The main findings of the current study are that most of the cases 26 (29%) were in the age group of 30 to 39 years and high susceptibility of women to DVT after delivery. One of the traditions is restriction of movement women after delivery and could explain their susceptibility to DVT in this study. Bed rest or immobility have previously been reported to be risk

factors for DVT<sup>4,5</sup>. Pregnancy and hormone replacement therapy doubles the risk of venous thromboembolism<sup>6</sup>. In this study, post delivery (19%) and pregnancy (6%) were the risk factors in that order but no risk was documented related to contraceptive pills.

Surgery predisposes patients to DVT and PE as late as one month post operatively<sup>2</sup>. Fourteen patients (15%) had developed DVT after major surgical procedures and all were not given any form of prophylaxis. This study shows the need of prophylaxis in patients unless there are known contraindications.

Malignancy related DVT was seen in 11% of the cases, although it has been reported that unsuspected cancer is identified in patients with newly diagnosed DVT<sup>9,10</sup>. Associated malignancies included four with lung cancers, three with colonic cancers, two with breast cancers and one with ocular tumour.

There is an association between increasing age and a higher incidence of VTE<sup>11</sup>. Although DVT can occur at any age, advanced age does increase a person's risk of developing DVT. In the present study, in the absence of other known risk factors, age of 50 and above has contributed to 11% of all DVT cases.

Medical conditions were observed to be frequently associated risk factors in 25% of the patients. Among the common medical conditions documented, ischemic heart disease, hypertension, end stage renal failure and stroke were the leading associated risk factors for the development of DVT.

Smoking and obesity were not documented in a single patient in the study population. As the weight and height was not documented in majority of the patients, assessment of obesity as a risk factor was not possible in the present study.

Recent literature show reports of thrombotic episodes in patients with HIV infection and various abnormalities predisposing to a hypercoagulable state<sup>12,13</sup>. In this study, of the thirty nine patients tested for HIV, 5 (13%) were positive. All HIV positive patients were below the age of 40 and no single patient was on HAART. Mesenteric vein thrombosis is reported in one patient but his status for HIV was negative.

Previous DVT was seen in 3% of the cases. Thrombophilia screening like measurements of protein C, S and anti-thrombin III is recommended for recurrent DVT, but these tests are not available in our laboratory. Doppler ultrasound was used in 24% of the cases for initial diagnosis, although different diagnostic tools are available for the diagnosis of DVT<sup>14</sup>, none of the patients had contrast venography, or impedance plethysmography, as it is not available in our set up.

## Conclusions and Recommendations

This study highlights the significance of detecting associated risk factors to determine high risk patient groups. Prophylaxis against VTE was highly under utilised by the physicians, indeed it was not provided to any of the patients in the study. This study

emphasizes the need to aggressively implement DVT risk stratification strategy and provide prophylaxis unless contraindicated. These findings are anticipated to stimulate more interest in future studies of DVT and VTE. The availability of diagnostic tools would help in the diagnosis of DVT. Further study is needed to define the clinical course, natural history and optimum approach for the work up and management of swollen limbs.

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